GOVERNMENT OF INDIA.

India. METEOROLOGICAL DEPARTMENT.

THE

INDIA WEATHER REVIEW

FOR THE YEAR

1891.

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BY

JOHN ELIOT, M.A.,

METEOROLOGICAL REPORTER TO THE GOVERNMENT OF INDIA.

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September 14, 1999

Corrigenda in the Monthly Weather Reviews for January to December, 1891.

Page.	Month.	Subject.
5	January, 1891 . .	In table in the left column *against* Indus Valley and North-Western Rajputana, mean daily from normal, *for* —0·0 *read* —0·9.
6	Ditto . .	Barometric depressions and cold weather storms, etc., Left column, para. 1, for *Depression storm of January, etc.*, read *Depression and storm of January, etc.*
7	Ditto . .	Right column, para. 4, line 10, *for* '10th' *read* '9th.'
15	Ditto . .	Left column, para. 1, line 2, *omit* 'day.'
16	Ditto . .	Right column. In table at end of para. 2, *against* Bengal and Assam variation from normal of minimum temperature, etc., *for* —0·7 *read* —0·9.
17	Ditto . .	Rainfall, left column. In table at end of para. I, *against* Assam (Surma) normal rainfall, January, *for* 9·47 *read* 0·47.
42	February, 1891 . .	In fourth table, *against* Dinajpur barometer change in preceding 24 hours, *for* —1·40 *read* —·140.
50	Ditto . .	Left column, in table at end of para. 1, *against* Chakrata amount of deficiency, *insert* —4·4.
73	March, 1891 . . .	Right column, line 1, *for* established *read* exhibited.
73	Ditto . . .	Right column, para. 2, line 8, *for* the Central Provinces, East, *read* the Central Provinces East.
77	Ditto . . .	Right column, para. 1, line 4, *for* across the Northern India *read* across Northern India.
77	Ditto . . .	Right column, para. 4, line 2, *for* 18th *read* 19th.
81	Ditto . . .	Weather in the Bay of Bengal, etc., left column, para. 1, line 5, *omit* 7° N. *after* equator.
81	Ditto . . .	Weather in the Bay of Bengal, etc., left column, para. 1, line 10, *for* at *read* off.
82	Ditto . . .	Left column, in heading of table at end of para. 2, *for* variation of mean temperature of month from normal *read* variation of mean maximum temperature of month from normal.
85	Ditto . . .	Right column, line 2, *for* their motion *read* this feature.
109	April, 1891 . . .	Right column, para. 1, line 9, *after* Sind *insert* and at Aden.
109	Ditto . . .	Right column, para. 1, line 11, *for* and Aden, where they are undoubtedly, etc., *read* and at Aden, where they were undoubtedly.
111	Ditto . . .	Summary of the reports of the weather and snowfall, etc., right column, line 5, *for* on the 7th *read* from the 7th.
115	Ditto . . .	Right column in table preceding para. 1, *against* Jacobabad variation of mean temperature of day from normal, *for* +6· *read* +6·1.
117	Ditto . . .	Right column, line 2, *for* N. 81° E. *read* N. 84° E.
142	May, 1891 . . .	Left column, table at end of para. 1, against *Clan Mackenzie* weather, *for* "heavy rain-Squalls," *read* Heavy rain squalls, and against *Hartfield* weather *for* "moderate gale with rain. Squalls," *read* "moderate gale with rain squalls."
142	Ditto . . .	Right column. In table at end of para. 1, *against* 8 P.M., weather, *for* "calm and southerly" *read* "calm and southerly breezes."
142	Ditto . . .	Right column, para. 3, line 3, *for* "depressive area" *read* "depression area."
145	Ditto . . .	Left column, *against* 18th May, line 8, *for* waiting *read* awaiting.

Page.	Month.	Subject.
161	May, 1891 . . .	In Table I, column of rainfall variation from normal of period, *against* Calicut, *for* +4·25 *read* −4·25.
164	Ditto . . .	In Table II, column of Pressure variation from normal, *against* Sibsagar, *for* ·020 ? *read* −·020 ?.
171	June, 1891 . . .	Right column, para. 3, line 2, *for* establish *read* exhibited.
180	Ditto . . .	Left column, in table at end of para. 6, *against* Port Blair, average direction, June 1891, *for* S. 36° W. *read* S. 63° W.
181	Ditto . . .	Left column, in table after line 2, *against* Bombay normal daily air movement, June, *for* 287 *read* 387.
206	July, 1891 . . .	Left column, para. 2, line 31, *for* 44 *read* 45.
212	Ditto . . .	Right column, para. 3, line 5, *for* north-east of the Bay *read* north-west of the Bay.
217	Ditto . . .	Right column, in table at end of the column, *against* Bengal and Assam, variation of mean maximum from normal, *for* 2·5 *read* +2·5.
224	Ditto . . .	Right column, in table at end of para. 3, *against* Punjab South, Total rainfall July 1891, *for* 2·94 *read* 2·90.
225	Ditto . . .	*Omit* para. 4 of right column.
225	Ditto . . .	Right column, para. 5, line 7, *for* "in different parts of the Presidency," *read* "in different parts of the Presidency, based on the rainfall statement of the Bombay Presidency for the month."
225	Ditto . . .	Right column at end of para. 5, *substitute* table thus :—

Meteorological division.	Actual average rainfall of month.	Normal rainfall of month.	Variation from normal.
	Inches.	Inches.	Inches.
Konkan	46·08	39·03	+7·05
Bombay Deccan . .	10·23	7·84	+2·39
Khandeish . . .	11·32	5·67	+5·65
Guzerat	24·89	18·89	+6·00

226	Ditto . . .	Left column, para. 2, line 2, *for* was *read* were.
243	August, 1891 . .	Summary of the chief features of the weather in India, etc., right column, para. I, line 12, *for* storm *read* storms.
244	Ditto . .	Left column, para. 1, line 9, *for* 86½° E. *read* 86° E.
248	Ditto . .	Left column, para. 1, line 20, *for* 9th *read* 10th.
249	Ditto . .	Right column, para. 2, line 2, *for* north-eastern *read* south-eastern.
252	Ditto . .	Left column, para. 2, line 9, *for* west-north-westerly *read* west-north-westwards.
253	Ditto . .	Right column, line 3, *for* had a moderate, etc., *read* had moderate, etc.
256	Ditto . .	Right column in table preceding para. 1, column headed Air movement daily, Per cent, *for* Per cent *read* Percentage increase.
257	Ditto . .	Left column, in table at end of para. 2, *against* Salem, aqueous vapour tension, mean actual, August 1891, *for* ·87 *read* ·687.
258	Ditto . .	Left column, para. 1, line 5, *for* extends *read* extend.
258	Ditto . .	Left column, para. 1, line 6, *for* is hence, etc., *read* are hence, etc.
259	Ditto . .	Left column, below the table, line 3, *for* was *read* were.
260	Ditto . .	Right column, para. 1, line 7, *for* rainfall *read* rainfalls.
260	Ditto . .	Right column, para. 1, line 8, *for* was recorded *read* were recorded.

Page.	Month.	Subject.
262	August, 1891 . .	Left column, para. 1, line 6, *for* relating *read* relative.
271	Ditto . .	Table I, in columns of rainfall of month and of rainfall variation from normal, *against* Jeypore, *for* 2·96 and −7·14 *read* 3·06 and −7·04 respectively.
273	Ditto . .	Table I, in column of wind velocity. Percentage variation, *against* Seoni, *for* 40 *read* −40.
273	Ditto . .	Table I, in column of Hygrometry, 8 A.M., mean vapour tension, *for* ·50 *against* Simla *read* ·507.
282	September, 1891 . .	Left column, para. 3, line 9, *for* night *read* afternoon.
286	Ditto . .	Right column, in table at end of para. 2, position of centre Long. E. *against* 8th *for* 70° 45′ *read* 79° 45′.
291	Ditto . .	Left column, line 1, *for* in Nagpur *read* of Nagpur.
298	Ditto . .	Left column, in table at end of para. 1, *for* station Karu *read* Karachi.
305	Ditto . .	Right column, para. 4, line 2, *for* Bombay, Deccan *read* Bombay Deccan.
320	Ditto . .	Table II in column of pressure variation from normal, *against* Ratnagiri, *for* ·030 *read* +·030.
321	Ditto . .	Table II in column of wind velocity, normal, *against* Secunderabad, *for* 82 *read* 158.
328	October, 1891 . .	Right column, line 1, *for* 5th to the 8th *read* 5th to the 9th.
328	Ditto . .	Right column, line 4, *for* 9th to the 18th *read* 10th to the 18th.
329	Ditto . .	Right column, para. 3, line 11, *for* the loss of three hsips *read* the logs of three ships.
332	Ditto . .	Weather in the Bay of Bengal, etc. Left column, para. 1, line 12, for *Ranore Head* read *Ramose Head.*
344	Ditto . .	Left column, para. 1, line 2, *for* the Madras, Deccan, etc., *read* the Madras Deccan, etc.
344	Ditto . .	Left column, para. 1, line 12, *for* Lat. 1·33° N. *read* Lat. 13° N.
362	November, 1891 . .	Right column, para. 2, line 28, *for* of the 4th *read* of the 5th.
368	Ditto . .	Right column, line 3, *for* Lat. 19½° *read* Lat. 19¾°.
369	Ditto . .	Right column, para. 2, line 3, *for* west of Saugor *read* east of Saugor.
370	Ditto . .	Left column, line 3, *for* 8th *read* 7th.
373	Ditto . .	Left column, para. I, line 3, *for* 24th *read* 21st.
373	Ditto . .	Right column, in table at end of para. 1, barometer *against* SS. *Bhandara*, *for* 9·87 *read* 29·87.
373	Ditto . .	Right column, para. 3, lines 3 and 4, *for* gradient *read* quadrant.
375	Ditto . .	Left column, para. 3, line 8, *for* 5th *read* 6th.
379	Ditto . .	Left column, para. 3, line 13, *for* north-west *read* north-east.
381	Ditto . .	Right column, para. 4, line 9, *for* Bombay, Deccan *read* Bombay Deccan.
398	Ditto . .	In Table II, in column of pressure mean reduced to sea-level, etc., *against* Dhubri, *for* ·899 *read* ·926.
400	Ditto . .	In Table II, column of pressure variation from normal, *against* Mercara, *for* − 049 *read* −·006.
400	Ditto . .	In Table II, column of pressure mean reduced to sea-level, etc., *against* Madras, *for* 895 *read* ·868.
404	December, 1891 . .	Right column, in table at end of para. 4, variation of mean minimum from normal, *against* Burma, Inland, *for* + 2·1° *read* −2·1.
405	Ditto . .	Right column, in table at head mean variation of aqueous vapour pressure from normal, *against* Southern India, *for* +0 27 *read* +·027.
407	Ditto . .	In left column, last line, *for* West Ceylon *read* East Ceylon.

Page.	Month.	Subject.
420	December, 1891 . .	In Table I, temperature of air, variation from normal of mean daily temperature, *against* Mymensingh, *for* 1·9 *read* + 1·9.
429	Ditto . .	In Table I, wind velocity. Percentage variation, *for* 50 *read* + 50.
432	Ditto . .	In Table II, column of pressure variation from normal, *against* Trichinopoly, Cochin, Wellington and Leh, *insert* + before each group of figures.
432	Ditto . .	In Table II, column of temperature of air, mean daily range *against* Vizagapatam and Minicoy, *for* 7·3 and 8·1 *read* 7·2 and 8·0 respectively.
433	Ditto . .	In Table II, column of Humidity variation from normal, *insert* + before each of the figures *against* Salem, Trichinopoly, Wellington and Leh, and — before the figure *against* Cochin.
433	Ditto . .	In Table II, cloud mean daily, *against* Bellary, *for* 4·8 *read* 4·3.
433	Ditto . .	In Table II, column of cloud variation from normal, *against* Secunderabad, Bellary, Salem, Mercara, Trichinopoly and Wellington, *insert* + before each group of figures, and *against* Madras, *for* 0·6 *read* + 0·5 respectively.

GOVERNMENT OF INDIA.
METEOROLOGICAL DEPARTMENT.

MONTHLY WEATHER REVIEW,

PUBLISHED BY ORDER OF

THE GOVERNMENT OF INDIA.

CALCUTTA, JANUARY, 1891.

INTRODUCTION.

THE present is the first monthly report of the weather in India issued as a separate publication by the India Meteorological Department. It is intended to take the place of the Annual Reports on the Meteorology of India, which have hitherto been issued about fourteen months after the termination of the year to which they referred. It is hoped, when the arrangements are complete, that these monthly reports will be published from six to eight weeks after the conclusion of the month with which they deal.

The present monthly report is based on observations taken daily at 8 A. M. at 154 stations, and on additional observations taken at 10 A. M. and 4 P. M. at 82 stations. Arrangements are in progress for giving a monthly summary of the rainfall observations taken at about 2,500 rainfall stations; but in consequence of unavoidable delays, the complete rainfall data for January are not yet available, and this rainfall summary for January is hence based on the rainfall data of the meteorological observatories and the weekly rainfall telegrams sent to Simla by the District officers throughout India. It is also intended to use the meteorological data of the Bay of Bengal and the Arabian Sea, which are collected at the ports of Calcutta and Bombay, so far as is at present possible, in discussing the weather of India. Summaries of the snowfall information received from the District officers of the North-West Frontier and the Himalayan districts will be included in the reports of the cold weather months.

I.—Brief Review of the Meteorology of the year 1890.

As the Annual Report on the Meteorology of India for the year 1890 will not be ready for issue for some months, it appears to be desirable to give a brief sketch of the meteorology of that year as introductory to the discussion of the weather of January 1891 contained in the present review.

The cold weather months of January and February 1890 were unusually free from storms in Northern India, and hence anti-cyclonic conditions with clear dry weather prevailed almost without interruption, and the rainfall was everywhere largely in defect. One storm crossed Northern India from west to east in January, but it gave only local showers in the plains and light snow in the hills. Two depressions advanced eastwards across Northern India in February. They were throughout shallow and feeble depressions and gave moderate rain, chiefly in the Punjab and North-Western Provinces. Unusually dry weather in January and February in Northern India is generally followed by unsettled weather in March, the disturbances being usually of the hot weather type. March 1890 was no exception to the rule. Thunderstorms were of frequent occurrence, and the rainfall of the month was in slight to moderate excess, more especially in Assam and East Bengal. April was slightly hotter than usual, and there were several periods of slight disturbance, during which thunderstorms and duststorms were of frequent occurrence.

These storms were abnormally numerous in the Peninsula and Burma, which hence received larger rainfall than usual. May was very dry everywhere and temperature increased steadily until nearly the end of the month in Upper India, and the highest temperatures of the year were recorded on the 25th of May in Upper Sind. The absolute maximum was 122·5° recorded at Jacobabad on that day. The rainfall of the month was in defect over the whole of India, the deficiency being very considerable in South Madras, Malabar and Mysore. There was a moderate excess in Burma, chiefly due to the rainfall accompanying a cyclonic storm of somewhat unusual character. This storm formed rapidly in the Bay of Bengal near the Andamans on the 4th and 5th and advanced by a curved path across the Arakan Yoma mountains into Central Burma where it filled up on the 9th.

The hot weather conditions of May 1890 were hence very strongly marked. Pressure was on the average of the whole of India ·02″ in defect. Relatively to this state it was locally in defect in North-Eastern India, more especially in Behar and North Bengal, and in the Sub-Himalayan districts of the North-Western Provinces. It was, on the other hand, in moderate excess in North-West and West India. The permanent advance of the monsoon currents in the Arabian Sea commenced on the 27th and 28th May on the Malabar coast. A storm formed in front of the advancing current and gave very disturbed weather with heavy gales for some days in the east and north of the Arabian Sea, and it was not until the 16th and 17th of June that the monsoon current marched rapidly across the head of the Peninsula and Central India, and was fully established in Upper India. Southwest winds prevailed over the Bay from the commencement of June, but they were feeble until the 17th when a rapid increase occurred accompanying the formation of a cyclonic storm in the north of the Bay. With the advance of that storm from the Bay across Chutia-Nagpur into Bundelkhand on the 19th and 20th the Bay of Bengal current was established over Northern India. The monsoon currents hence extended over the whole of India from about the 20th of June and were unusually steady during the remainder of June and in July and August. In June the rainfall was generally in excess. It was exceptionally heavy in North Bengal and also in a portion of Guzerat where a local cyclonic storm on the 19th and 20th gave rainfalls varying from 20 to 30 inches in amount at several stations. The rainfall of July was above the average in all districts except Guzerat and some parts of Southern India. It was most excessive in North Bengal and Behar (which received 50 per. cent. above their normal) and the North-Western Provinces (where it was on the average 40 per cent. in excess). The monsoon currents received their greatest extension in August and gave unusually heavy rain in Upper India and steady rain over the whole of Northern and Central India. There was a moderate deficiency in Burma, Ceylon, Berar, Khandeish and the greater part of the west coast districts (especially Malabar). The excess was, relatively to the normal, greatest in the West Punjab (90 per cent.), Behar (50 per cent.) and North Bengal (25 per cent.). Hence the rains up to the end of August were unusually abundant over the greater part of the country, more especially in North Bengal, Behar and the North-Western Provinces. They were approximately normal or slightly in defect in Burma and the Peninsula. A longish break followed in the beginning of September which continued until the 12th or 13th. Two depressions advanced from the Bay during the last fortnight of the month and gave general and moderately heavy rain to North-Eastern and Central India, and moderate rain to the Peninsula.

The weather conditions became more and more abnormal during the last three months of the year. Temperature was below the normal in October over the whole of Northern and North-Western India. Pressure was in slight defect in Northern India and the Bay area, and in excess in the Peninsula (more especially Bombay and the West Deccan) and the adjacent portions of the Arabian Sea. Three depressions formed in the Bay, but they did not develope to any extent and were throughout feeble cyclonic storms. The first advanced to the coast of the Circars, the second to East Bengal, and the third to South Madras. Bengal, Assam and Chutia-Nagpur received somewhat larger amounts of rain than usual, the greater part being due to the second storm of the month. The rainfall was in defect in all other districts. The deficiency was most serious in Berar, the Central Provinces, Khandeish, Konkan and Malabar. Berar, for example, received an average of only 0·2 inch, the normal average being 3·3 inches. Similarly the Konkan had 0·76 inch and the Central Provinces 0·42 inch, the normal amounts being 3·81 inches and 2·35 inches respectively. The very deficient rainfall in these areas appears to have been due almost exclusively to the more rapid retreat than usual of the Arabian Sea southwest monsoon current in September and the beginning of October, so that it practically gave no rain to the western districts of the Peninsula after the second week of the month. The rainfall in Madras, Hyderabad and Mysore was slightly below the average, but the deficiency was small in amount except in the Nellore, Arcot and Chingleput districts.

During the first half of November weather was slightly unsettled in the Peninsula, and moderately heavy rain was received in the whole of Madras except the most southern districts, the Bombay coast districts, Mysore, Hyderabad, Berar and the Central Provinces. This was followed by a short period of fine weather lasting from the 14th to the 18th over the whole of India. Fine settled weather continued until the end of the month in North-Eastern India and the Peninsula, but weather was more or less disturbed with

frequent rain in North-Western India, more especially in Beluchistan, Afghanistan and the West and North Punjab. The mean temperature conditions of the month varied little from the normal. Temperature was in moderate excess except in North-Eastern India where it was nearly 1° below the normal. The chief change in the pressure conditions in October and November was the development of a low pressure area over the whole of North-Western India, whilst pressure remained high in the Peninsula and increased relatively to the normal state in North-Eastern India. These unusual pressure features in November accompanied a large excess of rain in the West Punjab, which received an average of 1·65 inches, the normal being 0·26 inch, and a moderate deficiency over the greater part of the Peninsula. The Carnatic, more especially the eastern districts, received much less than the normal amount in consequence of the sudden and untimely cessation of rain on the 14th. It received an average of 5·15 inches during the month which is barely half its normal amount (10 inches). The chief feature of the month was undoubtedly the exceptionally heavy rain in Upper India, which accompanied the cessation of the rains of the north-east monsoon (or retreating south-west monsoon) in the coast districts of Madras and Southern India generally.

The weather during the whole of December was similar to that of the last twelve days of November. It was unusually disturbed in North-Western India, and two well-marked depressions advanced eastwards from Beluchistan across Upper India. They gave unusually heavy rain to Sind and the Punjab. Thus the West Punjab obtained an average of 3·6 inches, and the East Punjab and Sind each of 1·4 inches, the normal averages being 0·3 inch, 0·5 inch, and 0·1 inch, respectively. Showers fell in Southern India and Ceylon during the first week of the month, but practically no rain fell during the remainder of the month in Southern India. Burma and Bengal were almost rainless during the month. The deficiency in the Carnatic was even more marked in December than in the preceding month. It received an average of 0·85 inch, the normal being 4·1 inches. The drought was most severe in the North Coromandel coast districts, more especially Nellore and Chingleput, and in certain portions of the Tinevelly district of South Madras, and affected the crops most seriously, so that they failed to a very large extent in these districts.

Temperature was, on the whole, below the normal in Upper India, in December, but was very considerably above it in the Peninsula. The excess was greatest in the Central Provinces and Berar, where the mean of the month was 5¼° above the normal mean. There was, on the other hand, a remarkable deficiency of temperature in Burma, chiefly due to the unusual dryness of the air which favoured nocturnal radiation and gave much lower night temperatures than usual, whilst the day temperatures were above the normal to a moderate extent. The mean minimum temperature of the month was nearly 7° below the normal in Central Burma.

The mean pressure of the whole of India for December agreed almost exactly with the normal. There was, however, a large local excess in the centre and south of the Peninsula, as shown by the following data :—

Station.	Barometric Anomaly.	Station.	Barometric Anomaly.
Ratnagiri	+·041″	Salem	+·034″
Cochin	+·049″	Negapatam	+·039″
Bellary	+·036″	Madura	+·039″

Pressure was, on the other hand, relatively to the general state, more or less deficient in Northern India, the deficiency being greatest along the base of the Himalayas from Rawal Pindi to Sibsagar. The following table gives data :—

Station.	Barometric Anomaly.	Station.	Barometric Anomaly.
Rawal Pindi	—·023″	Patna	—·030″
Ludhiana	—·026″	Dhubri	—·023″
Roorkee	—·023″		
Lucknow	—·022″	Sibsagar	—·032″

The following were hence the chief features of the weather conditions in India at the end of the year 1890—

(*a*) Although the mean pressure of the whole of India was practically normal, there was a steady tendency to excessive pressure in the Peninsula, and to deficient pressure in North-Western and Northern India. The former had been a marked feature for the previous three months. The latter feature was not prominent in October, but developed in November and was very marked in December.

(*b*) The south-west monsoon had retreated from the centre and south of the Arabian Sea in the beginning of October, and the current in the Bay of Bengal was feebler and more irregular than usual in October and the first half of November, and apparently retreated southwards and was absorbed in the Equatorial zone of low pressure in the middle of November, as practically no rain fell in the Carnatic and South India after that date.

(*c*) Conditions were very abnormal in Upper India and very favourable for a severe winter in the hill districts and for abundant rain in the plain districts of the Punjab, Sind, Rajputana, the North-Western Provinces and Behar. The first marked indication of these abnormal features was exhibited in October. The rainfall increased in intensity in November and December and was excessive in Upper India in the latter month, and the snowfall in the Kashmir Himalayas and Afghanistan during this period was abnormally heavy.

(*d*) Temperature was steadily below the average in Northern India, but was excessive in the Peninsula. The excess was shewn as largely in the night as in the day temperatures over a large part of the area. This feature was most strongly exhibited in the Central Provinces and Berar, where the mean daily temperature at the end of December was nearly 10° above the normal. In Burma the weather was characterized by unusual dryness and by very low night temperatures.

II.—Summary of the chief features of the weather in India during the month of January 1891.

It has been pointed out in the previous section that the cold weather of 1890-91 commenced unusually early in October 1890, and that there was frequent rain or snowfall in the hills to the north and west of the Punjab during the months of November and December 1890. This, taken in conjunction with the facts that the snowfall in the Himalayan area had been much below the normal during the previous three years, and that the snow accumulation in the higher elevations was very deficient, appeared to indicate that the winter of 1890-91 would probably be exceptionally severe.

The month of January was unusually disturbed over the whole of North-Western India and the adjacent hill districts. This was chiefly due to the advance of a number of storms of the cold weather type across Northern India, the tracks of which were further north and nearer to the Himalayas than is generally the case in January. The most important of these storms were those occurring between the 7th and 10th, the 15th and 19th, and the 22nd and 25th. The second of these storms was a double disturbance, a second depression appearing in North-West India, whilst the first was advancing across Northern India, and both depressions apparently filled up simultaneously. The first of the three storms gave light to moderate rain to Upper India. The second gave a very heavy burst of rain to the greater part of Northern India, and exceptionally stormy weather and very heavy snowfall to the Western Himalayas and the Afghan mountain ranges. The third storm was accompanied by moderate rain, chiefly in North-Western India. These storms gave much cloudy and gloomy weather to the Punjab, Sind, Rajputana, Central India, the North-Western Provinces and Behar during the earlier stages of their existence; but when they advanced into Bengal, the skies cleared, and the depression in that area merely modified the winds and temperature for brief periods and failed to give cloudy or unsettled weather.

Weather was, on the other hand, even more settled than usual in the Peninsula, and no rain fell over by far the greater part of the whole area south of latitude 20° N.

Each of the storms of the month was accompanied by large and marked temperature changes. A warm wave advanced in front of each storm and a cool dry wave followed. The changes of the mean daily temperature accompanying the passage of these storms were sometimes very large in Upper India, exceeding 15° and 20° in amount. The daily range of temperature was also largely influenced. In front of each depression cloudy and dampish weather obtained, and hence the range of temperature was small, as the effect of these conditions was to reduce the day or maximum temperature below the normal, and to raise the minimum or night temperature above it. On the other hand, in the rear of the storm where the air was unusually dry and clear, the night temperature was reduced largely below the average, whilst the day temperature was normal or above it. The month was hence characterized in North-Western and Central India by frequent large and rapid changes of temperature conditions. The variations of the mean temperature of the month from the normal were, on the whole, less than might have been expected. In North-Eastern India (Bengal, Assam, and Burma), and in the Peninsula (*i. e.*, south of latitude 20° N.), where skies were even freer from cloud than usual, and little or no rain was received, the mean day temperature was more or less above the normal and the mean night or minimum temperature below it. The following gives a brief summary of the temperature variations for these areas:—

Meteorological Province.	Meteorological District.	Variation of Mean maximum from normal.	Variation of Mean minimum from normal.	Variation of Mean daily from normal.	Variation of Mean daily range from normal.
North-East India.	Burma Coast	+1·5	—0·2	+0·7	+1·7
	Burma, Inland	+1·7	—2·5	—0·4	+4·2
	Assam	+1·5	—0·5	+0·5	+2·0
	Bengal and Orissa	+0·9	+0·4	+0·7	+0·5
Peninsula	Deccan	+0·6	—0·9	—0·1	+1·5
	West Coast	+0·6	—1·3	—0·3	+1·9
	South India	+1·2	—0·5	+0·4	+1·7

These figures shew that the variations were largest and most marked in Upper and Central Burma, where the daily range of temperature was 4·2° on the average of the month above the normal.

The temperature conditions in North-Western India were mainly determined by the unusual amount of cloud which prevailed during the month. The effect of increased cloud and rainfall in Northern India during the cold weather is to diminish the day temperature and increase the night temperature. These results were not obscured in January (as they were in the following month of February) by the snow accumulation in the Himalayan area. The following gives

a brief summary of the temperature variations in North-Western India for January :—

Meteorological Province.	Meteorological District.	Variation of Mean maximum from normal.	Variation of Mean minimum from normal.	Variation of Mean daily normal from normal.	Variation of Mean daily range from normal.
North-Western India.	Indus Valley and North-Western Rajputana	—3·9	+2·1	—0·9	—6·0
	Upper Sub-Himalayas	—3·1	+0·8	—1·2	—3·9
	Gangetic plains	—0·2	+0·4	+0·1	—0·6
	East Rajputana, Central India and Guzerat	—0·2	—0·3	—0·2	+0·1

The temperature variations due to increased cloud, and rainfall were, as might be expected, most marked in Sind and the Punjab. In Central India, Rajputana and the North-Western Provinces, the conditions were practically normal as they lay between the two large areas of opposite temperature conditions and variations, *viz.*, North-Western India and North-Eastern and Southern India.

The winds during the month were, on the whole, steadier and stronger than usual, and the mean directions differed little from the normal. Very stormy winds prevailed in the hill districts during the second disturbance of the month.

The variations of the humidity and amount of aqueous vapour were less than might have been expected considering the unusually disturbed weather and large rainfall in Northern India. Each of the storms gave rise to a slight or moderate increase of aqueous vapour to the east and north of the storm area and in the storm area itself. The increase was most marked in the areas of rainfall but was only shown for a brief period. With the setting in of the west or north-west winds in the rear of each depression a very rapid and large reduction of the amount of aqueous vapour present in the air, occurred. In consequence of the large number of storms during the month, the changes of humidity were larger and more frequent than usual. The only areas in which the air was much damper than usual were the Indus Valley (where the mean humidity of the month was 14 above the normal), and the Upper Sub-Himalayan area (where it was 11 above the normal mean of the month). The air was, on the other hand, somewhat drier than usual in Burma, the Deccan, and West Coast districts. It was, on the other hand, slightly more humid in Southern India.

Notwithstanding the amount of disturbed weather the cloud amount was below the normal over the whole of India and Burma, except in the Indus Valley (1·4 above), the Upper Sub-Himalays (0·5 above) and the hill districts of Northern India (0·6 above). The deficiency of cloud was greatest in the West Coast, Burma, Bengal and Orissa, and the Gangetic valley, where it ranged from 1·0 to 1·5. The following gives the mean variations of the aqueous vapour pressure, humidity and cloud amount from the normal in the large meteorological divisions of India :—

Division.	Mean variation of Aqueous vapour pressure from normal.	Mean variation of Humidity from normal.	Mean variation of Cloud amount from normal.
Burma Coast	—·023	—4·8	—1·1
Burma, Inland	?	?	?
Assam	+·004	—0·7	—0·7
Bengal and Orissa	—·009	—1·9	—1·1
Gangetic plain	+·005	+1·6	—1·0
Upper Sub-Himalayas	+·035	+11	+0·5
Indus Valley	+·053	+14	+1·4
East Rajputana	—·006	+1·0	—0·3
Deccan	—·033	—3·8	—0·8
West Coast	—·040	—4·0	—1·4
South India	+·025	+3·5	—0·7
Hill Stations	+·005	+0·6	+0·6

The most remarkable features of the month were the excessive snowfall which was received in the Western Himalayas and Afghan highlands, the heavy rainfall in North-Western India, and the almost entire absence of rainfall in North-Eastern India and the Peninsula. Burma, Bengal (except the western districts), the greater part of the Deccan, the west coast districts, and North Madras received practically no rain (with the exception of a few local showers of no importance). In Assam an average of barely a quarter of an inch fell, the normal average amount being about $\frac{8}{10}$ths of an inch. On the other hand, the rainfall of the month was more or less largely in excess in Sind, the Punjab, Rajputana, the North-Western Provinces and Behar. It was very irregularly distributed in Central India, but on the average of the whole of that area the rainfall was approximately normal. The rainfall was most excessive in the North and East Punjab and in South Behar where from upwards of three times the normal amount was received. The following gives a brief statement of the rainfall data for North-Western and Central India :—

Meteorological Province.	Mean Actual.	Mean Normal.	Variation, of actual from Normal.	Percentage variation.
	Inches.	Inches.	Inches.	
Upper Sub-Himalayas	3·25	1·66	+1·59	+ 96
Indus Valley and North-Western Rajputana	1·31	0·64	+0·67	+105
Ganjetic plain	1·23	0·67	+0·56	+ 84
Eastern Rajputana, Central India and Guzerat	0·63	0·40	+0·23	+ 57

The snowfall was excessively heavy in the Kashmir and Punjab Himalayas and in the Afghan mountain ranges. For example a total of 13½ feet of snow fell at Murree. The snowfall reports received shew that the depth of snow lying at the end of the month in the passes in Kulu and Lahul was much greater than at the same period of the past four or five years. No snowfall reports have been received for the Eastern Himalayas, but so far as is indicated by the returns from the adjacent plain stations, it is probable that the snowfall has been less than usual.

Atmospheric Pressure.

The distribution of mean 8 A.M., pressure for January is shown by means of two charts. The first chart (Plate I) gives the distribution of the mean pressure of the month reduced to sea-level, and to constant gravity (that of Latitude 45°) by means of isobars drawn for differences of pressure of ·05″ or $\frac{1}{20}$th of an inch. The second chart (Plate II) gives the variations of the actual mean pressure from the normal pressure. These values are obtained from the barometric readings reduced for temperature only. A small chart No. 4 of plate III gives the distribution of the monthly mean daily pressure and of the mean winds in the same form and manner as in the monthly charts given hitherto in annual reports on the meteorology of India. The data on which this chart is based are given in Table II. The more important barometric changes and movements during the month are fully given in the following statement of the barometric depressions of the month.

The data that are chiefly used in this discussion are the 8 A.M., reduced observations and the variations derived from a comparison of these observations and the normal values given in Table I. The means in the third column are not only reduced or corrected to sea-level, but also to constant gravity. The normal means are obtained from the observations of the period 1878-88, and in order that the means and variations may be strictly comparable, the means have been calculated for observations of the same period in all cases.

Notwithstanding the large and rapid variations of pressure which accompained the numerous depressions and cold weather storms of the month, pressure was generally above the average by moderate amounts. The mean pressure of the month for the whole of India was ·005″ in excess of the normal. Relatively to this general state, there was a slight to moderate deficiency in North-Eastern India and along the base of the Himalayas, and probably over the Himalayan region to the east of Roorkee. This local deficiency was small and unimportant except in Assam, East Bengal and Burma. The following gives the negative anomalies exceeding ·02″ in amount :—

District.	Station.	Negative Anomaly.
Assam	Sibsagar	—·030
	Silchar	—·010 (?)
East Bengal	Dacca	—·030
Burma	Akyab	—·031
	Rangoon	—·038
	Diamond Island	—·038

Pressure was locally in slight to moderate excess in North-Western and Central India and the Peninsula. The positive anomalies were small, except in the two areas represented by the following stations :—

		Positive Anomaly.
West Punjab and Upper Sind.	Peshawar	+·024
	Rawal Pindi	+·027
	Mooltan	+·029
	Jacobabad	+·026
Central and Western India.	Indore	+·026
	Khandwa	+·030
	Poona	+·020
	Ratnagiri	+·022

Barometric Depressions and cold weather storms of the month.

(1) *Depression storm of January 7th to 10th.*—The weather at Bushire on the Persian Gulf was unsettled between the 2nd and 6th. The barometer was very unsteady, and frequent showers fell, giving a total of 3·27 inches of rain during this period. There was, however, no cyclonic shift of wind at that station, the wind directions varying irregularly between north and east. It is hence very probable that the present depression did not advance as a cyclonic storm across Persia. The barometer was fairly steady and high in India at the commencement of the month and marked anti-cyclonic conditions prevailed. It began to fall on the 5th, the fall being most rapid in North-Western India. Gradients were very small on the 6th and winds light and unsteady in Northern India. Nine out of eleven plain stations and the hill stations of Quetta and Murree reported calms on the morning of the 6th. The observations of that date indicate that a shallow depression was forming in or advancing across Afghanistan, as the barometric changes of the previous 24 hours were greatest at the following stations :—

Station.	Barometer.			Cloud amount.	Wind.	
	Actual corrected to sea-level and constant gravity.	Change in preceding 24 hours.	Variation from normal of day.		Direction.	Average velocity during previous 24 hours in miles per hour.
Peshawar	30·125	—·061	—·019	1	Calm	1
Rawal Pindi	30·121	—·050	—·026	0	Do.	1
Dera Ismail Khan	30·119	—·030	—·017	4	Do.	1
Quetta	...	—·057	+·003	3	Do.	0

These observations of the 6th appear to establish that the disturbance was at this time small and of little importance. The barometer fell during the next 24 hours over the whole of Burma and India, with the exception of Malabar and Konkan, but the changes were small except in North-Western India, where they slightly exceeded ·05″. The following gives data of the 7th for the stations where the fall was greatest :—

	Station.	Barometer. Actual corrected to sea-level and constant gravity.	Barometer. Change in preceding 24 hours.	Barometer. Variation from normal of day.	Cloud amount.	Wind. Direction.	Wind. Average velocity during previous 24 hours in miles per hour.
Plain stations.	Rawal Pindi	30·044	—·077	—·075	10	NE	2
	Peshawar	30·062	—·063	—·061	10	ESE	2
	Lahore	30·071	—·053	—·046	2	Calm	1
Hill stations.	Quetta	...	—·023	—·014	4	Calm	2
	Murree	...	—·027	+·019	10	SSE	9
	Simla	...	—·016	—·024	10	N	?
	Leh	...	—·064	...	8	E	0

The preceding observations suggest rather the formation of a disturbance in the north of the Punjab than the advance of a well defined depression from Afghanistan. The large increase of cloud in the Punjab and at the Punjab hill stations and the increasing force of the winds at Murree (more especially when compared with Quetta) indicate that the slight disturbance was increasing in intensity. The isabnormals at this time in Upper India were nearly parallel to the North-West Frontier, and suggest the formation in the West Punjab, West Sind and adjacent districts of Afghanistan and Beluchistan of a long shallow trough of low pressure. The barometric changes of the next 24 hours were large and significant. They are given for certain stations in the following table, the observations of which establish that a deepish depression covered the south-east of the Punjab on the morning of the 8th :—

	Station.	Barometer. Actual corrected to sea-level and constant gravity.	Barometer. Change in preceding 24 hours.	Barometer. Variation from normal of day.	Cloud amount.	Wind. Direction.	Wind. Average velocity during previous 24 hours in miles per hour.
Plain stations.	Sialkot	29·944	—·118	—·145	9	W	2
	Lahore	29·946	—·125	—·161	10	N	3
	Ludiana	29·876	—·193	—·215	9	W	1
	Sirsa	29·897	—·208	—·207	3	WSW	4
	Delhi	29·942	—·160	—·158	9	NW	2
	Roorkee	29·922	—·177	—·162	10	W	1
Hill stations.	Quetta	...	+·019	+·014	0	Calm	3
	Murree	...	—·158	—·134	10	ESE	21
	Simla	...	—·158	—·178	10	SSE	?
	Leh	...	—·250	...	10	Variable	0

The most striking fact in these observations is the very large fall of the barometer at the hill stations and more especially at Leh, where it was actually greatest, although that station is at an elevation of nearly 12,000 feet above sea-level. Skies had cleared during the previous 24 hours in the South-West Punjab and Beluchistan, but were overcast in the East Punjab and adjacent hill districts. Light to moderate rain averaging 0·2 inch had fallen in the Punjab and light to moderate snow in the hills during the previous 24 hours.

The depression was transferred to the east-south-east during the next 24 hours, and was in Behar and the eastern districts of the North-Western Provinces at 8 A.M. of the 9th. Its position is fixed by the following observations :—

Station.	Barometer. Actual corrected to sea-level and constant gravity.	Barometer. Change in preceding 24 hours.	Barometer. Variation from normal of day.	Cloud amount.	Wind. Direction.	Wind. Average velocity during previous 24 hours in miles per hour.
Hazaribagh	29·939	—·114	—·128	0	SW	5
Patna	29·933	—·088	—·159	0	S	1
Benares	29·878	—·135	—·209	0	ENE	3
Allahabad	29·942	—·064	—·151	0	Calm	4

The depression was now filling up and was of little importance. Winds were very light in Bengal, Behar and the North-Western Provinces, and continued to blow from north-east or east on the Bengal coast. There was still much cloud in the Punjab, but skies were, as hitherto, clear in the eastern districts of the North-Western Provinces and Behar. With the exception of a few light local showers in the Punjab, no rain had fallen in Northern India during the previous 24 hours. The barometer increased rapidly during the day in North-Eastern India (*i.e.*, in the eastern districts of the North-Western Provinces, Behar, Bengal and Assam), and the depression completely filled up before 8 A.M. of the 10th.

The disturbance was hence a comparatively feeble one. It cannot be decided from the observations whether it originated in the North-West Frontier districts or passed across Afghanistan and Beluchistan as a very shallow and insignificant depression, and entered India as a long and narrowish belt or trough of low pressure. In either case the disturbance developed rather rapidly on the 7th, and was a fairly well-defined depression on the morning of the 8th. It advanced eastwards and filled up on the afternoon and evening of the 10th in North-Eastern India A most important feature of the cold weather storms which enter North-Western India from Beluchistan and Afghanistan is that they are usually extremely feeble and shallow depressions before entering India, but that they occasionally develop rapidly under varying conditions in Northern India into important and deep depressions, and are then attended with very heavy rain and snow in Upper India. This

appears to be mainly due to the fact that, when crossing Persia and Beluchistan they are maintained by a comparatively dry upper current which has passed over the extensive land region of Northern Africa and Arabia; whereas after they enter India, the upper south-west or west-south-west current over the Arabian sea begins to feed into them. This is a comparatively moist current and hence modifies the character and conditions of the storm. It is probable the present disturbance was an example of this class of storm.

(2) *Depression and storm of January 15th to 19th.*—Fine clear weather prevailed for some days after the disappearance of the previous depression over the whole of India with the exception of the Punjab where skies continued to be more or less clouded. The barometer rose steadily and rather rapidly in North-Western India and was considerably above its normal height on the 12th. The excess was greatest in the Indus Valley between Peshawar and Jacobabad where it averaged a sixth of an inch. No important change occurred until the 14th, when pressure began to give way over the whole of India, the fall being greatest in the Indus Valley. This fall immediately preceded the appearance of the second cold weather storm of the month. The following observations for 8 A. M. of the 15th indicate the character of the incipient disturbance on that date :—

	Station.	Barometer. Actual corrected to sea-level and constant gravity.	Barometer. Change in preceding 24 hours.	Barometer. Variation from normal of day.	Cloud amount.	Wind. Direction.	Wind. Average velocity during previous 24 hours in miles per hour.
Plains of Upper India.	Peshawar	30·131	—·139	+·013	8	SSW	2
	Dera Ismail Khan	30·131	—·116	+·014	2	SW	1
	Mooltan	30·135	—·108	+·033	5	NNW	1
	Jacobabad	30·109	—·117	+·033	7	SE	1
Hills of Upper India.	Quetta	...	—·064	+·043	8	Calm	3
	Murree	...	—·054	+·050	8	ESE	3
	Simla	...	—·044	+·009	1	ENE	?
	Leh	...	—·018	?	8	Calm	0

The following table gives the average cloud amount at 8 A.M. of the 14th and 15th, and the average velocity of the air movement during the 24 hours preceding each of these dates in five provinces of Northern India :—

Province.	Wind Velocity in miles per hour. Normal January.	Wind Velocity in miles per hour. Actual 14th.	Wind Velocity in miles per hour. Actual 15th.	Cloud amount. 8 A.M. 14th.	Cloud amount. 8 A.M. 15th.
Punjab	1·9	2·0	2·7	1·5	5·2
Sind	6·3	11·0	9·7	1·0	5·7
Rajputana	4·1	2·7	2·5	0·5	2·0
North-Western Provinces	2·3	3·7	4·3	0	0·6
Behar	2·0	2·7	3·0	1·3	0

The preceding data shew that at this time the air movement was feeble and differed little from the normal and that cloud was forming rapidly in Upper India. No rain fell on the 14th in Northern India.

The barometer fell rapidly on the 15th, and a deepish depression overlay the Punjab on the morning of the 16th, the centre of which was near Montgomery. The following data shew the character and position of the disturbance—

	Station.	Barometer. Actual corrected to sea-level and constant gravity.	Barometer. Change in preceding 24 hours.	Barometer. Variation from normal of day.	Amount of cloud.	Wind. Direction.	Wind. Average velocity during previous 24 hours in miles per hour.
Plain stations, Upper India.	Jacobabad	29·825	—·284	—·245	10	NW	4
	Mooltan	·814	—·321	—·277	10	NW	1
	Montgomery	·780	—·350	—·320 ?	10	E	8
	Lahore	·844	—·271	—·237	10	E	2
	Khushab	·809	—·310	—·290 ?	10	Calm	1
	Dera Ismail Khan	·821	—·310	—·278	10	Calm	1
Hill stations, Upper India.	Quetta	...	—·248	—·204	10	Calm	3
	Murree	...	—·241	—·186	10	SE	17
	Simla	...	—·108	—·099	10	SE	?
	Leh	...	—·230	?	5	Variable	0

These observations shew that a rapid development of the disturbance had taken place in the Punjab during the previous 24 hours, and indicate that this was not due to the advance of a deep depression from Afghanistan and Beluchistan but to the intensification of the depression which had commenced to form in the preceding day in the Punjab itself. The fact that the fall of the barometer was almost the same in amount at Leh and Murree as at Quetta (the distance of these two stations from Quetta being approximately 700 and 500 miles respectively) appears to establish that the disturbance was a very extensive one, and that it affected the atmosphere to a very great height and that the sphere of condensation and of the chief development of the storm was in the higher strata and atmospheric currents. The average air movement in the Punjab, Sind and Rajputana during the previous 24 hours was actually less (about 5 per cent.) than on the 14th. Skies were now very heavily clouded in Upper India. The cloud amount had increased to 10 (overcast) in the Punjab, to 8·0 in Sind and to 7·2 in Rajputana. Moderately heavy rain had fallen in the Punjab and Sind, and some snow at Quetta and Murree. The weather was becoming very stormy with unusually strong winds in the Punjab Himalayan districts.

The barometric changes during the next 24 hours and the distribution of pressure on the morning of the 17th

were complicated and indicated that there were now two centres of disturbance and two independent areas of low pressure. The first, the centre of which was near Roorkee, was almost certainly the continuation of the disturbance of the 16th. The following gives data for this depression :—

	Station.	Barometer. Actual corrected to sea-level and constant gravity.	Barometer. Change in preceding 24 hours.	Barometer. Variation from normal of day.	Amount of cloud.	Wind. Direction.	Wind. Average velocity during previous 24 hours in miles per hour.
Plain stations.	Meerut	29·874	—·112	—·178	10	S. E.	8
	Roorkee	·838	—·162	—·213	8	S. E.	10
	Dehra Dun	·859	—·147	?	9	S. E.	3
	Ludhiana	·903	+·003	—·176	9	S.	7
	Lahore	·867	+·023	—·216	3	S. E.	9
Hill stations.	Mussooree	...	—·045	?	10	E.	?
	Chakrata	...	—·065	?	10	?	15
	Simla	...	—·142	—·262	10	S.S W.	?
	Leh	...	—·238	?	10	?	0

These observations shew that at the level of the plains the greatest fall of the barometer and the lowest pressure was at Roorkee. The winds at 8 A.M., were, however, comparatively light over the area of depression and were from south-east at all stations, thus showing that at the level of the plains there was no definite cyclonic circulation. The most remarkable fact is the much larger fall of the barometer at Leh than at any other station, further proving that the chief seat of activity of this storm was at a very great elevation. The absence of a well-marked cyclonic circulation in this depression was in part at least due to the appearance of a second depression on the North-West Frontier. The barometer had again fallen in Beluchistan and the South-West Punjab and had risen slightly at Lahore and other stations in the area between the two depressions.

The following gives data of this second depression at 8 A.M. of the 17th :—

	Station.	Barometer. Actual corrected to sea-level and constant gravity.	Barometer. Change in preceding 24 hours.	Barometer. Variation from normal of day.	Amount of cloud.	Wind. Direction.	Wind. Average velocity during previous 24 hours in miles per hour.
Punjab and Sind plains.	Peshawar	29·836	—·023	—·273	10	NE	8
	Dera Ismail Khan	·800	—·021	—·302	8	Calm	1
	Mooltan	·780	—·034	—·317	0	SE	2
	Jacobabad	·824	—·001	—·251	0	Calm	9
Hill stations.	Quetta	...	—·059	—·262	3	Calm	5
	Murree	...	—·122	—·305	10	?	38

The weather was now exceedingly stormy in the hill districts, and the Murree observer telegraphed that a tremendous snowstorm was raging at that station. Stormy weather with strong winds prevailed over the whole of the Punjab, Rajputana, and the western districts of the North-Western Provinces, and very heavy rain had fallen over the greater part of that area. An excessively heavy fall of snow occurred over the whole of the Punjab Himalayas at this time, as indicated by the snowfall reports given in the next section.

Rain continued to fall for some hours after 8 A.M., of the 17th in Upper India, after which the barometer began to rise with unusual rapidity, and before 8 A.M. of the 18th both depressions had completely disappeared, and marked anti-cyclonic conditions with fine weather, light winds or calms and clear skies were again established over Northern India. The following data shew the character of this change :—

	Station.	Barometer. Actual corrected to sea-level and constant gravity.	Barometer. Change in preceding 24 hours.	Barometer. Variation from normal of day.	Amount of cloud.	Wind. Direction.	Wind. Average velocity during previous 24 hours in miles per hour.
Hill stations.	Quetta	...	+·268	+·018	0	Calm	1
	Murree	...	+·273	—·030	5	ENE	17
	Simla	...	+·179	—·058	0	ESE	?
	Leh	...	+·135	...	10	W	1
Plain stations.	Peshawar	30·240	+·404	+·116	3	Calm	4
	Lahore	·221	+·354	+·126	0	Calm	4
	Roorkee	·196	+·358	+.106	0	Calm	7
	Jeypore	·230	+·276	+·084	0	W	5
	Jacobabad	·237	+·413	+·170	0	NW	2
	Mooltan	·239	+·459	+·142	0	NNE	1

The barometer continued to rise on the 18th and on the morning of the 19th was abnormally high, and the highest pressures of the month were recorded in Upper India on that day. The following gives the highest readings of the barometer reduced to sea-level :—

Station.	Barometer. Actual corrected to sea-level and constant gravity.	Barometer. Variation from normal of day.
Peshawar	30·334	+·211
Mooltan	·306	+·217
Jacobabad	·323	+·264

The following points appear to be worthy of notice in connection with the preceding storm—

1st.—The Bushire observations appear to indicate that a disturbance similar in character but much less intense affected Southern Persia two or three

days previously to the present disturbance. The following gives these observations :—

	Barometer.		Wind direction.	Rainfall.
	Actual corrected to sea-level and constant gravity.	Change in preceding 24 hours.		
January 12th . . .	30·067	—·044	E	...
" 13th . . .	·073	+·006	SE	...
" 14th . . .	·046	—·027	SE	2·52
" 15th . . .	·248	+·202	NW	Nil.

2nd—The Leh observations indicate that the barometric movements during this disturbance were greater at that station than at any other hill station, and that the fall of the barometer during the storm was absolutely greater there than at the plain stations in India.

The following table gives the barometric data of Leh during this period :—

Month.	Date.	Hour.	Actual barometer reduced for Temperature.	Change since 10 A.M. of previous day.	Approximate variation from mean of period.
January . .	14	10 A.M.	19·822	+·032	+·148
" . .	15	"	·804	—·018	+·130
" . .	16	"	·574	—·230	—·100
" . .	17	"	·336	—·238	—·338
" . .	18	"	·471	+·135	—·203
" . .	19	"	·722	+·251	+·048

The fall and rise of the barometer during this disturbance, so far as it can be determined by observations taken at a fixed hour daily, are given for a number of stations in Upper India in the following table in order to show approximately the amplitude of the barometric oscillation during the storm :—

	Quetta.	Murree.	Leh.	Peshawar.	Mooltan.	Lahore.	Roorkee.	Jacobabad.
Total fall of the barometer from 14th to 17th.	—·371	—·417	—·486	—·434	—·463	—·369	—·242	—·402
Total rise of the barometer from the 17th to 19th.	+·348	+·359	+·386	+·498	+·526	+·389	+·353	+·499

These figures shew that the barometric movement was greater at Leh than at Murree and greater at Murree than at Quetta. The total fall of the barometer at Leh was also greater than at any plain station in Upper India. The full significance of these figures rests mainly on the facts that Leh is at an elevation of nearly 12,000 feet (11,532 feet) and is separated from the Punjab plains by a barrier of mountains, upwards of 150 miles in width, the higher ranges of which exceed 20,000 feet in elevation. The atmospheric disturbances and movements of Northern India are consequently not limited to India by the mountain mass of the Himalayas but affect the districts to the north of the Himalayas, and they do this because the atmospheric disturbances of the cold weather usually originate and move in the middle and higher strata of the atmosphere. In this respect, as in several others, the storms of the cold weather are entirely different from those of the rains.

This storm was an interesting one in many respects. The evidence is, on the whole, in favour of a depression having advanced eastwards, across Persia and Beluchistan from the latitude of Bushire (on the 13th) to the south-west Punjab (on the 16th). It was, howéver, a feeble storm until it entered the Punjab, when it developed rapidly and advanced eastwards to the Gurhwal or North-West Provinces Himalayas, near or over which it apparently broke up. During the period that it increased rapidly in intensity, an exceptionally heavy fall of snow was received in the Western Himalayas and heavy rain in the Punjab. The observations at Murree and Leh establish fully that the storm was essentially one of high elevation, and that its development in the Punjab was almost certainly due to the influx, at a high elevation, of a moist upper current from the south or south-west, as in the previous storm, and that the condensed vapour was deposited as snow or rain to the north and east of the storm area, the higher elevations on the southern flank of the Himalayas receiving the largest amounts.

Depression and storm of January 22nd to 25th.—The barometer fell continuously on the 19th, 20th and 21st, the fall being as usual greatest in North-Western India and decreasing in amount eastwards and southwards. In consequence of these changes pressure was very uniform in Northern India on the morning of the 22nd and light winds and calms generally prevailed. Skies gradually clouded over in Northern India during this period. The following average data illustrate the steady gradual increase of the cloud amount :—

Province.	Average cloud amount at 8 A.M. of the			
	19th.	20th.	21st.	22nd.
Punjab	0	3·1	3·6	9·1
Sind	2·0	0·7	6·7	10·0
Rajputana	0	0·2	6·5	7·2
Central India	0	0	0·8	0·5
North-Western Provinces . .	0·8	3·4	2·9	5·9
Behar	0	0	0	1·3
Hill Stations, Upper India . .	1·0	4·4	5·4	9·8

The preceding data show clearly the gradual development of cloud with the fall of the barometer. Some

light local showers had fallen in the Punjab during the 24 hours preceding 8 A.M. of the 22nd, but there was as yet no definite depression in Upper India, shewn by the actual distribution of pressure, although a shallow one was indicated by the isabnormal. During the next 24 hours a remarkable change occurred. Heavy rain fell over the Punjab, the North-Western Provinces and Rajputana, and light rain in Sind, the largest amounts being received in the districts near the Punjab Himalayas. The barometer fell most rapidly in Sind on the 20th and in Rajputana on the 21st, and the isabnormals suggest that a very shallow but extensive depression was passing eastwards through Sind and Rajputana on these days. The barometer fell rapidly in this area, and a depression was formed which was deepest at 8 A.M. of the 23rd at Sutna and Allahabad.

The following data shew the position and character of the depression at that hour :—

Station.	Barometer.			Cloud amount.	Wind.	
	Actual corrected to sea-level and constant gravity.	Change in preceding 24 hours.	Variation from normal of day.		Direction.	Average velocity during previous 24 hours in miles per hour.
Allahabad	29·915	—·129	—·127	10	ENE	6
Lucknow	·966	—·084	—·082	10	NE	4
Cawnpore	·897	—·119	?	10	NE	5
Jhansi	·935	—·083	—·105	8	NNW	4
Saugor	·907	—·062	—·113	5	SW	7
Sutna	·893	—·127	—·155	10	S	8

These observations establish that a shallow depression, the centre of which was probably a little to the south-east of Cawnpore was now passing eastwards through the central and eastern districts of the North-Western Provinces and the adjacent districts of the Central Provinces. It was almost certainly the continuation of the very shallow depression which had crossed Sind and Rajputana during the previous 48 hours. The following gives the corresponding observations of the hill stations in Northern India :—

Station.	Barometer.			Wind.	
	Change in preceding 24 hours.	Variation from normal of day.	Cloud amount.	Direction.	Average velocity during previous 24 hours in miles per hour.
Murree	—·034	—·096	9	Calm	3
Simla	—·122	—·190	10	Calm	?
Leh	—·076	?	10	Calm	0
Chakrata	—·134	?	10	E	5
Ranikhet	—·075	—·064	10	E	5

Moderate rain had fallen during the previous 24 hours in the Punjab, Sind, Rajputana, Oudh and the western districts of the North-Western Provinces. Thunderstorms and hailstorms were reported by many stations.

The observations up to this stage hence appear to indicate that the disturbance entered India as a very shallow but somewhat extensive disturbance, which gave very little rain until it reached Central India and Rajputana, when the storm received a considerable development which accompanied a general moderate rainfall, largest in amount to the north and north-east of the central area of depression and in the neighbourhood of the hills.

The 8 A.M. observations of the 24th show that the disturbance had advanced eastwards during the previous 24 hours and was then in Central Bengal. The barometer had risen very rapidly in North-Western and Central India and had fallen moderately in Central Bengal.

The following observations indicate the position and character of the disturbance at this time :—

Station.	Barometer.			Cloud amount.	Wind.	
	Actual corrected to sea-level and constant gravity.	Change in preceding 24 hours.	Variation from normal of day.		Direction.	Average velocity during previous 24 hours in miles per hour.
Dhubri	29·981	—·095	—·040	10	E	11
Mymensing	·948	—·098	?	6	Calm	3
Bogra	·952	—·084	?	10	Calm	3
Jessore	·969	—·067	—·048	0	Calm	3

Unusually heavy rain had fallen in Behar and Chutia-Nagpur, and light to moderate rain in North and Central Bengal, the North-Western Provinces, and the East Punjab. At Patna 2¼ inches were registered, and at Gya 1¾ inches. The preceding observations show that the depression was much shallower than on the previous day, and that the air motion was very slight.

The barometer rose during the next 24 hours in Northern India, the rise being greatest in Central Bengal for which it averaged nearly a tenth of an inch, but a slight fall in Burma indicated that the depression continued to advance eastwards at the same time that it was filling up. There is no evidence of its existence in the observations of the 25th.

The disturbance hence passed from Beluchistan and Sind on the 21st, into Rajputana on the 22nd, the eastern districts of the North-Western Provinces on the 23rd, Central Bengal on the 24th and Upper Burma on the 25th, and hence advanced across Northern India with a fairly regular motion of about 450 miles per diem. It was of little importance except for a period of about 36 hours on the 22nd and 23rd, when its intensity was considerably and temporarily increased during a period of moderate rainfall extending over a large part of Northern India, and of moderate snowfall in the Himalayan area.

Anti-cyclonic conditions were re-established in Northern India on the 26th, on which day fine clear weather with light westerly winds generally prevailed in Northern India. Skies were clouded, and the weather was somewhat unsettled in the Punjab. The barometer fell in that area on the 27th, and light showers were received chiefly in the northern districts. Weather was fine with a rising barometer on the 28th, but pressure began to give way generally on the 29th and decreased steadily on the 30th and 31st, the fall being greatest on the North-West Frontier.

The history of the storms of the month has hence established the following :—

1st.—That cold-weather storms or shallow depressions in probably the majority of cases enter North-Western India from Beluchistan and Afghanistan and, in some cases at least, are the continuation of disturbances which have passed through Persia.

2nd.—That these storms are essentially storms of high elevation, that is, are primarily disturbances originated and propagated in the upper atmospheric strata, or in the west-south-west to west current which blows steadily in the higher strata during the winter months over Northern India, Beluchistan, Arabia, and probably Northern Africa.

3rd.—That these depressions are frequently very feeble and of little importance, merely giving rise to moderate cloud and some light local showers in Upper and Central India. Occasionally, however, they have a large development in Upper India. In such cases the development almost invariably accompanies heavy rain in the submontane districts of Northern India, and heavy snow in the Western Himalayas, and is directly related to this rainfall.

4th.—This development appears to depend upon an indraught of air from the Arabian Sea in the higher strata, which is much more humid than the west-south-westerly winds over the tropical belt in Persia, Beluchistan, Arabia and North Africa.

5th.—The primary depressions which enter India from Beluchistan usually travel across Northern India on an easterly or east-south-easterly track, with an average velocity ranging from 400 to 500 miles, and probably slightly less than that of the higher atmospheric current, in which they drift or are carried forwards.

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

The following gives a summary of the information received respecting the snowfall of the month of January :—

1. *Khyber and Tirah Hills, Peshawar District.*—The Deputy Commissioner of Peshawar states that there was an unprecedentedly heavy fall of snow in the Cherat Range and the Kohat Pass Hills. After a period of heavy and continuous rain in January snow fell at Loargi in the Khyber Chora Barn and the Bazaar valleys on two different occasions. The first fall at Loargi and on the Shenwaree Hills measured 33 inches, and the second (on the 26th) 18 inches. The Deputy Commissioner adds that the winter was very severe and trying in the Khyber Hills, and that so heavy a snowfall has not been heard of before, even by the oldest men living in that district. He also states that according to reports received from Tirah, snow fell on the Tirah Hills on two occasions in January. The first fall measured 6 feet and the second about 4½ feet.

2. *The hills adjacent to the Yusafzai Sub-division of the Peshawar District.*—The following gives the snowfall on these hills in January 1891 :—

Name of hill.	Height.	Amount of snowfall.	
		Feet.	Inches.
Maha Ban Hills	...	15	6
Bagooch	...	4	0
Ban	...	2	6
Tanga	...	1	0
Nal	...	1	6
Sakra	...	4	6
China Tangi	...	1	0

3. *Kohat.*—There was heavy snow on the adjacent mountains. The following gives the depth of snow which fell on the 15th, 16th and 17th on the mountains named below :—

Samana mountains	8¾ feet.
Forghor mountains	8 „
Hangu village	½ foot.

(Hangu village is less than 2,000 feet above sea-level.)

4. *Murree.*—The snowfall at Murree was exceptionally heavy. The observer telegraphed that: "a terrible snowstorm with very heavy gale prevailed on the 16th." The following gives the snowfall at that station during the month:—

	Snowfall. Feet.	Inches.
January 7th	0	6
„ 11th	1	0
„ 16th	8	0
„ 17th	2	0
„ 22nd	1	6
„ 27th	0	8
giving a total of	13	8

5. *Kashmir.*—The Chief Engineer of the Kashmir State writes that nearly 12 inches of rain fell between the 20th January and 3rd of February at Domel, and says it is most unusual and indicates that very heavy snow must have fallen in the neighbouring mountains.

6. *Kangra.*—The information from this district is very limited, but appears to show that the snowfall was heavier than usual in January.

7. *Kulu.*—The Extra Assistant Commissioner in charge of the Kulu Sub-division sends the following statement of the depth of snow on the higher peaks and passes in Kulu on the 25th January:—

District.	Name of pass.	Height above sea-level.	Reported depth of snow.	Reported depth on the same date of preceding year.
		Feet	Feet.	Feet.
Kulu	Rotang	13,000	15	8
	Hamta	14,500	18	6
	Chandar Khani	?	14	7½
	Barsai	?	11	3
	Bujadhar	?	13½	?
	Lohri Achhri	?	9	1½
	Pushtari	?	7	2½
	Bhubhu	10,000	9	4
	Majang	?	5	2
Plach	Chul	?	10	6
	Sirikand	15,000	25	24?
	Maghian	?	8	3½
	Tikkar	?	7½	?
	Dundku	?	11	7
	Ramgarh	?	2	?
	Nunun	?	7	2½
	Jalori	10,500	7	3
	Raghopur	?	8	5
	Himri	?	6	3
	Sakiran	?	10	3
	Suphakun	?	13	5
	Gargarasan	17,000	16	5
	Bashleo	11,000	8	3½
	Plach	?	10	4
	Tirath	?	10	4½

The Extra Assistant Commissioner also states that it was very cold throughout the whole of the month, and more or less cloudy after the 15th. There were heavy falls of snow on the 16th, 17th and 23rd, which closed all the passes that were then open. The fall of snow this winter up to the end of January has been very heavy and the cold unusually severe.

Summary of Special Storm Reports.

The Barque *Harrington* reports that she experienced very heavy weather with frequent squalls on the 10th, 11th and 12th, to the west of Sumatra in Lat. 1° to 2°S., and Long. 93°E. On the 11th she had "very severe" to "tremendous" squalls from the west with very heavy rain. A large number of water-spouts passed near the vessel.

12th.—Gale and duststorm at Hyderabad in Sind.

16th & 17th.—Westerly gales at Bhuj, average velocity of wind 30 miles per hour.

16th & 17th.—Strong winds and heavy rain at Lahore, wind and cloud from south during the storm. Barometer rose very rapidly immediately after the rain ceased.

16th.—Hailstorm at Cawnpore. Lasted for 5 minutes. The hailstones were of the size of sparrows' eggs. Wind and clouds from north during the storm.

16th & 17th.—"Terrible snowstorm and severe gale of wind" at Murree.

20th.—Violent hailstorm at Akola at 7-30 P. M., from southwest. Lasted ten minutes.

22nd to 24th.—Strong winds and heavy rain at Allahabad. For some days previous the sky was partially covered with cirri and cirro-cumuli clouds, moving from W or WSW. The early morning of the 22nd was intensely cold, hoar-frost covering the ground. Very heavy rain fell during the storm with incessant heavy thunder from 11 A.M. to 2 P.M. of the 23rd.

23rd.—Severe thunderstorm with hail at Sutna from 11 A.M. to 0-30 P.M.

Temperature of the Air.

The distribution of temperature in India for January 1891 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. I, II and III of Plate III. In these charts equal variations of temperature are in-

dicated by lines, the lines being drawn for differences of 2° of variation. The continuous lines indicate that the temperature was in excess by the amount indicated by the number given near the line, and the broken lines, 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 data by means of which these charts have been prepared are given in Table I. The mean maximum and minimum temperatures have been obtained for each station from the observations of the same number of years, *viz.*, 1876 to 1888. 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 amounts, which vary from month to month. But the variation of the mean daily temperature from the normal, as determined by the use of this definition, agrees in almost all cases very closely with the variation, as determined by the use of true daily means based on readings at 10 and 16 hours in addition to those 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.

As is usually the case except under very abnormal conditions (for example February and March 1891), the mean maximum and mean minimum temperatures varied in opposite directions over the greater part of India, and consequeutly the variations of the mean temperature were comparatively small.

The mean maximum or day temperature was in excess in the Peninsula and in Burma and the greater part of Bengal. The excess was generally small in amount and exceeded 2° only, at Rangoon (+3·1°), Bassein and Madras (+2·7°) and Trichinopoly (+2·3°). It was more or less in defect over the remainder of India, the deficiency being large in amount in Sind and the Punjab where it exceeded 4°. The deficiency was absolutely greatest at Sialkot (—5·7°) and Rawalpindi (—5·0°). The maximum temperature was also below the normal at the hill stations in Upper India, but by smaller amounts than at the adjacent plain stations. The deficiency was greatest at Quetta (—3·4°) and Murree (—3·1°).

The mean minimum or night temperature of the month was in excess in Northern India. The excess was greatest in the Indus Valley at Mooltan (+3·4°) and Jacobabad (+3·3°). It was generally in defect in the Peninsula and Burma. The deficiency was most marked in the Deccan near the West Ghats at Poona (—3·5°), and at Coimbatore (—2·7°), and Malegaon (—2·5°).

In consequence of the opposite character of the variations of the maximum and minimum, the mean temperature varied less than 1° from the normal over by far the greater part of India. It was more than 1° in excess at Rangoon (+1·3°), Bassein (+1·7°), Silchar (+1·2°); Trichinopoly (+1·5°), Salem (+1·1°), and Secunderabad (+1·2°). The deficiency slightly exceeded 1° at Sirsa (—1·4)°, Jeypore (—1·1°), Ludhiana (—1·7°), Lahore (—1·6°), Sialkot (—3·5°?), Rawalpindi (—1·2°), and Peshawar (—1·3°) in the Punjab and Rajputana and at Murree (—2·3°) and Quetta (—1·2°).

The lowest night temperatures of the month in Northern India were registered on the 17th, 18th and 19th, but the temperatures recorded were not so low as have been registered in previous years. The following are the most noteworthy :—

Station.	Date.	Minimum temperature registered on night of date.	Lowest minimum temperature previously registered in January.
		°	°
Leh	19th	2·0	
Quetta	18th	16·8	14·0 in 1878
Murree	18th	22·2	20·7 in 1878
Simla	18th	24·7	21·0 in 1883
Rawal Pindi	19th	31·9	24·9 in 1879
Peshawar	19th	32·9	29·8 in 1878
Sialkot	19th	33·2	31·6 in 1878

A reference to the barometer section will show that these minimum temperatures were registered during the cold period following the second and largest storm of the month. It is interesting to note that a remarkable fall of temperature occurred at Meshed on the Persian Frontier at this period and about two days earlier than the corresponding cold period in Upper India. The following give the maximum and minimum temperatures registered at that station during the period extending from the 14th to the 19th :—

Date.	8 A.M.	4 P.M.	Max.	Min.	Remarks
	°	°	°	°	
14th	21·0	30·0	35·0	20·0	
15th	27·0	26·5	35·0	25·0	Snow in afternoon.
16th	8·0	19·0	23·5	6·0	
17th	4·0	24·0	29·0	1·5	
18th	14·0	32·0	37·0	9·0	
19th	30·0	36·0	43·5	25·0	

The month was marked by large temperature changes. The larger changes accompanied the progress of the depressions described in the preceding section. Each depression was preceded by a warm wave and followed by a cool dry wave. The change of temperature which occurred during the passage of these storms amounted in some cases to nearly 20°. The following gives a summary of the chief features of the temperature conditions of the month.

Ordinary anti-cyclonic conditions prevailed at the commencement of the month. The day temperature was above the normal by day, and below it by night in the plains, and above it both by day and night at the hill stations. Hence the minimum temperatures at the hill stations in Northern India were occasionally higher than those of the adjacent plain stations. The following gives a single example by way of illustration :—

Hill Station.	Minimum temperature on night of 3rd.	Plain Station.	Minimum temperature on night of 3rd.
	°		°
SIMLA	46·3	Lahore	41·1
		Delhi	44·1
		Agra	44·6
		Allahabad	41·6
		Benares	45·5
		Jeypore	43·2
		Indore	44·3
		Poona	46·0

The following gives the provincial variations for the 5th January :—

PROVINCE.	Mean variation of maximum from normal.	Mean variation of minimum from normal.	Variation of mean temperature from normal.
	°	°	°
Punjab	—0·4	+0·4	0
Sind and Rajputana	+2·6	+1·7	+2·2
Central India and Guzerat	+3·7	—3·1	+0·3
N.-W. Provinces and Oudh	+0·4	+0·5	+0·5
Bengal	+0·3	—1·1	—0·4
Central Provinces and Berar	+1·5	—5·5	—2·0
Bombay	+2·2	—6·4	—2·1
Madras	0	—4·2	—2·1
Burma	+1·5	—2·8	—0·7

The chief features at this time were the unusually low night temperature in the Peninsula, Central India and Burma, and the higher day temperature than usual in Sind, Rajputana and Central India.

A feeble depression crossed Northern India between the 6th and 9th. The temperature changes which accompanied it were comparatively small.

The following gives the variations of the mean daily temperature from the normal in Northern India during this period :—

PROVINCE.	Variation from normal of the mean temperature of the					
	6th.	7th.	8th.	9th.	10th.	11th.
	°	°	°	°	°	°
Punjab	+1·5	+3·1	+2·9	—0·2	—0·5	+0·7
Sind and Rajputana	+2·5	+4·3	+4	—0·4	+0·8	+2·0
North-Western Provinces and Oudh	+1·3	+2·0	+3·3	+2·6	+0·7	+1·3
Central India and Guzerat	+1·3	+2·1	+3·3	+2·5	—0·4	+1·0
Bengal and Assam	+0·2	+0·1	+0·4	+1·2	+2·6	+1·3

The easterly advance of the warm wave in front of the depression is better shewn by the following data, giving the place and amount of the greatest excess of temperature on each day :—

Date.	PLACE.	Variation of mean temperature of day from normal.
		°
5th	Jacobabad	+4·0
6th	Mooltan	+6·1
7th	Agra	+6·3
8th	Jhansi	+7·4
9th	Burdwan	+7·4
10th	Dacca	+3·2

The cool wave in the rear of the depression was not so well marked as usual.

Temperature increased steadily from the 10th to the 15th over the whole of Northern India. The following gives the provincial variations on the 15th in Northern India :—

PROVINCE.	Variation of mean maximum temperature of day from normal.	Variation of mean minimum temperature of day from normal.	Variation of mean daily temperature from normal.
	°	°	°
Punjab	+1·4	+0·1	+0·8
Sind and Rajputana	+3·2	+3·3	+3·3
Central India and Guzerat	+4·5	+2·5	+3·5
North-Western Provinces and Oudh	+4·5	+0·3	+2·4
Bengal and Assam	+1·8	—0·8	+0·5
Burma	+1·0	—0·1	+0·5

A cold weather storm which gave heavy snow in the hills and moderately heavy rain in the plains of Upper India advanced eastwards across Northern India during the period from the 16th to the 20th. The following table gives the excess and defect of temperature on each day from the 14th to the 21st at two stations representative of the areas of increased and diminished temperature in front and rear of the storm, and illustrates the advance of the warm and cool waves :

Period of 24 hours preceding 8 A.M. of the	Stations where greatest excess of temperature (variation from mean daily) was observed.	Amount of excess.	Stations where greatest deficiency of temperature was observed.	Amount of deficiency.
		°		°
15th	Quetta	+7·5		
	Deesa	+8·1		
16th	Jeypore	+9·1	Quetta	— 1·3
	Ajmere	+8·2		
17th	Nowgong	+8·9	Quetta	—14·5
	Jhansi	+8·8	Jacobabad	— 8·3
18th	Sutna	+7·1	Ajmere	—15·0
	Allahabad	+6·4	Deesa	—12·8
19th	Gya	+5·5	Sambhar	—12·9
	Patna	+4·7	Neemuch	— 9·3
20th	Burdwan	+4·2	Jeypore	—11·7
	Dhubri	+3·5	Neemuch	—10·9
21st			Jeypore	— 9·3
			Nowgong	— 8·9
22nd			Nowgong	— 6·0
			Gorakhpur	— 5·9

The lowest temperatures of the month were registered during this period and on the early mornings of the 16th, 17th and 18th.

A brief interval of fine weather followed until the 21st, when another depression appeared on the North-West Frontier and travelled across India during the next four days. The following table giving the greatest excess and greatest defect of temperature on each day from the 22nd to the 28th, exhibits the progress of the warm and cold waves accompanying the storm :—

Period of 24 hours preceding 8A.M. of the	Stations where greatest excess of temperature (variation from mean daily) was observed.	Amount of excess.	Stations where greatest deficiency of temperature was observed.	Amount of deficiency.
		°		°
23rd	Saugor	+6·8	Kurrachee	—13·7
	Jubbulpore	+5·9	Hyderabad	—13·3
24th	Burdwan	+4·8	Jeypore	—13·4
	Cuttack	+4·4	Mount Abu	—15·3
25th	Akyab	+4·7	Jeypore	— 9·3
	Chittagong	+2·5	Agra	— 8·9
26th	Bassein	+3·0	Nowgong	— 7·4
	Akyab	+3·5	Sutna	— 7·3
27th	... ..	...	Sutna	— 5·7
			Hazaribagh	— 5·7
28th	Deesa	+6·8	Gya	— 3·4
			Saugor Island	— 3·3
29th	Ajmere	+8·5	False Point	— 4·8
	Deesa	+8·2	Saugor Island	— 2·9

The figures of Deesa and Ajmere for the 28th and 29th in the preceding table are given to show the rapid increase of temperature in North-Western India as the cool wave advances eastwards.

During the remainder of the month normal anti-cyclonic weather prevailed and temperature increased moderately rapidly, and was generally above the normal at the end of the month. The following gives data for the 31st :—

Province.	Variation from normal. Of maximum temperature of previous 24 hours.	Of minimum temperature of previous 24 hours.	Of mean temperature of previous 24 hours.
	°	°	°
Punjab	—3·0	+1·9	—0·6
Sind and Rajputana	+0·6	+0·8	+0·7
Central India and Guzerat	+3·1	+2·1	+2·6
North-Western Provinces and Oudh	—2·0	+0·1	—1·0
Central Provinces and Berar	+3·3	+0·4	+1·9
Bengal and Assam	+0·5	— 0·7	—0·2
Burma	+2·7	—1·1	+0·8
Bombay	+5·2	+1·2	+3·2
Madras	+0·3	—1·8	—0·8

The temperature was most excessive at the end of the month in Kathiawar and Guzerat, where it was upwards of 8° above the normal of the date.

Winds.

The cold weather wind system is generally most fully and strongly exhibited in January. Westerly winds blow down the Gangetic valley, and are continued as north-westerly and northerly winds in Bengal and as north-easterly winds in the Bay of Bengal. In Central India and the Central Provinces, winds are on the average from the north and north-east, and over the greater part of the Peninsula they range between north-east and east and blow across the West Ghats and the west coast districts into the Arabian Sea from the east where they are continued as north-east winds. The average strength of the air movement is nowhere large in amount and ranges from one or two miles an hour in Upper India to an average of ten or twelve miles on the sea coast.

The air movement in January 1891 was on the whole generally stronger and steadier than usual, chiefly in consequence of the prevalence of more strongly marked cold weather conditions in Upper India than usual. The following gives five examples of the greater steadiness and strength of the winds in Northern India during the month :—

Station.	Average steadiness, January 1891.	Normal steadiness, January.	Average daily air movement, January 1891.	Normal daily air movement, January.
Kurrachee	47	17	271	241
Ludhiana	50	25	50	28
Roorkee	39	16	70	52
Allahabad	48	20	96	49
Hazaribagh	65	54	184	118
Saugor Island	64	19	202	151

In Sind and Rajputana easterly winds were unusually prevalent. These were due to the depressions which advanced eastwards from Beluchistan during the month. The mean wind directions were practically normal in the Gangetic plain, but were more northerly than usual in Bengal. Thus at Calcutta the mean wind direction was N 6° W,

the normal being N 38° W. Winds were also steadier and slightly stronger in the Central Provinces, but were generally fairly normal in direction. In the Peninsula and the west coast they were very approximately normal in strength and direction. In Burma they were weaker although considerably steadier than usual. They were also more northerly than usual in Burma and also at Port Blair, and probably over a large part of the Bay.

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 offices of the Meteorological Reporter, Director of Land Records or other officer in the province, and published in the provincial gazette. 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 January 1891, are based in part upon the rainfall data of the meteorological observations throughout India, and in part upon the rainfall information relating to the month telegraphed to Simla by district officers. 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 160 meteorological stations. The distribution of rainfall is shewn on this chart by means of isohyetic lines or lines of equal amounts of rainfall, the numbers attached to each line indicating the rainfall. Over a considerable portion of the country no rain fell. The line of no rainfall is indicated by two parallel lines separated by a short distance, one continuous and the other dotted, the latter facing the districts of no rainfall.

The second chart illustrating the distribution of the rainfall of the month, is given in Plate V, and shows by figures, the variation of the mean actual rainfall of the month from the normal rainfall in each of the 51 meteorological districts into which India and Burma has been divided for purposes of comparing crops, rainfall, &c. The data of this chart are deduced from the rainfall information telegraphed by district officers, of which a summary is given in the following table and the actual figures utilized are those given in the last column. The numbers given in the centre of each district are the variations of the actual mean rainfall of the district from the normal mean rainfall, a number given in a corner of each district in small slanting figures serves as an index by means of which in referring to the list of districts at the foot of the chart the name of the district can be at once ascertained :—

Province.	Division.	Rainfall of week ending January 1891. 3rd	10th	17th	24th	31st	Total rainfall January 1891.	Normal rainfall January.	Variation of rainfall of the month.
		Inches.	Inches.	Inches.	Inches.	Inches.			
Burma	Tenasserim	...	...	...	0·14	...	0·14	0·10	+0·04
	Lower Burma	...	...	...	...	...	...	0·23	−0·23
	Central do.	...	..	...	...	...	...	0·08	−0·08
	Upper do.	...	...	...	...	...	...	?	?
	Arakan	...	...	...		..	...	0·13	−0·13
Bengal and Assam	Eastern Bengal	...	...	...	0·01	0·01	0·02	0·69	−0·67
	Assam (Surma)	...	..	0·16	...	...	0·16	9·47	−0·31
	Do. (Bhramaputra)	...	0·17	0·16	0·06	0·12	0·51	0·82	−0·31
	Deltaic Bengal	...	...	...	0·01	...	0·01	0·60	−0·59
	Central do.	...	..	...	0·55	0·06	0·61	0·51	+0·10
	North do.	...	...	...	0·40	0·03	0·43	0·54	−0·11
	Orissa	...	...	0·04	...	..	0·04	0·40	−0·36
	Chota Nagpur	...	...	...	1·08	...	1·08	0·75	+0·33
	Behar (South)	...	...	...	1·58	...	1·58	0·69	+0·89
	Do. (North)	...	...	...	1·07	...	1·07	0·69	+0·38
North-Western Provinces and Oudh.	North-(Western Provinces (East)	...	..	...	1·17	...	1·17	0·80	+0·37
	Oudh South)	...	...	...	0·80	...	0·80	0·74	+0·06
	Do. (North)	0·02	...	0·01	0·99	..	1·02	0·88	+0·14
	North-Western Provinces (Central)	...	...	..	0·47	0·01	0·48	0·67	−0·19
	Do. do. (West)	...	...	0·07	0·48	...	0·55	0·72	−0·17
	Do. do. (Submontane)	...	0·04	0·10	1·34	0·02	1·56	1·31	+0·25

Province.	Division.	Rainfall of week ending January 1891. 3rd.	10th.	17th.	24th.	31st.	Total rainfall January 1891.	Normal rainfall January.	Variation of rainfall of the month.
		Inches.	Inches.	Inches.	Inches.	Inches.			
Punjab	Punjab (South)	...	0·03	1·23	0·44	...	1·70	0·81	+0·89
	Do. (Central)	...	0·04	0·89	0·74	...	1·67	0·94	+0·73
	Do. (Submontane)	.	0·46	1·75	1·38	0·08	3·67	1·64	+2·03
	Do. (Hill Districts)	0·02	0·82	1·32	1·96	0·12	4·24	4·03	+0·21
	Do. (North-West)	0·19	0·22	2·99	0·70	0·27	4·37	2·03	+2·34
	Do. (West)	...	0·16	0·76	0·17	0·11	1·20	0·72	+0·48
Bombay and Malabar Coast Districts (Madras).	Malabar	...	...	...	0·14		0·14	0·51	−0·37
	Madras (South Central)	...	...	...	0·62	...	0·62	0·43	+0·19
	Coorg	...	...	...	0·13	...	0·13	0·04	+0·09
	Mysore	...	...	...	0·04	...	0·04	0·35	−0·31
	Konkan	...	...	..	0·01	...	0·01	0·30	−0·29
	Bombay Deccan	...	...	...	0·06	...	0·06	0·13	−0·07
	Hyderabad (North)	?	?	?	?	?	?	?	?
	Khandeish	...	...	...	0·01	...	0·01	0·22	−0·21
Central Provinces and Berar.	Berar	...	...	...	0·24	...	0·24	0·48	−0·24
	Central Provinces (West)	...	...	...	0·40	...	0·40	0·49	−0·09
	Do. (Central)	...	...	...	0·28	...	0·28	0·62	−0·34
	Do. (East)	...	...	...	0·46	0·01	0·47	0·52	−0·05
Bombay (North)	Guzerat	...	...	...	..	...	...	0·03	−0·03
	Kattiawar	...	...	...	...	...	...	0·06	−0·06
	Sind	...	...	0·10	0·40	0·08	0·58	0·42	+0·16
Rajputana and Central India.	Central India (East)	...	...	0·01	0·43	0.02	0·46	0·42	+0·04
	Rajputana (East) Central India (West)	...	...	0·06	0·27	...	0·33	0·25	+0·08
	Rajputana (West)	...	...	0·28	0·11	...	0·39	0·31	+0·08
Madras	East Coast (North)	...	...	...	...	0·02	0·02	0·25	−0·23
	Do. (do.) (a)	...	...	...	...	...	...	?	?
	Hyderabad (South)	...	...	...	...	...	...	0·20	−0.20
	Madras (Central)	...	...	...	0·03	...	0·03	0·11	−0·08
	East Coast (Central)	...	...	...	0·68	0·02	0·70	0·43	+0·27
	East Coast (South)	...	...	...	0·79	0·01	0·80	0·84	−0·04
	Madras (South)	...	...	...	0·20	...	0·20	0·99	−0·79

It should be noted that the total rainfall data given in the sixth column of the table gives results for a period of four days in December (*viz.*, from the 28th to 31st) in addition to the rainfall of the month. As the rainfall of these four days was almost *nil*, the totals given in the sixth column may be accepted as practically those of the month of January.

The rainfall of the month was almost entirely due to the cold weather disturbances enumerated under the section on pressure. The north-west districts of the Punjab received some showers at the commencement of the week, after which fine weather prevailed everywhere for some days. The first storm, that of the 8th and 9th, gave rain to the plain districts of the Punjab, and the submontane districts of North-Western Provinces, and moderate to heavy snow in the hill districts. Some thunderstorms with light rain were experienced in Rajputana, Guzerat, and Khandeish, on the 13th and 14th. A disturbance appeared in the Punjab on the 16th, which gave very heavy rain on that and the following day to the Punjab, and local rain in Sind, Rajputana and the submontane districts of the North-Western Provinces. The largest amounts received during this storm were 5·35 inches at Sialkot, 5·07 inches at Kalinta (Rawalpindi district), and 4·41 inches at Jhelum. Murree and the Kashmir Himalayas had an unusually heavy fall of snow during the same period. The fall at Murree was stated to have exceeded 9 feet. The rainfall in the Punjab ranged from an average of 0·76 inch in the western districts to an average of 2·99 inches in the north-east districts. During the interval between this and the following disturbance, thunderstorms gave light to moderate rain on the 18th, 19th and 20th over a large part of the south of the Peninsula. The third disturbance was even more influential than the two previous storms. It was a double disturbance consisting of a shallow depression which advanced from Sind across Northern India into Bengal, and of a deep but short-lived secondary depression in the Punjab. This class of disturbances usually gives very heavy rain. The present example gave general moderate or heavy rain to the whole of Northern and Central India, including the Punjab, North-Western Provinces and Oudh, Central India, Berar, the Central Provinces, Behar, Chutia Nagpur, and West Bengal. The rainfall commenced on the 22nd in north-western India and gradually extended eastwards on the 23rd and 24th with the eastward progress of the storm. Over a large portion of the area, including Chutia Nagpur, Behar, North-West Provinces east and

submontane and the Punjab hills and submontane, the average of the week exceeded 1 inch and was absolutely greatest in the Punjab hills where it was very nearly 10 inches, and South Behar where it slightly exceeded, 1½ inches. The rainfall accompanying this disturbance was more uniformly distributed over the Ganjetic plain than usual, the falls being nearly as large in Behar as in the Punjab. Rainfalls, varying from 2 inches to 5 inches in amount, were received at many stations in Behar and the Punjab. Heavy snow fell in the hill districts during the storm. Some showers were received in the Punjab on the 26th and 27th, but with this exception practically no rain fell during the remainder of the month after the breaking up of the third storm.

The rainfall of the month of January was either absolutely or practically *nil* in Burma, Eastern and Deltaic Bengal, Orissa, Bombay (excepting Sind), Mysore, Hyderabad, and the whole of Northern and Central Madras.

It was small in amount (less than half an inch) in the Central Provinces, Central India, Rajputana and South Madras.

Over the remainder of India including Chutia Nagpur, Behar, the North-Western Provinces, the Punjab and the Carnatic, the rainfall of the month ranged from half an inch to six inches, and was generally in excess.

The excess was absolutely greatest in the Punjab, more especially in the eastern and northern districts where it slightly exceeded 2 inches in amount. In the Punjab the rainfall ranged from an average of 1·2 inches in the western districts to 4·4 inches in the north-western districts. The rainfall in the North-Western Provinces varied from an average of 0·5 inch in the central districts to 1·6 inches in the submontane districts of Rohilkhand and differed little from the normal.

The rainfall in North Behar and Chutia Nagpur slightly exceeded one inch, and was about 30 per cent. above the normal. South Behar received an average of 1½ inches or 0·9 inch above its normal amount.

An interesting feature in the meteorology of the month was the tendency to the occurrence of rainfall in the Peninsula in the intervals of fine dry weather and excessive pressure in Northern India between the cold weather disturbances of the month. The Carnatic hence obtained moderate rain slightly in excess of its normal small rainfall.

Explanation of Tables.

Table I gives an abstract of the meteorological observations at 8 A.M. daily, taken at 154 stations in India during the month of January 1891.

In this table the observing stations are grouped under two sets of divisions. According to the first arrangement India and Burma are divided into eleven large meteorological areas or provinces. These divisions have been selected in consultation with the Medical Department. The climatic conditions of each area are fairly uniform and they hence are presumed to form suitable areas for the discussion of the relation between disease and meteorology. The names of these divisions are printed in bold type, and the mean variations of the more important meteorological data, more especially temperature, are given opposite to each in prominent figures.

Each of these larger divisions is subdivided into smaller meteorological areas, of which there are 51 in all. This subdivision was made in consultation with the Revenue and Financial Departments. In each of these smaller areas the distribution and character of the rainfall are fairly uniform and the staple crops in each are hence the same. This subdivision will, it is hoped, serve to make a more exact comparison between crops and rainfall than has been hitherto possible.

The headings of the columns in the great majority of cases explain themselves. The figures in the third column "variation from normal" are obtained by taking in each case the difference between the mean actual barometer (reduced for temperature but not to sea-level or constant gravity) and the normal means obtained from the observations of the twelve years' period 1877-88.

The "mean daily temperature" is assumed in table I to be the mean of the maximum and minimum. It is chiefly utilized in order to obtain the mean variation of the temperature of the month from the normal.

In obtaining the figures for the column headed "number of rainy days," a rainy day is assumed to be one on which a fall of a tenth of an inch or upwards has been recorded. A fall of less than a tenth of an inch is practically of no value for agricultural purposes in India, and it has not been found possible to secure the accurate record of rainfalls of less than a tenth of an inch at a great majority of the rainfall-recording stations.

Table II gives an abstract of the observations recorded at 10 A.M. and 4 P.M. at 82 second class observatories throughout India, Burma and the adjacent regions This table is intended in part to supplement table I, and hence information given in full in the latter table, as for example rainfall, is not reported in table II. This table is intended to give for the month, so far as is possible, all the information furnished hitherto in the Appendix A of the Annual Report on the meteorology of India. The methods of calculating the means have been very fully explained in the Annual Reports, to which the reader is referred for complete information. The data of the mean daily pressure, the figures of which are given in the sixth column, are the means of the 10 and 16 hours observations, with corrections obtained from a comparison of the 10 and 16

hours observation of the same or a neighbouring observatory, with a series of hourly observations at the same observatory.

The mean temperature is calculated by the formula $\text{mean} = \frac{\textit{maximum} + \textit{16 hours} + 2\ \textit{minimum}}{4}$ by applying a constant correction for each month, derived from the hourly observations of the same or of a neighbouring station.

The mean daily vapour tension and humidity are the averages of the values for 10 A.M., 4 P.M., and the minimum readings and the mean daily cloud is the average of the mean amounts for 10 and 16 hours.

The mean wind direction for each month is the trigonometrical resultant of the winds given under each of the eight cardinal points, and is calculated by means of Lambert's formula, in which an equal weight or value is given to every wind.

It should be noted that in the preceding discussion in speaking of the maximum or minimum, or mean temperature the total wind or rainfall of a given day, as for example the 5th, the maximum, &c., of the 24 hours preceding 8 A.M. of the 5th, is meant. This definition has been adopted to avoid confusion. As the observations are taken at 8 A.M., a part of them refer to 8 A.M. of that day and a part to the previous 24 hours, and, therefore, including a portion of the previous civil day. It is found most convenient to use the same day to designate and define both classes of observations.

It should further be noted that the following terms are frequently employed in the India Daily Weather Report and in the Monthly Weather Review, and indicate, approximately, the areas detailed opposite each.

LAND DIVISIONS.

North-Western India.—Includes the area to the north-west of a line joining Rajkot and Lucknow.

North-Eastern India.—Includes Assam, Bengal, Behar, and the North-Western Provinces (east of Lucknow).

Northern India.—Or that part of India north of a line joining Surat and Balasore.

Peninsula.—Includes the portion of India south of a line joining Surat and Balasore.

Upper India.—Includes area north of Lat. 28°, or Upper Sind, the Punjab and the upper end of the North-Western Provinces.

Central India.—Or the central tract between Rajputana and Great Indian Peninsula Railways, of which the corners are approximately Jeypore and Mount Abu to the north and Khandwa and Jubbulpore to the south.

Gangetic Plain.—Includes the North-Western Provinces, Oudh and Behar.

Bengal.—Includes the area between Behar, Assam, and the Head of the Bay (and sometimes called Lower Bengal)

Guzerat.—Includes Cutch, Kattiawar, Guzerat.

Konkan.—Includes West Coast districts from Goa to 20° North Lat.

Malabar.—Includes West Coast districts from Goa southward.

Central Provinces.—Includes Central Provinces and Berar.

West Deccan.—West Deccan includes the area between the West Ghats and 76th Meridian and extending from Malegaon to Belgaum and Dharwar.

East Deccan.—Includes Hyderabad, Kurnool, Bellary and Cuddapah.

Mysore.—Includes Coorg and Mysore.

Circars.—Includes Madras Coast districts from Ganjam to Godavari.

Carnatic.—Includes Madras Coast districts from Godavari to Lat. 12° north.

South India.—Or area south of latitude 12° north.

Burma, Upper.—Or that part of Burma to the north of latitude of Mandalay.

Burma, Central.—Or that part of Burma between the latitudes of Prome and Mandalay.

Burma, Lower.—Or that portion of Burma between the latitude of Prome and the Gulf of Martaban.

Tenasserim.—Includes the coast districts from Moulmein southward to Mergui.

COAST DIVISIONS.

Tenasserim Coast.—Includes coast from Tavoy to Moulmein.

Burma Coast.—Includes coast from Moulmein to Diamond Island.

Arakan Coast.—Includes coast from Diamond Island to Chittagong.

Bengal Coast.—Includes coast from Chittagong to Balasore.

Orissa Coast.—Includes coast from Balasore to Gopalpore.

Circars Coast.—Includes coast from Gopalpore to Masulipatam.

Coromandel Coast.—Includes coast from Masulipatam to Negapatam.

South India Coast.—Includes coast from Negapatam to Cape Comorin.

Malabar Coast.—Includes coast from Cape Comorin to Goa.

Bombay Coast.—Includes coast from Goa to Surat.

Sind Coast.—Includes coast from Surat to Karrachi.

Table

Abstract of observations taken at 8 A.M., at 154 stations

Meteorological Province or District.	Station.	Height of Station 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.
Burma Coast and Bay Islands.		...	...	−·025	...	...	...	...	...	...	..	87·3	+1·5	64·8	0·2	76·1	+0·7	22·5	...	...	...	...	30·1
Bay Islands	Port Blair	61·16	29·915	?	29·907	29·966	18th	29·840	31st	·126	78·4	86·6	?	75·7	?	81·2	?	10·9	88·9	15th	71·9	28th	17·0
Tenasserim	Mergui	96·27	29·867	?	29·895	29·941	18th	29·767	28th	·174	75·0	88·6	?	65·8	?	77·2	?	22·8	91·0	15th	60·3	12th	30·7
	Tavoy	26·26	29·972	?	29·900	30·042	18th	29·879	31st	·163	70·0	89·7	?	65·3	?	77·6	?	24·4	93·2	3rd	58·2	12th	35·0
	Moulmein	93·79	29·914	−·021	29·950	29·974	18th	29·794	31st	·180	68·4	89·1	+0·9	66·1	+0·6	77·3	+0·8	23·0	92·5	17th and 31st	62·9	12th and 13th.	29·6
	Toungoo	181·1	29·835	−·017	29·967	29·902	4th	29·705	31st	·197	60·1	84·9	−0·5	55·6	−1·9	70·3	−1·2	29·3	90·2	31st	52·1	23rd 24th & 25th.	38·1
Lower Burma	Rangoon	40·69	29·972	−·033	29·951	30·041	18th	29·843	31st	·198	68·0	91·5	+3·1	63·3	0·5	77·4	+1·3	28·2	94·8	30th	56·7	29th	38·1
	Bassein	21	29·998	−·022	29·955	30·063	18th	29·861	31st	·202	69·9	87·8	+2·7	61·4	+0·6	74·6	+1·7	26·4	90·7	26th and 30th.	57·0	5th, 6th & 7th.	33·7
	Diamond Island.	41	29·964	−·033	29·942	30·024	18th	29·867	31st	·157	73·8	85·3	+1·5	68·9	−1·7	77·1	−0·1	16·4	87·9	27th	66·6	9th and 22nd,	21·3
Arakan	Akyab	20·44	30·023	−·026	29·987	30·099	3rd	29·922	31st	·177	62·7	82·4	+1·1	61·0	+1·6	71·8	+1·4	21·4	86·2	26th	58·6	14th	27·6
Burma, Inland		...	...	−·003	...	...	...	...	...	...	..	81·0	+1·7	51·4	−2·5	66·2	−0·4	29·6	...	...	...	...	37·7
Central Burma	Thayetmyo	134	29·903	−·003	29·985	29·977	4th	29·777	31st	·200	61·7	86·9	+1·7	51·1	−2·5	69·0	−0·4	35·8	94·3	31st	48·3	6th	46·0
Upper Burma	Mandalay	?	29·794	?	?	29·891	6th	29·642	31st	·252	59·1	81·8	?	55·0	?	68·4	?	26·8	88·5	31st	51·5	1st	37·0
	Kendat	?	29·779	?	?	29·852	22nd	29·608	30th	·244	54·9	77·0	?	54·0	?	65·5	?	23·0	77·8	11 dates,	51·0	21st and 22nd.	26·8
	Bhamo	?	29·660	?	?	29·746	4th	29·506	31st	·240	49·0	78·2	?	45·4	?	61·7	?	32·8	82·5	31st	41·5	13th, 22nd, 23rd & 24th,	41·0
Assam		...	...	−·018	...	...	...	...	...	..	...	74·8	+1·5	51·3	−0·5	63·1	+0·5	23·6	...	...	...	..	32·9
Assam (Surma)	Silchar	104·3	29·975	−·005	30·037	30·043	12th	29·856	29th	·187	57·2	80·0	+3·2	51·2	−0·9	65·6	+1·2	28·8	84·3	29th	46·7	17th	37·6
Brahmaputra	Sibsagar	333	29·751	−·025	30·064	29·814	12th	29·618	30th	·196	51·7	70·8	+0·9	49·0	−0·6	59·9	+0·2	21·8	75·2	30th	44·1	8th	31·1
	Dhubri	115·34	29·958	−·023	30·035	30·044	3rd	29·838	31st	·206	55·8	73·7	+0·3	53·6	+0·1	63·7	+0·2	20·1	78·6	20th	48·5	22nd	30·1
Bengal and Orissa		...	...	−·008	...	...	...	...	...	...	.	77·5	+0·9	54·1	+0·4	65·5	+0·7	23·4	...	...	...	...	30·4
East Bengal	Chittagong	86·7	29·969	−·021	30·008	30·029	12th	29·86	31st	·161	60·1	79·2	+1·7	54·5	−0·9	66·8	+0·4	24·7	83·7	20th	51·9	18th	31·8
	Lungleh	?	Not recorded.								58·4	69·4	?	51·3	?	60·3	?	18·1	69·9	13 dates,	46·5	14th	23·4
	Noakholly	42·73	30·028	?	30·020	30·094	12th	29·904	29th	·190	61·8	78·1	?	52·4	?	65·3	?	25·7	81·5	24th and 25th.	50·0	13th	31·5
	Comilla	34·75	30·036	?	30·020	30·101	3rd	29·929	31st	·172	60·4	78·7	?	52·6	?	65·7	?	26·1	82·4	25th	50·1	13th and 21st.	32·3
	Serajgunj	46·37	30·023	?	30·021	30·094	3rd	29·921	31st	·173	57·7	76·4	?	52·3	?	64·4	?	24·1	79·7	24th	47·0	21st	32·7
	Dacca	21·7	30·034	−·025	30·005	30·103	3rd	29·938	29th	·165	59·2	78·8	+0·7	56·0	+1·1	67·4	+0·9	22·8	81·6	20th	52·8	21st and 31st.	28·8
	Burrisal	12	30·057	+·001	30·015	30·126	12th	29·959	31st	·167	61·6	77·1	+3·1	54·8	+0·8	66·0	+2·0	22·3	81·3	25th	52·6	14th	28·7
	Mymensingh	55·18	30·014	−·002	30·025	30·082	3rd	29·908	29th	·174	58·4	75·7	+1·6	53·8	+2·6	64·7	+2·1	21·9	78·2	20th and 29th.	47·4	21st	30·8
Deltaic Bengal	Furreedpore	39	30·050	?	30·040	30·112	12th	29·957	31st	·155	59·9	73·7	?	54·0	?	63·9	?	19·7	74·5	23rd	50·0	31st	24·5
	Jessore	33·29	30·044	−·006	30·025	30·117	12th	29·942	29th	·175	59·3	77·0	−1·1	53·9	+0·9	65·5	−0·1	23·1	81·2	20th	50·5	1st	30·7
	Calcutta	21·38	30·069	−·003	30·037	30·141	2nd	29·974	9th	·167	59·7	77·1	+0·4	54·5	−0·9	65·8	−0·3	22·6	81·5	20th	50·8	5th	30·7
	Saugor Island	25·3	30·059	−·001	30·029	30·127	2nd	29·975	30th	·152	62·5	76·7	+0·2	58·4	−0·9	67·6	−0·4	18·3	80·2	20th	53·8	17th	26·4
	Kishnaghur	46·64	30·035	?	30·033	30·105	12th	29·937	9th	·168	59·0	78·2	?	51·9	?	65·1	?	26·3	82·5	20th	47·0	31st	35·5
	Midnapore	148·88	29·942	?	30·046	30·014	2nd	29·832	9th	·182	61·0	81·2	?	54·7	?	68·0	?	26·5	86·3	10th and 20th.	49·2	3rd	37·1
Central Bengal	Bankoora	300	29·766	?	30·036	29·842	2nd	29·657	9th	·185	58·2	78·6	?	54·1	?	66·4	?	24·5	85·0	10th	49·0	17th	36·0
	Raneegunge	333	29·763	?	30·060	29·852	2nd	29·644	9th	·208	59·1	77·9	?	54·4	?	66·2	?	23·5	83·1	20th	49·8	17th	33·3
	Burdwan	99·09	30·002	+·006	30·054	30·080	2nd	29·890	9th	·190	60·0	78·1	−0·1	55·3	+0·7	66·7	+0·3	22·8	82·5	20th	50·3	2nd, 16th & 17th.	32·2

I.

in India, Burma, &c., in January 1891.

Wind Direction: Number of winds from									Wind Velocity.			Hygrometry, 8 A.M.		Mean cloud amount.	Rainfall.									Station.	Meteorological Province or 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 31st January.	Normal rainfall for period 1st to 31st January.	Variation from normal of period.		
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	**Burma Coast and Bay Islands.**	
3	11	8	...	1	1	...	1	2	6	7	− 14	82	·795	3·2	2	...	...	0·63	?	?	0·63	?	?	Port Blair .	Bay Islands.
...	10	5	2	3	1	...	1	9	3	2	+ 50	81	·704	1·1	1	...	...	0·23	?	?	0·23	?	?	Mergui .	Tenasserim.
26	1	2	...	..	...	...	...	2	1	?		89	·661	0·5	1	...	...	0·42	?	?	0·42	?	?	Tavoy.	
...	6	22	2	...	1	...	...	...	3	2	+ 50	88	·620	0·2	0	...	...	Nil.	Nil.	0	0	Nil.	0	Moulmein.	
1	21	1	...	...	...	...	...	8	2	2	0	88	·464	0·3	0	...	...	Nil.	0·09	−0·09	0	0·09	−0·09	Toungoo.	
...	9	16	3	...	...	...	1	2	4	4	0	79	·540	0·5	0	...	...	Nil.	0·18	−0·18	0	0·18	−0·18	Rangoon .	Lower Burma.
11	6	4	...	...	...	...	...	10	5	3	+ 67	87	·566	1·0	0	...	...	Nil.	0·07	−0·07	0	0·07	−0·07	Bassein.	
...	17	2	1	...	...	...	...	11	5	6	− 17	71	·636	0·9	0	...	...	Nil.	0·24	−0·24	0	0 24	−0·24	Diamond Island.	
...	22	9	...	...	...	...	...	...	2	3	− 33	86	·490	0	0	...	...	Nil.	0·11	−0·11	0	0·11	−0·11	Akyab.	Arakan.
...	...	...	...	...	...	...	..	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...	...	**Burma, Inland.**	
...	13	8	1	...	...	1	1	7	4	2	+100	74	·408	0·1	0	...	...	Nil.	Nil.	0	0	Nil.	0	Thyetmyo .	Central Burma.
31	...	...	...	...	...	...	...	...	?	?	?	88	·441	0	0	...	...	Nil.		?	0	?	?	Mandalay .	Upper Burma.
27	1	2	...	...	...	...	...	...	1	?	?	96	·433	0	0	...	...	Nil.	?	?	0	?	?	Kendat.	
2	...	6	...	7	...	8	1	7	?	?	?	92	·338	2·1	0	...	...	Nil.	?	?	0	?	?	Bhamo.	
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...	...	...	...	**Assam.**	
27	...	...	3	1	...	...	...	...	1	2	− 50	89	·419	3·2	0	...	...	Nil.	0·71	−0·71	0	0·71	−0·71	Silchar .	Assam (Surma).
2	...	9	6	7	...	5	...	2	1	2	− 50	100	·386	9·3	2	..	...	0·46	1·45	−0·99	0·46	1·45	−0·99	Sibsagar .	Brahmaputra.
3	3	11	8	2	...	3	...	1	5	4	+ 25	92	·415	2·4	1	...	...	0·22	0·29	−0·07	0·22	0·29	−0·07	Dhubri.	
...	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	**Bengal and Orissa.**	
...	7	9	...	1	...	2	9	3	2	4	− 50	87	·454	0·2	0	...	...	Nil.	0·52	−0·52	0	0·52	−0·52	Chittagong .	East Bengal.
Not recorded.									?	?	?	74	·353	?	0	...	...	Nil.	?	?	0	?	?	Lungleh.	
2	20	5	1	...	...	...	...	3	3	?	?	86	?		0	...	...	Nil.	?	?	0	?	?	Noakholly.	
2	13	3	4	...	3	1	5	...	1	?	?	87	?	1·1	0	.	...	Nil.	?	?	0	?	?	Comillah.	
...	7	3	1	...	2	2	7	9	1	?	?	92	?	0·6	2	...	...	0·17	?	?	0·17	?	?	Serajgunj.	
6	11	3	1	1		1	2	6	3	2	+50	87	·437	0·3	0	...	...	Nil.	0·28	−0·28	0	0·28	−0·28	Dacca.	
23	4	2	...	...	..	...	...	2	2	?	?	88	·495	0·1	0	...	...	Nil.	0·80	−0·80	0	0·80	−0·80	Burrisal.	
5	4	6	7	1	...	...	2	6	2	?	?	90	·442	0·9	0	...	...	0·05	0·38	−0·33	0·05	0·38	−0·33	Mymensingh.	
22	5	2	...	...	...	...	...	2	2	?	?	90	?	0·2	0	...	...	Nil.	?	?	0	?	?	Fureedpore .	Deltaic Bengal.
22	3	...	..	...	1	...	...	5	2	2	0	89	·455	0·4	0	...	...	Nil.	0·50	−0·50	0	0·50	−0·50	Jessore.	
14	8	1	1	...	...	1	1	5	2	3	−33	86	·441	1·0	0	...	...	Nil.	0·50	−0·50	0	0·50	−0·50	Calcutta.	
...	14	11	1	...	...	1	1	3	9	6	+50	90	·512	0·9	0	...	...	Nil	0·26	−0·26	0	0·26	−0·26	Saugor Island	
1	3	1	2	1	1	...	10	12	3	?	?	84	?	1·1	1	...	...	0·10	?	?	0·10	?	?	Kishnaghur.	
...	25	3	...	...	2	...	...	1	7	?	?	70	?	0·7	0	...	...	Nil.	?	?	0	?	?	Midnapore.	
6	2	...	1	...	...	...	18	3	3	?	?	76	?	1·3	0	...	...	0·06	?	?	0·06	?	?	Bankoora .	Central Bengal.
7	1	1	...	...	...	...	6	16	3	?	?	74	?	0·7	2	...	...	1·47	?	?	1·47	?	?	Raneegunge.	
12	6	1	1	...	1	1	6	3	2	2	0	72	·369	1·8	1	...	...	0·75	0·14	+0·61	0·75	0·14	+0·61	Burdwan.	

Table

Abstract of observations taken at 8 A.M., at 154 stations in India,

Meteorological Province or District.	Station.	Height of Station in feet.	Pressure 8 A.M. in inches. 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.	Temperature of air. 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.
Central Bengal	Nya Doomka	490	29·575	?	30·055	29·654	2nd	29·468	9th	·186	57·6	75·8	?	51·3	?	63·6	?	24·5	81·4	20th	47·1	4th & 16th.	34·3
	Berhampore.	66·45	30·019	−·009	30·038	30·094	2nd	29·913	9th & 29th.	·181	57·9	76·1	−0·6	54·5	+1·3	65·3	+0·4	21·6	81·6	20th	51·2	2nd & 16th.	30·4
	Rampore Bauleah.	70	30·003	?	30·026	30·073	3rd & 12th	29·906	9th	·167	58·9	74·2	?	53·9	?	64·1	?	20·3	79·9	20th	51·2	31st	28·7
	Maldah .	80	30·009	?	30·045	30·095	2nd	29·903	30th	·192	59·0	75·8	?	52·4	?	64·0	?	23·4	80·0	20th	47·5	22nd	32·5
	Bogra . .	61·48	29·999	+·006	30·016	30·064	12th	29·906	29th	·158	58·1	75·8	+1·1	52·7	0	64·3	+0·6	23·1	80·3	20th	48·2	23rd	32·1
North Bengal .	Dinagepore .	117·59	29·951	−·017	30·030	30·018	3rd	29·851	29th	·167	55·9	75·8	+1·3	?	?	...	?	?	79·6	20th	?	?	?
	Rungpore .	123	29·958	?	30·043	30·037	3rd	29·846	31st	·191	55·1	75·4	?	50·4	?	62·9	?	25·0	78·4	20th	42·9	22nd	35·5
	Jalpaiguri .	283·7	29·778	−·012	30·033	29·865	3rd	29·658	31st	·207	55·2	74·4	+1·5	50·3	+0·4	62·4	+1·0	24·1	76·4	3rd, 18th 19th, 28th & 29th.	43·6	26th	32·8
Orissa . .	Balasore .	56·15	30·040	+·006	30·045	30·136	2nd	29·936	9th	·200	61·7	80·6	+1·6	55·2	−0·5	67·9	+0·6	25·4	85·4	20th	50·5	3rd & 17th.	34·9
	False Point .	20·60	30·053	−·017	30·016	30·128	2nd	29·969	29th	·159	63·2	79·2	+0·5	56·3	−2·8	67·8	−1·2	22·9	84·9	20th	51·0	3rd	33·9
	Cuttack .	80	30·013	+·013	30·039	30·095	2nd	29·931	29th	·164	63·4	84·8	+0·2	59·3	−0·7	72·0	−0·3	25·5	88·4	20th, 22nd & 24th.	52·9	3rd	35·5
	Short's Island	?	30·064	?	?	30·154	2nd	29·984	29th & 30th.	·170	71·0	76·7	?	67·3	?	72·0	?	9·4	81·6	23rd	64·5	5th & 29th.	17·1
	Fooree .	11·99	30·066	?	30·019	30·142	2nd	29·978	29th	·164	65·6	80·7	?	62·6	?	71·7	?	18·1	83·7	11th	57·6	3rd	26·1
Gangetic Plain and Chutia Nagpur.		...	...	0	...	...	...	...	...	...	...	73·7	−0·2	49·9	+0·4	61·8	+0·1	23·7	...	...	...	...	35·8
Chutia Nagpur .	Hazaribagh.	2007·12	28·022	+·006	30·068	28·092	2nd	27·906	9th	·186	56·6	73·2	+0·6	50·8	+0·5	62·0	+0·6	22·4	79·4	19th	46·3	2nd & 3rd.	33·1
	Ranchee .	2128·14	27·885	?	30·051	27·955	2nd	27·785	9th	·170	56·3	74·2	?	49·6	?	61·9	?	24·6	80·0	10th	42·4	3rd	37·6
	Chybassa .	760	29·313	?	30·058	29·399	2nd	29·209	9th	·190	61·0	80·5	?	52·8	?	66·7	?	27·7	85·0	20th	46·0	2nd	39·0
Behar, South .	Gya . .	374·5	29·729	+·021	30·081	29·813	3rd	29·590	9th	·223	56·8	74·8	−1·8	52·1	+0·8	63·5	−0·5	22·7	82·4	19th	47·9	2nd	34·5
	Dehree .	351·14	29·743	?	30·071	29·816	2nd	29·606	9th	·210	58·2	74·9	?	52·3	?	63·7	?	22·6	82·8	19th	47·0	22nd	35·8
	Patna . .	182·84	29·909	−·012	30·056	29·978	3rd	29·787	9th	·191	56·6	72·7	+0·1	50·9	−1·3	61·8	−0·6	21·8	77·9	18th	45·4	22nd	32·5
	Arrah . .	190·02	29·894	?	30·050	29·960	2nd	29·800	30th	·160	54·6	73·5	?	50·0	?	61·8	?	23·5	79·4	19th	45·1	4th	34·3
	Buxar . .	239·22	29·849	?	30·060	29·922	19th	29·713	9th	·209	55·2	73·2	?	50·0	?	61·6	?	23·2	78·4	13th, 14th & 18th.	42·9	22nd	35·5
Behar, North .	Purneah .	125	29·952	−·009	30·039	30·028	2nd	29·837	30th	·191	51·6	73·6	−1·1	48·5	+0·6	61·1	−0·3	25·1	77·2	19th	45·1	21st	32·1
	Bhagalpur .	159·78	29·915	?	30·037	29·995	3rd	29·788	9th	·207	56·1	74·4	?	50·9	?	62·7	?	23·5	79·8	19th	46·0	22nd	33·8
	Durbhunga .	166·32	29·924	−·003	30·054	30·009	2nd	29·802	30th	·207	56·3	73·6	+1·6	52·0	0	62·8	+0·8	21·6	78·4	19th	45·4	22nd	33·0
	Mozufferpore	178·42	29·898	?	30·042	29·976	2nd	29·780	9th	·196	54·4	72·7	?	51·0	?	61·9	?	21·7	78·4	19th	43·3	22nd	35·1
	Motlhari .	223·61	29·839	?	30·037	29·929	2nd	29·718	30th	·211	53·0	73·7	?	47·3	?	60·5	?	26·4	80·2	19th	40·0	22nd	40·2
	Chupra .	181·3	29·883	?	30·043	29·959	2nd	29·761	9th	·198	53·6	73·3	?	50·2	?	61·8	?	23·1	77·8	19th	44·1	22nd	33·7
N.-W. Provinces. (Eastern Districts).	Benares .	266·97	29·822	0	30·066	29·919	19th	29·634	9th	·285	52·5	69·9	−4·8	49·4	+1·5	59·7	−1·7	20·5	76·2	30th	44·5	22nd	31·7
	Allahabad .	309·28	29·787	+·004	30·074	29·890	19th	29·655	9th	·235	53·2	74·8	+1·2	46·4	−1·1	60·6	+0·1	28·4	83·0	18th	40·1	22nd	42·9
N.-W. Provinces. (East submontane).	Gorakhpur .	255·93	29·820	−·002	30·053	29·896	11th	29·704	30th	·192	55·7	71·5	−1·9	50·2	+1·6	60·9	−0·2	21·3	76·5	18th & 19th	42·3	22nd	34·2
Oudh, South .	Lucknow .	369·4	29·711	−·003	30·069	29·820	19th	29·598	9th	·222	51·6	73·2	−0·5	47·2	+1·3	60·2	+0·4	26·0	79·7	15th	39·9	20th	39·8
N.-W. Provinces (Central.)	Cawnpore .	412	29·660	?	30·064	29·817	19th	29·497	23rd	·320	52·3	71·8	?	47·2	?	59·5	?	24·6	81·1	14th	40·3	6th	40·8
Upper—Sub-Himalayas .		...	...	+·013	...	...	...	...	...	...	...	65·4	−3·1	44·5	+0·8	54·7	−1·3	20·4	...	...	...	...	35·4
N.-W. Provinces (Submontane).	Bareilly .	568·47	29·484	+·002	30·063	29·580	19th	29·374	8th	·206	49·3	70·1	0	?	?	?	?	?	77·7	13th	?	?	?
	Dehra Dun .	2,232·4	27·766	?	30·085	27·872	12th	27·605	17th	·267	48·4	67·5	?	46·3	?	56·9	?	21·2	73·5	3rd, 13th & 14th.	40·0	25th	33·5
	Roorkee .	886·63	29·148	−·001	30·077	29·255	18th	28·941	17th	·314	47·7	67·1	−2·3	45·8	+1·6	56·5	−0·4	21·3	75·8	14th	37·4	19th	38·4
	Meerut .	737·48	29·319	+·011	30·084	29·433	19th	29·137	17th	·296	48·3	68·3	−1·8	45·8	+1·4	57·1	−0·2	22·5	75·7	13th & 14th.	38·0	19th	37·7
Punjab, Central	Delhi . .	717·81	29·363	+·033	30·101	29·486	19th	29·192	23rd	·294	51·1	69·7	−1·3	47·8	−0·3	58·7	−0·8	21·8	78·1	14th	41·2	19th	36·9
	Lahore. .	702·22	29·362	+·015	30·099	29·495	12th	29·121	16th	·374	46·4	63·3	−4·3	43·5	+1·1	53·4	−1·6	19·8	69·8	7th	36·2	19th & 20th.	33·6

I—*continued.*

Burma, &c., in January, 1891—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 31st January.	Normal rainfall for period 1st to 31st January.	Variation from normal of period.	Station.	Meteorological Province or District.
7	3	1	1	...	...	...	2	17	3	?	?	76	?	0·4	1	...	...	1·37	?	?	1·37	?	?	Nya Doomka	Central Bengal.
3	9	3	...	...	...	1	6	9	2	2	0	91	·442	0·8	2	...	...	0·71	0·34	+0·37	0·71	0·34	+0·37	Berhampore.	
3	15	2	...	...	1	3	3	4	2	?	?	85	?	0·8	2	...	...	0·57	?	?	0·57	?	?	Rampore. Bauleah.	
...	...	...	...	...	...	...	1	29	4	?	?	85	?	0·5	2	...	...	1·08	?	?	1·08	?	?	Maldah.	
11	...	2	...	...	...	...	4	14	2	?	?	86	·420	0·4	1	...	...	0·38	0·56	−0·18	0·38	0·56	−0·18	Bogra.	
...	2	5	2	...	2	1	8	11	1	?	?	89	·397	0·4	1	...	...	0·43	0·43	0	0·43	0·43	0	Dinagepore	North Bengal.
4	3	3	13	...	...	...	6	2	1	?	?	91	?	0·3	1	...	...	0·35	?	?	0·35	?	?	Rungpore.	
Not recorded.									2	?	?	92	·404	0·4	1	...	...	0·15	0·49	−0·34	0·15	0·49	−0·34	Jalpaiguri.	
1	11	6	1	3	1	1	...	7	3	?	?	77	·429	0·1	0	...	...	*Nil*	0·48	−0·48	0	0·48	−0·48	Balasore	Orissa.
...	15	2	...	...	...	...	1	13	6	6	0	88	·514	1·8	0	...	...	*Nil*	0·58	−0·58	0	0·58	−0·58	False Point.	
22	1	3	...	...	...	2	2	1	1	1	0	75	·445	2·1	0	..	...	0·05	0·14	−0·09	0·05	0·14	−0·09	Cuttack.	
...	9	11	1	...	1	...	6	3	9	?	?	74	·558	0·9	0	...	...	*Nil*	?	?	0	?	?	Short's Island.	
3	13	11	...	...	...	...	...	4	8	?	?	85	?	1·2	0	...	...	*Nil*	?	?	0	?	?	Pooree.	
..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...	...	...	**Gangetic Plain and Chutia Nagpur.**	
5	3	...	1	1	1	3	9	8	8	5	+60	68	·306	1·1	1	...	...	0·93	0·65	+0·28	0·93	0·65	+0·28	Hazaribagh	Chutia Nagpur.
16	...	...	...	1	...	2	5	7	5	?	?	57	?	2·5	1	...	...	1·15	0·68	+0·47	1·15	0·68	+0·47	Ranchee.	
4	2	3	5	...	...	8	8	1	1	?	?	68	?	1·4	0	...	...	*Nil*	?	?	0	?	?	Chyebassa.	
1	1	...	3	1	11	...	14	...	5	2	+150	70	·331	1·0	1	...	...	1·76	0·62	+1·14	1·76	0·62	+1·14	Gya	Behar, South.
9	...	...	...	...	1	16	4	1	2	?	?	72	?	0·8	1	...	...	1·42	?	?	1·42	?	?	Dehree.	
3	...	...	3	2	2	2	18	1	3	2	+50	80	·362	0·6	1	...	...	2·24	0·47	+1·77	2·24	0·47	+1·77	Patna.	
...	2	3	2	1	1	8	10	4	1	?	?	83	?	1·3	1	...	...	1·87	?	?	1·87	?	?	Arrah.	
...	...	...	4	1	...	7	18	1	4	?	?	78	?	1·3	1	...	...	1·07	?	?	1·07	?	?	Buxar.	
22	...	...	1	...	...	5	2	1	2	2	0	94	·359	0·5	1	...	...	0·56	0·39	+0·17	0·56	0·39	+0·17	Purneah	Behar, North.
25	...	...	...	...	...	...	5	1	1	?	?	83	?	0·8	1	...	...	0·92	?	?	0·92	?	?	Bhagalpur.	
8	...	2	1	1	...	8	10	1	3	2	+50	87	·396	0·3	1	...	...	1·07	0·39	+0·68	1·07	0·39	+0·68	Durbhunga.	
11	...	1	3	...	1	8	7	...	3	?	?	94	?	0·2	1	...	...	1·55	?	?	1·55	?	?	Mozufferpore.	
5	...	1	3	1	1	6	10	4	5	?	?	96	?	1·5	1	...	...	1·15	?	?	1·15	?	?	Motihari.	
2	...	...	1	5	2	8	12	1	4	?	?	89	?	0·9	1	...	...	1·42	?	?	1·42	?	?	Chupra.	
11	...	1	2	...	2	13	2	...	4	3	+33	84	·335	1·1	1	...	...	1·55	0·76	+0·79	1·55	0·76	+0·79	Benares	N.-W. Provinces. (Eastern District.)
8	1	1	1	2	1	3	10	4	4	2	+100	80	·326	1·5	1	...	...	1·32	0·89	+0·43	1·32	0·89	+0·43	Allahabad.	
2	...	1	4	2	4	4	12	2	2	2	0	81	·358	1·5	1	...	...	1·39	0·63	+0·76	1·39	0·63	+0·76	Gorakhpur	N.-W. Provinces (East submontane.)
11	...	1	...	1	1	1	14	2	3	2	+50	85	·325	2·7	3	...	...	1·31	1·19	+0·12	1·31	1·19	+0·12	Lucknow	Oudh, South.
6	...	2	1	2	1	2	10	7	4	?	?	82	·326	3·0	3	...	...	0·67		?	0·67	?	?	Cawnpore	N.-W. Provinces (Central).
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	**Upper—Sub-Himalayas.**	
15	...	1	1	1	...	...	1	12	2	3	−33	88	·310	3·1	4	...	...	1·91	1·18	+0·73	1·91	1·18	+0·73	Bareilly	N.-W. Provinces (Submontane).
28	...	1	...	1	...	...	...	1	1	2	−50	82	·283	4·6	6	...	...	3·04	?	?	3·04	?	?	Dehra Dun.	
16	...	...	...	2	1	...	10	2	3	2	+50	90	·297	2·4	5	...	...	1·57	2·09	−0·52	1·57	2·09	−0·52	Roorkee.	
11	...	...	1	5	...	1	11	2	2	2	0	84	·280	4·0	3	...	...	1·31	1·45	−0·14	1·31	1·45	−0·14	Meerut.	
6	...	...	...	2	...	1	20	2	5	3	+67	75	·282	3·8	3	...	...	1·20	1·36	−0·16	1·20	1·36	−0·16	Delhi	Punjab, Central.
24	1	...	1	2	...	...	1	2	2	2	0	91	·290	5·2	4	...	...	3·22	0·93	+2·29	3·22	0·93	+2·29	Lahore.	

Table

Abstract of observations taken at 8 A.M., at 154 stations in India,

Meteorological Province or District.	Station.	Height of Stations 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.
Punjab, Submontane.	Ludhiana	811·86	29·226	− 003	30·078	29·352	12th	29·045	8th	·307	46·9	63·6	−4·0	44·2	+0·7	53·9	−1·7	19·4	71·2	14th	36·8	21st & 22nd.	34·4
Punjab, North	Sialkot	829·47	29·209	+·012	30·085	29·346	12th	29·068	17th	·278	46·7	61·0	−5·7	41·6	−1·3	51·3	−3·5	19·4	68·5	13th	33·2	19th	35·3
	Rawalpindi	1,648·9	28·388	+·032	30·113	29·543	12th	29·181	17th	·362	43·7	58·3	−5·0	40·6	+2·7	49·5	−1·2	17·7	65·6	5th	31·9	19th	33·7
Indus Valley and North-West Rajputana.		...	...	+·021	...	...	...	...	...	...	...	68·1	−3·9	47·6	+2·1	57·8	−0·9	20·5	..	...	...	...	36·6
Punjab, West	Peshawar	1,110·4	28·999	+·029	30·140	29·176	19th	28·703	17th	·473	44·0	59·1	−4·9	41·5	+2·4	50·3	−1·3	17·6	68·2	5th & 7th.	32·9	19th	35·3
	Khushab	611·51	29·458	?	30·098	29·615	12th	29·182	16th	·433	46·3	63·7	?	46·2 ?	?	55·0	?	17·5	70·5	15th & 17th.	39·1	19th	31·4
	Montgomery	558·46	29·526	?	30·102	29·689	19th	29·215	16th	·474	47·8	64·7	?	43·6	?	54·2	?	21·1	74·3	7th	35·8	20th	38·5
	D. I. Khan	572·56	29·517	+·016	30·114	29·689	19th	29·206	17th	·483	46·8	64·7	−4·5	43·2	+2·7	54·0	−0·9	21·5	71·7	15th	37·9	21st	33·8
	Mooltan	420·19	29·700	+·034	30·123	29·875	19th	29·356	17th	·519	49·8	67·1	−2·6	45·7	+3·4	56·4	+0·4	21·4	73·3	7th	38·2	19th	35·1
	Sirsa	661·61	29·412	+·016	30·099	29·565	19th	29·172	16th	·393	46·7	67·3	−3·5	43·2	+0·8	55·5	−1·4	24·1	77·0	8th	37·2	19th	39·8
Sind and Cutch	Jacobabad	185·9	29·942	+·031	30·108	30·155	19th	29·657	17th	·498	51·0	68·9	−4·4	46·1	+3·3	57·5	−0·6	22·8	75·4	16th	35·0	18th	40·4
	Hyderabad	117·43	30·009	+·012	30·089	30·215	19th	29·787	16th	·428	55·5	71·9	−4·6	51·2	+0·3	61·5	−2·2	20·7	80·6	8th	41·3	18th	39·3
	Kurrachee	49	30·068	+·007	30·070	30·278	19th	29·870	16th	·408	58·5	73·9	−2·6	56·1	+1·7	65·0	−0·5	17·8	82·2	16th	47·1	19th & 20th.	35·14
	Bhuj	394·9	29·672	?	30·040	29·767	2nd	29·500	16th	·267	61·7	78·8	?	56·2	?	67·5	?	22·6	87·1	16th	48·2	18th	38·9
Rajputana, West	Bicharneer	743·5	28·768	?	29·515	28·836	19th	28·572	16th	·264	52·6	68·5	?	50·5	?	59·5	?	18·0	78·5	9th	43·1	18th	35·4
	Pachpadra	380	29·723	?	30·091	29·821	20th	29·609	8th	·212	53·1	?	?	47·4	?	?	?	?	?	?	38·0	19th	?
East Rajputana, Central India and Guzerat.		...	...	+·016	...	...	...	...	...	...	...	77·7	−0·2	49·3	−0·3	63·5	−0·2	28·4	...	...	...	...	45·0
Rajputana, East	Jeypore	1,430·6	28·630	+·013	30·120	28·752	19th	28·453	16th	·299	52·2	72·6	−0·9	47·1	−1·5	59·8	−1·1	25·5	80·5	16th	37·2	20th	43·3
	Sambhar	1,253·52	28·789	+·004	30·101	28·895	1st	28·579	16th	·316	48·2	71·1	−1·1	45·0	−1·6	58·0	−1·4	26·1	80·4	8th	35·5	19th	44·9
	Ajmere	1,611	28·455	+·020	30·141	28·582	19th	28·254	17th	·328	49·9	70·9	−3·0	46·2	+1·7	58·6	−0·7	24·7	80·0	8th	35·0	18th	45·0
	Deesa	465·5	29·607	+·007	30·057	29·737	19th	29·450	16th	·287	58·4	83·2	+1·0	51·9	+0·8	67·6	+0·9	31·3	90·7	8th	40·0	18th	50·7
Kattiawar	Rajkot	428·83	29·641	+·008	30·047	29·751	19th	29·513	16th	·238	59·1	83·7	−0·4	51·9	+1·0	67·9	+0·3	31·8	91·9	31st	41·0	20th	50·9
	Verawal	?	30·066 ?	?	30·026	30·133	3rd	29·954	22nd	·179	66·7	?	?	?	?	?	?	?	80·8	9th	?	?	?
	Bhavnagar	?	30·075	?	30·063	30·179	19th	29·969	16th	·210	60·3	85·2	?	54·5	?	69·9	?	30·7	90·4	5 dates	47·0	19th & 20th.	43·4
Central India	Nowgong	757·04	29·327	+·012	30·101	29·457	19th	29·164	23rd	·293	52·3	73·9	−1·4	46·1	−0·8	60·0	−1·1	27·8	84·0	9th	38·5	21st	45·5
	Sutna	1,040·1	29·014	0	30·087	29·121	19th	28·842	23rd	·279	52·8	75·1	+0·8	46·5	−0·7	60·8	+0·1	28·6	83·5	18th	40·2	2nd & 4th.	43·3
	Indore	1,823·2	28·230	+·031	30·100	28·318	19th	28·101	22nd	·217	57·0	79·8	+1·2	48·5	−1·9	64·2	−0·4	31·3	86·1	8th	41·3	19th	44·8
	Neemuch	1,630	28·425	+·024	30·107	28·537	19th	28·278	23rd	·259	55·3	77·0	−0·3	47·8	−0·8	62·4	−0·6	29·2	84·8	8th & 29th.	38·0	20th	46·8
Guzerat	Surat	36	30·043	+·016	30·023	30·140	18th	29·967	16th	·173	62·9	87·4	+1·4	55·9	−0·4	71·7	+0·5	31·5	97·2	31st	51·6	5th & 6th.	45·6
N.-W. P. West	Agra	555·44	29·550	+·026	30·111	29·686	19th	29·386	23rd	·300	51·3	72·9	−0·5	47·8	−0·5	60·4	−0·5	25·1	80·6	17th	39·7	21st	40·9
	Jhansi	840·13	29·233	+·025	30·088	29·361	19th	29·082	23rd	·279	56·4	76·7	+1·2	51·2	+0·9	64·0	+1·1	25·5	85·4	9th	44·9	20th & 21st.	40·5
Deccan	...	...	...	+·014	...	...	...	...	...	...	...	82·8	+0·6	52·8	−0·9	67·9	−0·1	29·9	...	...	...	...	41·8
Bombay, Deccan	Belgaum	2524	27·486	+·002	29·999	27·563	3rd	27·442	22nd	·121	65·5	83·0	+0·1	56·9	−0·5	70·0	−0·2	26·1	86·8	27th	50·4	5th	36·4
	Sholapur	1,589·7	28·455	+·012	30·038	28·555	3rd	28·383	22nd	·172	67·1	87·8	+0·8	57·6	0	72·7	+0·4	30·2	92·7	31st	48·1	4th	44·6
	Poona	1,840·37	28·211	+·025	30·078	28·307	2nd	28·131	22nd	·176	59·9	86·2	+1·5	51·9	−3·5	69·1	−1·0	34·3	90·1	30th	46·0	4th	44·1
Khandeish	Malegaon	1,430·12	28·629	+·018	30·088	28·725	2nd	28·543	23rd	·182	58·0	85·4	+0·5	49·5	−2·5	67·5	−1·0	35·9	91·4	31st	45·0	25th	46·4
	Ahmednagar	2,151·62	27·903	?	30·088	27·998	2nd	27·832	23rd	·166	59·4	83·3	?	49·2	?	66·3	?	34·1	88·3	31st	41·4	10th	46·9
Berar	Akola	930	29·129	+·015	30·063	29·238	2nd	29·006	23rd	·232	59·0	85·6	+1·5	52·4	−0·8	69·1	+0·4	33·2	91·4	30th	45·2	5th & 6th.	46·2
	Amraoti	1,215·5	28·834	+·016	30·052	28·9348	3rd	28·726	23rd	·208	64·4	85·0	+1·0	58·0	+0·7	71·6	+0·9	27·0	91·3		51·9	1st	39·4

I—*continued.*

Burma, &c., in January 1891—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 31st January.	Normal rainfall for period 1st to 31st January.	Variation from normal of period.	Station.	Meteorological Province or District.
12	4	...	1	...	1	...	9	4	2	1	+100	92	·299	5·3	6	...	...	5·90	1·78	+4·12	5·90	1·78	+4·12	Ludhiana .	Punjab, Submontane.
14	3	2	2	...	1	1	6	2	1	1	...	93	·302	4·2	7	...	...	6·60	1·80	+4·80	6·60	1·80	+4·80	Sialkot	
19	2	5	1	1	...	1	...	2	2	2	...	93	·270	6·2	6	...	...	4·51	2·68	+1·83	4·51	2·68	+1·83	Rawalpindi.	Punjab, North.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	**Indus Valley and North-West Rajputana.**	
8	...	1	1	3	7	7	1	3	2	2	...	83	·241	6·1	5	...	...	4·41	1·63	+2·78	4·41	1·63	+2·78	Peshawar .	Punjab, West.
28	2	...	...	...	...	...	1	...	1	?	?	75	·236	3·2	5	...	...	1·74	?	?	1·74	?	?	Khushab.	
12	4	...	2	1	3	...	5	4	3	?	?	89	·302	4·8	4	...	...	1·53	0·44	+1·09	1·53	0·44	+1·09	Montgomery.	
14	5	1	...	...	...	3	5	3	1	1	...	85	·274	4·9	3	...	...	1·23	0·48	+0·75	1·23	0·48	+0·75	D. I. Khan.	
16	1	2	...	1	...	5	...	6	1	2	−50	79	·291	4·4	3	...	...	1·04	0·39	+0·65	1·04	0·39	+0·65	Mooltan.	
7	5	2	2	1	.	1	8	5	4	3	+33	93	·298	4·7	4	...	...	2·07	0·92	+1·15	2·07	0·92	+1·15	Sirsa.	
19	1	...	2	3	1	...	...	5	2	2	...	78	·297	3·9	2	...	...	0·40	0·23	+0·17	0·40	0·23	+0·17	Jacobabad .	Sind and Cutch.
...	...	30	0	0	0	1	0	0	6	7	−14	70	·304	2·9	2	...	...	0·90	0·46	+0·44	0·90	0·46	+0·44	Hyderabad.	
1	1	19	7	0	0	0	0	3	11	10	+10	73	·369	2·5	3	...	...	1·03	0·61	+0·42	1·03	0·61	+0·42	Kurrachee.	
2	5	4	4	1	2	6	5	2	7	6	+17	65	·359	1·2	1	...	...	0·52	?	?	0·52	?	?	Bhuj.	
...	10	8	...	1	...	2	1	9	4	3	+33	70	·280	3·0	2	...	...	0·45	?	?	0·45	?	?	Bickaneer .	Rajputana, West
17	3	7	...	1	1	...	...	...	5	3	+67	83	·343	2·4	2	...	...	0·35	?	?	0·35	?	?	Pachpadra.	
...	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	**East Rajputana, Central India and Guzerat.**	
13	3	2	4	...	1	2	2	4	3	4	−25	71	·278	2·9	2	...	...	0·80	0·53	+0·27	0·80	0·53	+0·27	Jeypore .	Rajputana, East.
11	7	1	2	2	3	1	1	3	4	4	...	71	·245	2·5	2	..	...	0·97	0·36	+0·61	0·97	0·36	+0·61	Sambhar.	
24	...	2	...	...	...	2	2	1	2	2	...	77	·286	2·5	2	...	...	0·97	0·33	+0·64	0·97	0·33	+0·64	Ajmere	
...	2	16	8	...	3	...	1	1	9	9	...	47	·235	2·8	1	...	...	0·59	0·06	+0·53	0·59	0·06	+0·53	Deesa.	
6	1	7	7	2	2	3	2	1	6	5	+20	56	·288	0·7	0	...	...	*Nil*	0·03	−0·03	0	0·03	−0·03	Rajkot .	Kattiawar.
...	7	18	3	...	...	...	...	3	10	?	?	47	·312	1·6	0	...	...	*Nil.*	?	?	0	?	?	Verawal.	
...	2	4	...	...	1	13	9	2	7	?	?	74	·394	0·8	0	...	...	*Nil.*	?	?	0	?	?	Bhavnagar.	
8	4	...	2	1	...	1	9	6	2	1	+100	76	·299	1·7	1	...	...	0·41	0·77	−0·36	0·41	0·77	−0·36	Nowgong .	Central India.
4	6	1	2	...	3	1	4	10	4	4	...	72	·289	0·5	2	...	...	1·04	1·13	−0·09	1·04	1·13	−0·09	Sutna.	
23	1	2	2	1	1	...	1	...	2	2	...	55	·255	0·7	0	...	...	*Nil.*	0·16	−0·16	0	0·16	−0·16	Indore.	
7	11	5	3	...	...	3	1	1	6	8	−25	62	·291	0·7	2	...	...	2·82	0·14	+2·68	2·82	0·14	+2·68	Neemuch.	
...	5	2	1	1	1	1	5	15	?	5	?	62	·360	0·6	0	...	...	*Nil.*	0·07	−0·07	0	0·07	−0·07	Surat . .	Guzerat.
3	...	3	...	2	3	2	1	17	4	3	+33	74	·280	2·5	2	...	...	0·84	0·61	+0·23	0·84	0·61	+0·23	Agra . .	N.W. P. West.
17	...	1	...	...	2	2	...	9	2	2	0	69	·322	1·3	1	...	...	0·44	0·57	−0·13	0·44	0·57	−0·13	Jhansi.	
...	...	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	**Deccan**
10	1	5	8	5	1	...	...	1	3	11	−73	55	·351	0·4	0	...	...	0·02	0·07	−0·05	0·02	0·07	−0·05	Belgaum .	Bombay Deccan.
...	1	2	15	10	...	1	1	1	8	7	+14	54	·369	1·0	0	...	...	0·02	0·19	−0·17	0·02	0·19	−0·17	Sholapur.	
23	...	...	4	2	1	1	...	...	3	6	−50	56	·286	0·3	0	...	...	*Nil.*	0·07	−0·07	0	0·07	−0·07	Poona.	
3	1	...	...	...	1	2	14	10	4	4	...	66	·320	0·5	0	...	...	*Nil.*	0·32	−0·32	0	0·32	−0·32	Malegaon .	Khandeish.
17	3	...	1	4	...	...	1	5	3	?	?	56	·284	0·6	0	...	...	*Nil.*	0·56	−0·56	0	0·56	−0·56	Ahmednagar.	
11	4	6	6	2	...	1	...	1	4	3	+33	59	·298	1·4	1	...	...	0·86	0·51	+0·35	0·86	0·51	+0·35	Akola . .	Berar.
...	3	12	13	2	1	...	..	...	6	3	+100	52	·318	1·5	1	...	...	0·22	0·34	−0·12	0·22	0·34	−0·12	Amraoti.	

Table

Abstract of observations taken at 8 a.m., at 154 stations

Meteorological Province or District.	Station.	Height of Station in feet.	Pressure 8 a.m. in inches. 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.	Temperature of Air. 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.
Central Provinces, West.	Khandwa	1,043·71	29·019	+·035	30·081	29·127	2nd	28·908	23rd	·219	57·2	83·7	+0·6	50·1	−1·7	66·9	−0·6	33·6	89·2	30th & 31st.	42·5	3rd	46·7
	Hoshangabad	1,020	29·051	+·011	30·093	29·165	2nd	28·911	23rd	·254	55·6	80·4	+0·3	52·1	−0·4	66·3	−0·1	28·3	85·8	30th	45·8	2nd & 3rd.	40·0
	Nagpur	1,025	29·040	+·024	30·071	29·138	2nd	28·930	23rd	·208	61·8	81·4	−1·2	54·8	−0·5	68·1	−0·9	26·6	87·2	31st	48·2	2nd & 4th.	39·0
Central Provinces, Central.	Seoni	2,030	28·002	+·002	30·070	28·081	2nd	27·892	23rd	·189	58·9	78·2	−0·8	49·5	−1·8	63·9	−1·3	28·7	82·1	30th & 31st.	44·0	3rd	38·1
	Jubbulpore	1,327·02	28·730	+·019	30·101	28·826	2nd	28·577	23rd	·249	52·6	76·9	−0·1	46·8	−1·6	61·8	−0·9	30·1	82·9	9th	38·9	2nd	44·0
	Saugor	1,761·5	28·280	+·010	30·088	28·373	19th	28·136	23rd	·237	57·0	77·9	+1·5	51·1	−0·1	64·5	+0·7	26·8	82·3	9th	44·0	25th	38·3
Central Provinces East.	Raipur	960	29·087	+·010	30·057	29·196	2nd	28·983	23rd	·213	61·9	81·5	+0·8	55·5	+0·2	68·5	+0·5	26·0	86·0	31st	49·4	3rd	36·6
Hyderabad South.	Secunderabad	1,786·69	28·253	−·002	30·050	28·347	3rd	28·191	22nd	·156	63·7	85·8	+2·0	58·2	+0·4	72·1	+1·2	27·6	90·1	26th	49·1	3rd	41·0
West Coast		...	...	+·010	...	...	...	...	...	...	...	86·6	+0·6	66·4	−1·3	76·5	−0·3	20·2	...	...	...	...	29·0
Konkan	Bombay	37	30·016	+·005	29·993	30·112	2nd	29·947	29th	·165	70·4	82·5	+0·4	67·5	−0·4	75·0	0	15·0	88·9	31st	61·5	25th	27·4
	Ratnagiri	110	29·926	+·027	29·977	30·030	2nd	29·859	29th	·171	74·2	89·0	+1·7	64·9	−1·3	77·0	+0·2	24·1	96·9	29th	61·4	5th, 7th & 8th.	35·5
	Mormugoa	?	29·999	?	29·993	30·041	7th	29·928	21st & 29th.	·113	73·9	81·2	?	72·9	?	77·1	?	8·3	85·0	29th & 30th.	70·0	5th	15·0
	Karwar	43·87	29·981	+·005	29·959	30·075	3rd	29·902	29th	·173	67·2	87·7	+1·4	63·7	−2·3	75·7	−0·5	24·0	91·8	30th	58·1	4th & 5th.	33·7
Malabar	Mangalore	25·60	29·994	−·002	29·953	30·074	2nd	29·923	29th	·151	72·7	87·8	0	68·4	−0·9	78·1	−0·5	19·4	94·8	31st	63·5	6th	31·3
	Calicut	26·58	29·990	+·003	29·947	30·051	2nd	29·919	29th	·132	73·7	87·0	?	68·1	?	77·6	?	18·9	88·8	18th, 23rd & 31st.	63·7	5th	25·1
	Cochin	11·03	30·008	+·024	29·947	30·072	2nd	29·939	29th	·133	75·0	88·1	−0·4	69·9	−1·4	79·0	−0·9	18·2	91·3	28th	66·3	1st & 5th	25·0
	Trivandrum	?	29·652	?	29·930	29·710	2nd	29·531	29th	·119	74·8	84·0	?	62·5	?	73·3	?	21·5	85·0	11 dates	60·0	1st, 2nd & 4th.	25·0
South India		...	...	+·002	...	...	...	...	...	...	...	84·8	+1·2	63·8	−0·5	74·3	+0·4	20·9	...	...	...	...	29·4
Madras, South	Madura	446·60	29·584	+·008	29·977	29·641	3rd	29·519	29th	·122	74·5	88·9	+0·9	68·3	−0·2	78·7	+0·4	20·6	92·3	20th	64·2	11th	28·1
Madras, South Central.	Salem	939·91	29·125	+·008	30·031	29·194	3rd	29·077	30th	·117	70·9	89·6	+1·7	63·6	+0·5	76·6	+1·1	26·0	92·3	19th, 26th & 28th.	58·9	4th	33·4
	Coimbatore	1,347·64	28·676	−·001	30·003	28·741	3rd	28·625	29th	·116	69·4	85·0	−1·3	61·5	−2·7	73·3	−2·0	23·5	86·8	10th & 31st.	58·6	6th	28·2
Coorg	Mercara	3,780·7	26·306	?	29·992	26·395	2nd	26·250	29th	·145	61·3	79·2	+3·1	53·7	−2·4	66·5	+0·4	25·5	82·2	23rd	51·2	1st to 8th.	31·0
Mysore	Bangalore	2,981·46	27·082	−·009	30·045	27·139	3rd	27·017	29th	·122	63·6	80·0	+0·9	56·8	+0·2	68·4	+0·6	23·2	85·7	26th	51·9	31st	33·3
Madras, East-Coast South.	Negapatam	15	30·015	−·003	29·959	30·068	2nd	29·957	29th & 30th	·111	74·2	83·0	+1·2	69·1	−1·7	76·1	−0·3	13·9	84·9	20th	64·7	12th	20·2
	Cuddalore	12·44	30·047	?	29·989	30·105	3rd	29·976	29th	·129	73·1	84·0	?	68·6	?	76·5	?	15·4	85·2	8 dates	64·3	8th	20·9
	Trichinopoly	254·78	29·784	−·003	29·979	29·842	3rd	29·714	29th	·128	73·8	89·2	+2·3	66·9	+0·6	78·1	+1·5	22·3	92·0	20th & 29th.	62·4	1st & 12th.	29·6
	Madras	22	30·036	−·011	29·988	30·105	3rd	29·976	29th	·129	75·1	87·3	+2·7	67·7	−0·1	77·5	+1·3	19·6	89·0	30th	61·5	9th	27·5
Madras, East-Coast Central.	Nellore	70·82	29·989	?	29·995	30·073	3rd	29·925	29th	·148	72·7	86·2	?	65·9	?	76·0	?	20·3	88·2	28th & 30th.	61·6	4th	26·6
	Masulipatam	7·5	30·070	+·011	30·012	30·158	3rd	29·992	29th	·166	71·4	83·8	+0·5	65·6	−0·4	74·7	+0·1	18·2	86·0	28th	59·7	4th	26·3
Madras, Central	Cuddapah	433·36	29·625	?	30·012	29·697	3rd	29·554	29th	·143	70·8	88·5	?	63·8	?	76·2	?	24·7	92·0	28th	57·3	4th	34·7
	Kurnool	923·45	29·134	?	30·034	29·231	3rd	29·062	29th	·169	68·5	87·6	?	58·2	?	73·0	?	29·4	92·5	27th	46·6	4th	45·9
	Bellary	1,474·63	28·568	+·025	30·032	28·656	3rd	28·496	22nd	·160	67·9	86·9	−0·6	59·7	−0·8	73·3	−0·7	27·2	90·9	26th	50·8	3rd & 4th.	40·1
Madras East-Coast North.	Rajahmundry	112	29·952	?	30·008	30·034	3rd	29·872	29th	·162	69·9	87·6	?	64·2	?	75·9	?	23·4	92·0	28th	57·9	4th	34·1
	Coconada	26	30·049	?	30·010	30·134	3rd	29·964	29th	·170	72·4	80·0	?	65·2	?	72·6	?	14·8	82·0	12th & 28th.	59·2	3rd & 4th.	22·8
	Vizagapatam	31	30·044	−·004	30·012	30·139	3rd	29·961	29th	·178	70·8	78·6	−0·5	66·5	+0·6	72·6	+0·1	12·1	80·4	28th	59·9	4th	20·5
	Gopalpur	21·45	30·062	−·004	30·024	30·146	2nd & 3rd.	29·977	29th	·169	68·4	80·3	+3·1	63·9	+0·6	72·1	+1·9	16·4	83·2	16th	57·0	4th	26·2
Hill Stations.																							
Beluchistan	Quetta	5,502·26	24·678	+·012	?	24·825	2nd	24·408	17th	·417	33·8	48·2	−3·4	30·2	+1·0	39·3	−1·2	18·0	62·0	7th	16·8	18th	45·2
Northern India	Murree	6,343·86	23·861	+·008	?	23·988	3rd	23·556	17th	·432	38·0	44·7	−3·1	34·0	−1·5	39·6	−2·3	10·7	63·1	3rd	22·2	18th	40·9
	Simla	7,274	23·068	−·038	?	23·174	3rd	22·854	17th	·320	40·7	50·3	−0·9	37·9	+1·5	44·1	+0·3	12·4	64·0	4th	24·7	18th	39·3

I—*continued.*

in India, Burma, &c., in January 1891—continued.

Wind direction. Number of winds from									Wind velocity.			Hygrometry, 8 A.M.		Mean cloud amount	Rainfall.									Station.	Meteorological Province or 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 31st January.	Normal rainfall for period 1st to 31st January.	Variation from normal of period.		
14	8	6	...	...	1	...	1	1	3	3	...	54	·251	0·6	0	...	...	Nil.	0·28	−0·28	0	0·28	−0·28	Khandwa .	Central Provinces, West.
5	1	6	16	1	1	...	1	...	4	2	+100	67	·300	1·5	0	...	...	Nil.	0·29	0·29	0	0·29	−0·29	Hoshangabad.	
9	12	2	2	...	...	...	...	6	4	3	+33	67	·369	1·2	2	...	...	1·17	0·43	+0·74	1·17	0·43	+0·74	Nagpur.	
...	9	4	5	...	5	4	1	3	2	3	−33	73	·368	1·4	1	...	...	0·15	0·60	−0·45	0·15	0·60	−0·45	Seoni . .	Central Provinces, Central.
12	...	2	2	9	5	...	1	...	2	2	...	79	·312	0·7	0	...	...	Nil.	0·90	−0·90	0	0·90	−0·90	Jubbulpore.	
...	3	9	6	3	6	3	1	...	5	3	+67	56	·263	0·8	0	...	...	Nil.	0·76	−0·76	0	0·76	−0·76	Saugor.	
11	5		2	1	1	4	1	1	3	3	...	64	·358	1·3	1	...	...	0·42	0·15	+0·27	0·42	0·15	+0·27	Raipur .	Central Provinces, East.
19	...	4	7	1	...	...	...	...	4	4	...	72	·429	1·1	0	...	...	Nil.	0·08	−0·08	0	0·08	−0·08	Secunderabad	Hyderabad, South.
...	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...	...	...	..	...	**West Coast.**
...	4	14	11	2	...	...	...	...	10	10	...	70	·529	0·6	0	...	...	Nil.	0·13	−0·13	0	0·13	−0·13	Bombay .	Konkan.
3	1	4	14	7	1	...	...	1	8	10	−20	51	·428	0·1	0	...	...	Nil.	0·37	−0·37	0	0·37	−0·37	Ratnagiri.	
...	...	9	15	1	...	...	...	2	9	?	?	91	·758	0·1	0	...	...	Nil.	?	?	0	?	?	Mormugoa.	
...	...	19	12	...	...	...	...	...	3	?	?	78	·530	0·4	0	...	...	Nil.	10·14	−0·14	0	0·14	−0·14	Karwar.	
5	3	5	18	...	...	...	...	...	2	4	−50	74	·596	0·4	0	...	...	Nil.	0·01	−0·01	0	0·01	−0·01	Mangalore .	Malabar.
...	..	11	18	2	...	...	...	...	6	?	?	76	·630	0·5	0	...	...	Nil.	0·23	−0·23	0	0·23	−0·23	Calicut.	
14	...	7	8	2	...	...	...	...	0	?	?	73	·639	0·5	0	...	...	Nil.	0·52	−0·52	0	0·52	−0·52	Cochin.	
...	13	11	5	1	...	...	...	1	6	?	?	76	·678	2·0	1	...	...	1·08	?	?	1·08	?	?	Trivandrum.	
...	...	...	..	...	...	...	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...	...	...		**South India.**
1	15	12	...	...	...	...	...	3	4	5	−20	72	·628	0·6	0	...	...	Nil.	0·45	−0·45	0	0·45	0·45	Madura .	Madras, South.
11	...	11	7	...	...	...	1	1	3	5	−40	82	·633	1·7	1	...	...	0·15	0·48	−0·33	0·15	0·48	−0·33	Salem .	Madras, South Central.
...	15	11	2	...	2	...	...	1	3	3	...	83	·606	3·9	1	...	...	0·43	0·24	+0·19	0·43	0·24	+0·19	Coimbatore.	
...	...	4	27	...	...	...	...	...	3	4	−25	73	·406	3·0	0	...	...	Nil.	0·05	−0·05	0	0·05	−0·05	Mercara .	Coorg.
...	...	13	14	3	...	...	...	1	3	4	−25	77	·457	1·9	1	...	...	0·21	0·19	+0·02	0·21	0·19	+0·02	Bangalore .	Mysore.
...	6	7	1	...	...	...	1	16	6	5	+20	82	·690	5·4	1	...	...	0·30	2·22	−1·92	0·30	2·22	−1·92	Negapatam .	Madras East-Coast, South.
...	14	2	...	...	1	...	1	13	4	?	?	82	·670	2·0	2	...	...	1·44	?	?	1·44	?	?	Cuddalore.	
2	7	12	2	...	...	...	1	7	6	5	+20	74	·629	2·8	0	...	...	Nil.	2·85	−2·85	0	2·85	−2·85	Trichinopoly.	
7	13	5	3	...	...	...	...	3	6	6	...	78	·688	4·3	0	...	...	Nil.	1·60	−1·60	0	1·60	−1·60	Madras.	
6	4	...	...	...	...	...	3	18	4	?	?	83	·669	5·8	1	...	...	0·88	?	?	0·88	?	?	Nellore .	Madras, East-Coast, Central.
2	23	5	...	1	...	...	...	...	3	5	−40	85	·650	1·6	0	...	...	Nil.	0·24	−0·24	0	0·24	−0·24	Masulipatam.	
...	1	3	1	6	3	6	4	7	?	?	?	77	·594	1·1	0	...	...	Nil.	0·03	−0·03	0	0·03	−0·03	Cuddapah .	Madras, Central.
31	...	...	..	...	...	...	...	...	?	?	?	70	·496	0	0	...	...	Nil.	0·11	−0·11	0	0·11	−0·11	Kurnool.	
30	...	...	...	1	...	...	...	...	3	3	...	76	·517	0·4	0	...	...	Nil.	0·14	−0·14	0	0·14	−0·14	Bellary.	
5	24	2	...	...	...	...	...	...	?	?	?	74	·541	1·0	0	...	...	Nil.	?	?	0	?	?	Rajahmundry	Madras, East-Coast, North.
..	23	3	...	...	...	...	...	5	8	?	?	67	·529	0·5	0	...	...	Nil.	?	?	0	?	?	Cocanada.	
...	3	...	...	...	...	...	21	7	2	2	...	72	·546	1·2	0	...	...	Nil.	0·21	−0·21	0	0·21	−0·21	Vizagapatam.	
...	15	...	...	...	...	...	1	15	9	7	+29	74	·514	0·2	0	...	...	Nil.	0·22	−0·22	0	0·22	−0·22	Gopalpur.	
																									Hill Stations.
29	...	...	...	1	1	...	...	...	1	4	−75	82	·164	4·3	9	...	...	3·75	1·96	+1·79	3·75	1·96	+1·79	Quetta .	Beluchistan.
4	...	2	10	13	1	...	...	1	12	8	+50	63	·134	7·1	11	...	...	7·14	2·62	+4·52	7·14	2·62	+4·52	Murree .	Northern India.
3	1	2	7	14	2	1	1	...	?	2	?	51	·124	5·4	6	...	...	3·82	2·50	+1·32	3·82	2·50	+1·32	Simla.	

Table

Abstract of observations taken at 8 A.M., at 154 stations

Meteorological Province or District.	Station.	Height of Station 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.
Northern India —*contd.*	Mussoorie	?	23·616	?	?	23·698	14th & 27th.	23·470	23rd	·228	42·9	50·5	?	37·9	?	44·2	?	12·6	59·2	3rd & 4th	30·0	24th	29·2
	Ranikhet	6,068·75	24·158	+·036	?	24·250	12th	24·042	23rd	·208	45·3	56·3	+2·3	41·7	+2·2	49·0	+2·3	14·6	66·6	3rd	31·5	24th	35·1
	Darjeeling	7,421·	22·986	+·007	?	23·073	3rd	22·884	30th	·189	39·3	47·4	+3·1	35·0	+0·4	41·2	+1·8	12·4	53·9	4th	30·8	11th	23·1
Central India	Mount Abu	3,945	26·158	+·025	?	26·263	2nd	25·959	17th	·304	55·3	64·9	−2·2	50·2	−0·7	57·6	−1·5	14·7	73·1	6th & 7th	35·5	17th	37·6
	Pachmarhi	3,511	26·597	+·034	?	26·680	2nd	26·472	23rd	·208	60·1	72·1	+1·5	47·0	−0·2	59·4	+0·7	25·1	76·3	30th	37·3	2nd	39·0
South India	Wellington	6,200	24·316	+·029	?	24·359	3rd	24·250	29th	·109	53·0	68·2	+2·1	43·1	−2·5	55·7	−0·2	25·1	72·2	8th & 10th.	35·7	5th	36·5
Extra India.																							
Persia	Meshed	?	?	?	?	?	?	?	?	?	25·0	36·8	?	21·9	?	29·4	?	14·9	46·0	2nd	1·5	17th	44·5
	Bushire	14	30·102	?	30·073	30·276	15th	29·838	25th	·438	57·5	64·3	?	54·3	?	59·3	?	10·0	73·8	7th	46·1	16th	27·7
Turkish Arabia	Baghdad	?	29·573	?	?	29·675	27th & 30th.	29·551	16th	·124	54·2	64·0	?	36·6	?	50·3	?	27·4	68·0	3rd	34·0	7th, 10th & 12th.	34·0
Arabia	Aden	94·1	29·975	?	30·003	30·043	7th	29·899	25th	·144	75·3	82·1	?	71·3	?	76·7	?	10·8	85·5	7th & 27th.	67·4	11th & 14th.	18·1

I—*concluded.*

in India, Burma, &c., in January, 1891—concluded.

Wind Direction. Number of winds from									Wind velocity.			Hygrometry, 8 A.M.		Mean cloud amount.	Rainfall.									Station.	Meteorological Province or 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 31st January.	Normal rainfall for period 1st to 31st January.	Variation from normal of period.		
1	6	4	4	4	3	1	2	6	?	?	?	54	·145	3·9	6	...	...	4·65	?	?	4·65	?	?	Mussoorie.	Northern India —*contd.*
23	1	...	6	...	...	1	...	...	3	2	+50	64	·189	4·1	5	...	...	3·75	2·43	+1·32	3·75	2·43	+1·32	Ranikhet.	
18	...	...	5	4	...	2	1	...	4	3	+33	77	174	3·7	1	...	...	0·67	0·31	+0·36	0·67	0·31	+0·36	Darjeeling.	
11	2	5	2	2	...	3	2	4	4	5	−20	47	·205	1·9	2	...	...	1·14	0·33	+0·81	1·14	0·33	+0·81	Mount Abu .	Central India.
6	...	1	5	2	4	2	1	5	3	3	0	52	·268	2·0		...	...	*Nil.*	0·52	−0·52	0	0·52	−0·52	Pachmarhi.	
23	2	2	...	2	2	...	...	...		2	0	59	·239	0·8		...	...	3·35	1·04	+2·31	3·35	1·04	+2·31	Wellington .	South India.
																								Extra India.	
4	3	...	...	5	2	6	6	5	?	?	?	?	?	6·8	1	...	...	0·11	?	?	0·11	?	?	Meshed .	Persia.
...	4	8	11	5	...	...	...	3	7	8	−12	82	391	...	8	...	...	7·96	?	?	7·96	?	?	Bushire.	
...	19	2	...	3	4	...	1	2	5	?	?	76	·320	4·5	4	...	...	1·62	?	?	1·62	?	?	Baghdad .	Turkish Arabia.
3	...	9	12	5	2	...	...	...	11	13	−15	75	·658	4·7	0	...	...	*Nil.*	?	?	0	?	?	Aden.	Arabia.

Table

Abstract of observations recorded at 10 A.M., and 4 P.M., at 82 stations

Station.	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 to 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.
Murree	23·892	23·861	·030	23·867	+·006	?	44·5	33·5	11·0	62·9	22·1	40·8	40·6	40·6	37·5	−1·6	30·1	34·8	36·4	33·8
Chamba	27·080	26·988	·092	27·033	+·020	?	61·8	42·3	19·5	76·4	32·2	44·2	49·2	54·4	49·0	+1·4	39·7	44·0	46·9	43·5
Kailang	20·829	20·780	·049	20·804	+·055	?	31·0	13·3	17·7	41·2	−1·0	42·2	23·0	26·0	19·7	−1·4	12·3	20·0	22·4	18·2
Simla	23·106	23·052	·054	23·069	+·012	?	50·6	37·5	12·9	64·0	24·7	39·3	46·0	47·1	42·8	+2·1	31·5	37·0	40·0	36·4
Peshawar	29·036	28·951	·085	28·982	+·036	30·155	59·0	41·3	17·7	68·2	32·9	35·3	50·6	56·9	48·5	−0·8	39·8	46·5	49·5	45·3
Lahore	·395	29·318	·077	29·346	+·014	·068	63·4	43·5	19·9	69·6	36·2	33·4	54·4	61·2	51·8	0	43·2	51·1	54·3	49·5
Ludhiana	·262	·184	·079	·211	+·004	·048	63·2	44·3	18·9	70·7	36·9	33·8	53·8	61·3	52·4	0	43·6	51·0	54·8	49·8
Mooltan	·715	·613	·102	·652	+·022	·070	67·1	45·8	21·3	73·3	35·2	38·1	55·3	65·1	54·9	+1·1	42·4	50·1	56·9	49·9
Jacobabad	·976	·862	·114	·907	+·035	·065	69·0	46·1	22·9	76·4	35·0	41·4	60·3	67·3	56·0	−0·5	44·4	53·4	55·8	51·2
Kurrachee	30·092	·985	·106	30·029	+·016	·033	74·1	56·0	18·0	82·2	47·1	35·1	65·9	72·4	64·3	−0·7	51·8	57·3	61·3	56·8
Jeypore	28·659	28·562	·097	28·602	+·020	·059	72·8	47·1	25·7	80·7	37·3	43·4	63·5	70·5	58·1	−0·5	43·1	53·1	56·4	50·9
Ajmere	·483	·385	·098	·427	+·017	·076	71·6	46·3	25·3	80·1	35·0	45·1	60·6	69·9	58·0	+0·5	42·8	52·4	57·7	51·0
Mount Abu	26·186	26·112	·074	26·137	+·006	?	64·6	50·1	14·5	73·3	35·5	37·8	60·7	61·4	56·6	−0·9	43·0	48·6	49·8	47·1
Chakrata	23·363	23·309	·055	23·321	+·063	?	52·6	38·0	14·5	64·8	28·4	36·4	44·6	47·1	43·4	+1·8	33·4	39·4	40·1	37·6
Ranikhet	24·181	24·121	·059	24·136	+·023	?	55·8	41·7	14·1	66·6	31·5	35·1	50·7	52·3	47·4	+1·3	36·6	43·8	45·6	42·0
Pithoragarh	·840	·776	·064	·793	+·032	?	60·4	42·2	18·3	69·8	35·2	34·6	52·0	57·9	50·2	+2·1	38·7	46·6	48·4	44·5
Dehra	27·797	27·718	·079	27·748	+·010	·032	67·7	46·2	21·5	74·2	40·2	34·0	55·1	63·6	55·4	+0·5	45·0	50·6	53·6	49·8
Roorkee	29·186	29·093	·093	29·129	+·008	·037	67·4	45·8	21·5	75·8	37·4	38·4	55·4	65·2	55·6	−0·2	44·6	52·2	56·2	51·0
Meerut	·360	·264	·097	·303	+·016	·052	68·6	45·9	22·7	75·7	38·0	37·7	56·6	66·2	56·1	+0·1	45·2	51·4	55·2	50·6
Agra	·574	·468	·106	·509	+·026	·056	73·1	47·8	25·3	80·8	39·6	41·2	60·7	71·9	59·7	+1·0	44·3	52·8	57·1	51·4
Lucknow	·739	·629	·109	·675	+·002	·023	73·4	47·1	26·3	79·7	39·9	39·8	62·3	71·1	61·1	+0·3	45·4	55·3	58·2	53·0
Allahabad	·819	·702	·117	·747	+·012	·027	74·5	46·4	28·1	82·9	40·2	42·7	63·5	73·1	59·4	−1·1	45·3	55·9	58·8	53·3
Ghazipur	·910	·782	·128	·835	+·011	·020	73·9	51·5	22·4	80·1	43·5	36·6	65·0	70·8	60·9	+1·7	45·6	58·2	59·9	54·6
Nowgong	·342	·220	·122	·271	0	·024	74·0	46·1	27·9	84·0	38·5	45·5	62·2	72·8	59·5	−0·9	44·8	53·8	58·8	52·5
Sutna	·040	28·919	·121	28·970	+·001	·019	75·2	46·5	28·7	83·5	40·2	43·3	65·6	74·3	59·8	−0·3	44·2	54·2	57·0	51·8
Durbhunga	·952	29·823	·130	29·879	−·001	·007	73·6	52·1	21·5	78·6	45·4	33·2	65·2	72·1	62·2	+0·3	51·7	60·0	61·9	57·9
Patna	·930	·809	·121	·861	−·009	·005	72·7	50·9	21·8	77·9	45·4	32·5	64·8	70·8	61·0	+0·6	49·4	58·3	60·7	56·1
Hazaribagh	28·045	27·951	·095	27·990	+·007	·016	73·4	50·8	22·6	79·4	46·3	33·1	64·9	71·2	61·1	+0·4	46·5	54·7	56·1	52·5
Darjeeling	23·010	22·940	·070	22·969	+·010	?	47·6	34·9	12·6	53·9	30·8	23·1	43·9	45·2	40·7	+1·6	32·7	39·6	42·3	38·2
Pedong	Register very incomplete.																			
Berhampore	30·042	29·914	·128	29·967	+·001	29·985	76·0	54·5	21·5	81·6	51·2	30·4	66·5	74·6	64·5	−0·2	53·8	61·1	63·7	59·5
Burdwan	·029	·893	·136	·949	+·008	·993	78·1	55·3	22·8	82·5	50·3	32·2	68·4	76·2	65·9	0	53·8	59·3	61·9	58·3
Calcutta (Alipore)	·094	·960	·134	30·017	−·001	·984	77·1	54·5	22·6	81·6	50·7	30·9	68·8	76·3	64·9	−0·2	54·1	60·9	62·5	59·2
Calcutta (Chowringhee)	·098	?	?	?	?	?	78·1	55·9	22·2	82·9	52·1	30·8	69·9	?	67·0	?	55·1	62·6	?	?
Saugor Island	·081	·952	·129	·007	−·002	·977	76·8	58·3	18·4	80·3	53·8	26·5	70·6	75·2	66·8	−0·3	56·0	63·9	65·2	61·7
Dacca	·059	·939	·121	29·992	−·018	·962	78·7	56·0	22·7	81·6	52·9	28·7	69·6	76·6	67·4	+1·4	54·0	62·7	64·5	60·4
Chittagong	29·987	·874	·113	·927	−·022	·965	78·8	54·7	24·0	83·1	52·4	30·7	70·1	75·4	66·3	+0·3	53·9	63·5	65·3	60·9
Demagiri	Not recorded.						76·0	54·2	21·7	78·2	50·3	27·9	64·5	75·5	65·0	+1·7	Not recorded.			
Tura	Ditto.						73·6	60·2	13·4	77·1	51·4	25·7	67·2	70·1	66·0	?	?	59·8	61·1	?
Dhubri	·985	·842	·143	·907	−·022	·983	73·8	53·6	20·2	78·6	48·5	30·1	62·2	73·0	62·4	+0·3	53·1	58·8	63·1	58·3
Sibsagar	·746	·588	·158	·665	−·070	·971	71·0	48·9	22·1	75·2	44·1	31·1	58·6	69·7	58·9	+1·3	48·8	58·1	62·5	56·5
Silchar	·989	·851	·138	·921	−·016	·981	80·0	51·1	28·9	84·3	46·7	37·6	65·5	78·3	64·5	+1·4	49·7	60·7	64·1	58·3

II.

in India, Burma, &c., in January, 1891.

Vapour tension.					Humidity.					Cloud.				Wind direction.											Wind steadiness.		Wind velocity.		Station.
															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 mean.	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.	
·134	·145	·174	·151	+·011	74	63	73	70	+11	7·4	8·2	7·8	+1·9	8	1	1	14	35	3	...	...	...	S. 57° E.	S. 54° E.	76	35	291	199	Murree.
·218	·232	·241	·230	+·009	80	67	58	69	0	6·1	7·5	6·8	+0·5	32	3	...	2	9	7	2	2	5	S. 10° E.	S. 71° E.	13	17	56	57	Chamba.
·074	·087	·094	·085	−·010	88	69	79	74	− 2	6·8	8·0	7·4	+0·2	...	7	1	3	9	4	9	28	1	N. 60° W.	S. 68° W.	46	48	15	18	Kailang.
·115	·131	·178	·140	−·013	54	46	57	50	−10	5·2	7·3	6·2	+0·7	2	1	4	14	13	10	13	4	1	S. 27° E.	S. 31° W.	43	19	?	48	Simla.
·229	·268	·265	·254	+·029	88	73	59	73	+11	6·0	6·0	6·0	+1·1	21	3	2	1	6	8	6	6	9	S. 60° W.	S. 11° E.	18	7	63	59	Peshawar.
·279	·335	·334	·316	+·051	97	79	62	79	+18	5·5	5·7	5·6	+2·2	21	10	2	4	5	3	1	4	12	N. 19° W.	N. 25° W.	22	21	39	45	Lahore.
·280	·340	·345	·322	+·041	95	82	64	80	+13	5·3	5·8	5·6	+1·5	14	11	1	2	1	1	...	22	10	N. 56° W.	N. 56° W.	50	25	50	28	Ludhiana.
·225	·298	·361	·296	+·039	71	68	58	68	+ 7	4·6	4·7	4·7	+1·9	12	3	8	1	...	...	13	...	25	N. 50° W.	N. 9° W.	43	24	22	38	Mooltan.
·272	·322	·299	·318	+·104	87	61	45	71	+25	3·9	4·1	4·0	+1·2	25	1	3	6	5	2	...	3	17	N. 19° W.	N. 10° W.	16	27	45	50	Jacobabad.
·335	·263	·407	·369	+·025	74	57	51	61	+ 6	2·8	2·4	2·6	−0·1	...	...	30	12	1	...	6	5	8	N. 41° E.	N. 23° W.	47	17	271	241	Kurrachee.
·235	·281	·286	·267	−·007	72	48	39	53	0	2·8	3·2	3·0	−0·1	3	6	5	6	3	2	8	12	17	N. 59° W.	N. 20° E.	35	21	72	92	Jeypore.
·239	·300	·334	·291	+·026	74	57	46	59	+ 8	2·2	2·9	2·6	+0·2	15	1	10	1	2	5	11	2	15	N. 68° W.	N. 82° E.	19	8	40	47	Ajmere.
·203	·210	·226	·221	+·026	55	40	42	48	+ 8	1·7	2·8	2·2	−0·4	1	6	14	3	9	1	9	10	9	N. 22° W.	N. 83° W.	15	6	103	116	Mount Abu.
·146	·157	·179	·161	+·005	66	51	56	59	− 4	4·8	5·1	5·0	+0·2	12	2	20	5	...	...	6	17	...	N. 10° W.	S. 66° W.	19	9	129	111	Chakrata.
·165	·219	·240	·208	+·016	65	60	63	63	0	4·5	5·5	5·0	+0·9	36	...	1	12	2	1	9	1	...	S. 40° E.	S. 70° W.	17	17	62	41	Ranikhet.
·197	·267	·235	·233	+·016	73	68	51	64	− 2	4·7	4·2	4·5	−0·1	43	...	2	...	2	3	11	1	...	S. 29° W.	S. 47° E.	20	16	63	52	Pithoragarh.
·284	·317	·291	·297	?	92	74	52	73	?	3·9	4·7	4·3	?	21	5	3	2	4	4	3	11	9	N. 70° W.	S. 75° W.	21	17	53	43	Dehra.
·282	·352	·335	·323	+·038	91	80	55	75	+10	2·4	3·3	2·8	−0·7	16	...	2	3	5	3	1	29	3	S. 81° W.	N. 72° W.	39	16	70	52	Roorkee.
·295	·314	·298	·303	+·017	95	69	48	70	+ 6	3·6	3·2	3·4	+0·1	15	...	1	5	3	...	4	20	14	N. 77° W.	N. 49° W.	41	45	58	51	Meerut.
·249	·299	·274	·274	−·017	74	57	36	55	− 2	2·3	1·7	2·0	−0·4	...	3	6	...	5	1	6	3	38	N. 46° W.	N. 64° W.	59	35	103	82	Agra.
·286	·347	·318	·317	+·016	87	62	43	64	+ 4	2·7	2·0	2·3	−0·6	4	1	4	5	4	1	9	22	12	N. 85° W.	N. 57° W.	42	41	84	57	Lucknow.
·290	·351	·312	·318	−·025	92	63	39	65	− 3	1·8	1·9	1·9	−0·2	1	4	5	3	6	1	1	21	20	N. 58° W.	N. 34° W.	48	20	96	49	Allahabad.
·242	·399	·376	·339	+·001	64	65	50	60	− 1	1·3	1·2	1·2	−1·0	24	1	...	4	1	1	25	4	2	S. 47° W.	S. 76° W.	40	38	37	39	Ghazipur.
·284	·309	·314	·303	+·010	90	56	40	62	+ 4	1·9	2·0	2·0	−1·0	5	6	...	6	2	1	4	20	18	N. 64° W.	N. 24° W.	50	22	38	32	Nowgong.
·270	·286	·255	·270	−·009	84	46	30	53	+ 1	0·9	0·8	0·9	−1·3	...	19	1	2	...	8	1	8	23	N. 39° W.	N. 16° W.	57	27	113	99	Sutna.
·382	·453	·421	·416	+·019	97	69	54	75	+ 3	0·4	0·5	0·5	−1·1	13	1	1	4	3	...	17	20	3	S. 69° W.	S. 80° W.	47	47	77	59	Durbhunga.
·337	·404	·400	·380	+·019	90	66	54	70	+ 3	1·2	1·0	1·1	−1·4	9	1	2	5	3	3	...	37	2	S. 88° W.	N. 83° W.	48	45	73	49	Patna.
·268	·305	·267	·280	+·012	72	50	36	53	+ 2	1·4	1·0	1·2	−1·2	...	10	2	1	2	4	1	12	30	N. 49° W.	N. 62° W.	65	54	184	118	Hazaribagh.
·165	·201	·239	·201	−·001	82	72	80	78	− 2	3·9	5·7	4·8	−0·8	40	...	2	2	3	1	5	7	2	S. 59° W.	S. 84° W.	12	22	88	62	Darjeeling.
Register very incomplete.																													Pedong.
·405	·466	·446	·439	+·049	95	72	53	73	+ 3	0·8	0·8	0·8	−1·4	1	20	2	1	1	1	2	18	16	N. 43° W.	N. 41° W.	65	50	44	43	Berhampore.
·397	·392	·366	·385	−·009	90	57	41	63	0	1·2	1·2	1·2	−1·6	3	29	1	4	1	...	3	8	13	N. 21° W.	N. 32° W.	62	46	45	43	Burdwan.
·418	·435	·385	·413	−·021	97	62	43	67	− 4	0·6	0·5	0·6	−0·9	...	30	7	4	1	1	3	1	15	N. 6° W.	N. 38° W.	68	38	46	68	Calcutta (Alipore).
·462	·472	?	?	?	95	64	?	?	?	Not recorded.																			Calcutta (Chowringhee).
·424	·507	·491	·474	−·054	86	68	56	70	− 6	1·0	1·1	1·0	−0·7	...	38	8	1	1	4	4	1	5	N.	N. 1° E.	64	19	202	151	Saugor Island.
·393	·479	·447	·440	+·007	87	66	49	67	− 2	0·2	0·9	0·6	−1·0	2	12	6	1	1	4	3	17	16	N. 50° W.	N. 53° W.	52	32	75	50	Dacca.
·407	·499	·490	·465	+·001	95	68	56	73	+ 1	0·4	0·4	0·4	−1·0	...	10	16	2	...	...	2	19	13	N. 29° W.	N. 24° W.	54	48	44	89	Chittagong.
?	?	?	?	?	?		?	?	?	0·3	0	0·1	−0·5	1	...	1	5	14	6	27	7	1	S. 18° W.	N. 50° W.	57	34	?	?	Demagiri.
?	·433	·436	?	?	?	65	60	?	?	2·1	2·6	2·3	−0·5	...	..	1	7	15	8	24	6	1	S. 9° W.	S. 4° W.	56	53	?	?	Tura.
·396	·458	·449	·434	+·013	96	80	56	77	+ 1	0·6	1·0	0·8	−1·0	16	5	15	14	3	...	8	1	...	N. 69° E.	N. 74° E.	35	20	109	93	Dhubri.
·349	·477	·471	·432	+·011	99	96	65	87	+ 1	7·5	3·7	5·6	+0·2	...	1	32	6	12	1	8	...	2	N. 72° E.	N. 61° E.	51	51	32	43	Sibsagar.
·351	·470	·411	·411	−·012	93	75	43	70	− 4	1·7	1·8	1·8	−1·3	30	...	2	12	7	4	4	2	1	S. 53° E.	S. 29° E.	26	27	13	48	Silchar.

Table

Abstract of observations recorded at 10 A.M., and 4 P.M., at 82 stations

Station.	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. Land to 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.
False Point	30·080	29·965	·114	30·018	—·014	29·981	79·2	56·3	22·9	85·2	50·9	34·3	74·5	76·4	66·7	—1·4	55·7	66·7	67·1	63.2
Cuttack	·032	·897	·135	29·961	0	29·986	84·8	59·3	25·5	88·4	52·9	35·5	73·4	83·5	71·1	+0·3	57·6	63·7	66·1	62·5
Sambalpur	29·621	·482	·139	·548	+·004	29·974	84·1	56·7	27·4	87·0	46·8	40·2	72·1	82·1	69·2	+2·0	51·4	61·8	63·7	59·0
Raipur	·111	28·974	·137	·034	+·004	29·973	81·7	55·4	26·2	86·0	49·3	36·7	71·3	80·7	67·6	+0·8	51·4	59·5	61·7	57·5
Khandwa	·027	·900	·127	28·956	+·020	29·990	83·9	50·1	33·8	89·1	42·5	46·6	71·9	83·1	66·1	—0·7	44·5	57·0	61·5	54·3
Hoshangabad	·076	·940	·136	29·000	+·006	30·014	80·7	52·1	28·6	86·3	45·6	40·7	66·8	79·4	65·3	−0·4	47·6	56·8	62·7	55·8
Saugor	28·305	·193	·112	28·241	+·010	30·014	78·1	51·1	27·0	82·3	44·0	38·3	67·0	75·2	63·1	−0·2	45·5	54·3	58·9	52·9
Jubbulpore	·752	·626	·126	·682	+·026	30·034	77·1	46·7	30·3	82·7	38·9	43·8	64·9	75·8	60·9	−0·8	45·3	56·2	60·2	53·9
Pachmarhi	26·612	26·524	087	26·568	+·023	?	72·4	Imperfect.		76·3	?	?	66·7	69·1	?	?	?	53·0	54·0	?
Nagpur	29·059	28·923	·137	28·983	+·027	29·994	81·7	54·8	26·9	87·0	48·4	38·6	71·2	80·5	67·3	−0·9	50·7	59·8	62·8	57·8
Chanda	·447	29·315	·132	29·373	+·006	·976	85·0	52·8	32·1	87·8	44·1	43·7	74.0	81·4	67·3	−1·1	51 8	62·7	64·7	59·7
Sironcha	·680	·551	·129	·608	−·016	·966	85·2	57·1	28·0	89·9	48·4	41·5	74·3	83·4	70·0	−1·0	55·1	65·5	67·5	62·7
Chikalda	26·476	26·380	·096	26·420	+·003	?	74·5	56·1	18·4	80·1	47·8	32·3	67·6	72·3	63·0	+0·8	48·4	54·9	56·9	53·4
Buldana	27·906	27·794	·112	27·841	−·003	·951	81·8	58·0	23·9	86·2	51·3	34·9	75·3	79·1	68·5	+0·1	49·2	57·8	58·6	55·2
Akola	29·152	29·013	·139	29·074	+·016	·984	85·8	52·3	33·5	91·5	44·9	46·6	72·8	84·7	68·1	+0·1	48·4	59·4	63·6	57·2
Makhla	Not recorded.						77·3	56·5	20·8	83·9	49·5	34·4	66·7	75·1	65·7	+1·5	51·1	56·1	60·5	55·9
Deesa	·622	·513	·108	·555	+·014	·992	83·5	51·9	31·5	91·7	40·0	51·7	72·7	81·4	67·7	+0·4	46·5	56·1	59·4	54·0
Bombay	30·033	·914	·131	·964	+·012	·941	83·4	67·5	15·9	90·0	61·5	28·5	74·7	79·6	74·1	+1·0	59·8	66·1	69·7	65·2
Poona	28·221	28·088	·133	28·152	+·018	·971	86·3	51·9	34·4	90·0	45·9	44·1	75·1	84·2	68·7	−0·3	47·9	57 8	59·7	55·1
Sholapur	·462	·321	·141	388	−·001	·947	88·0	57·5	30·5	92·7	47·9	44·8	77·6	86·7	72·1	+0·3	52·4	64·3	67·3	61·3
Ratnagiri	29·940	29·820	·120	29·871	+·016	·920	89·3	64·6	24·7	96·8	60·2	36·6	84·5	83·3	75·1	0	58·0	66·4	70·4	64·9
Karwar	·992	·871	·122	·922	+·001	·899	86·9	65·3	21·6	91·7	58·1	33·6	76·5	84·3	75·0	−0·3	62·7	67·7	72·1	67·5
Belgaum	27·503	27·380	·123	27·436	−·002	·907	83·1	56·9	26·2	86·7	50·5	36·2	74·7	81·9	69·6	−0·3	52·5	59·6	59·9	57·3
Secunderabad	28·269	28·138	·131	28·201	+·017	·958	85·8	58·3	27·5	90·2	49·3	40·9	75·1	83·4	71·1	+0·1	56·0	62·8	64·5	61·1
Vizagapatam	30·069	29·950	·119	30·000	+·005	·969	78·7	66·6	12·2	81·5	61·0	20·5	76·6	79·0	72·3	−3·4	61·2	67·4	68·3	65·6
Bellary	28·573	28·435	·138	28·501	+·020	·940	86·9	59·7	27·2	90·8	51·0	39·8	77·3	84·9	72·5	−0·7	57·2	67·9	69·3	64·8
Madras	Not received.																			
Salem	29·135	28·989	·146	29·068	+·016	·958	89·7	63·9	25·8	92·3	58·9	33·4	79·8	87·2	75·5	+1·3	62·6	71·9	74·8	69·8
Mercara	26·315	26·212	·103	26·263	−·044	·942	79·2	54·2	25·0	83·3	51·0	32·3	66·6	73·2	64·7	−1·3	50·9	58·9	62·1	57·3
Trichinopoly	29·790	29·645	·145	29·723	−·001	·913	89·3	66·9	22·4	91·8	62·5	29·3	81·9	87·0	76·8	+1·3	64·9	70·2	70·7	68·6
Cochin	30·008	·876	·132	·933	+·011	·871	88·0	69·7	18·3	91·2	65·8	25·4	83·2	84·8	77·7	−1·0	68·1	72·1	74·2	71·5
Wellington	24·323	24·252	·07 1	24·288	+·017	...	68·1	43·1	24·9	72·4	35·6	36·8	62·1	64·1	56·4	+1·3	39·9	50·3	54·9	48·4
Akyab	30·041	29·921	·120	29·975	−·026	·938	82·6	60·9	21·7	86·3	58·5	27·8	72·3	78·2	71·1	+1·0	55·3	64·8	67·4	62·5
Diamond Island	29·983	·864	·119	·920	−·045	·896	85·2	68·8	16·3	87·8	66·6	21·2	79·1	81·9	75·8	0	65·2	70·2	71·8	69·0
Rangoon	·980	·838	·142	·909	−·047	·887	91·7	63·4	28·3	95·0	59·2	35·8	77·0	88·1	74·9	+1·2	60·6	67·6	69·8	66·0
Mergui	·874	·769	·105	·818	−·039	·845	88·9	65·6	23·3	93·1	60·3	32·8	83·3	85·9	76·5	−1·4	64·0	74·7	76·4	71·7
Cocos Island	·905	·799	·106	·849	?	?	83·4	71·2	12·2	85·4	68·9	16·5	81·4	79·6	76·0	?	68·7	73·5	71·8	71·3
Port Blair	·930	·821	·109	·871	−·025	·863	86·9	75·5	11·4	89·3	71·8	17·5	82·6	84·8	80·3	+0·9	71·3	76·3	76·9	74·8
Quetta	24·700	24·629	·071	24·655	+·001	...	48·3	30·3	18·0	62·3	16·9	45·4	40·0	44·8	38·4	−1·5	31·3	36·2	39·0	35·5
Leh	19·685	19·614	·071	19·651	+·026	?	31 0	10·7	20 2	39·8	2·0	37·8	22·0	25·8	19·3	+0·9	9·9	18·7	22·2	12·7
Katmandu	25·776	25·662	·114	25·713	+·026	?	74·8	36·6	38·2	78·6	29·0	49·6	48·4	65·9	53·4	+3·1	34·8	44·9	56·9	45·5
Amini Divi	Not received.																			
Aden	29·964	29·871	·113	29·928	−·019	·955	82·3	71·2	11·0	85·5	67·4	18·1	78·1	79·5	76·1	+0·2	67·9	70·9	70·6	69·8

II—*continued.*

in India, Burma, &c., for January, 1891—continued.

Vapour tension.					Humidity.					Cloud.				Wind direction.											Wind steadiness.		Wind velocity.		Station.
														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 mean.	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.	
·441	·565	·544	·517	−·016	96	65	60	74	− 5	2·1	1·1	1·6	−0·4	...	13	20	8	11	3	...	1	6	N. 50° E.	N. 51° E.	52	22	150	147	False Point.
·458	·463	·411	·444	−·032	90	56	36	61	− 4	1·5	1·0	1·2	−0·6	13	9	16	5	...	4	6	6	3	N. 16° E	N. 45° E.	24	11	29	34	Cuttack.
·315	·418	·347	·360	−·080	68	53	32	51	−14	0·8	0·5	0·6	−0·8	...	14	14	6	1	2	6	11	8	N. 11° W.	N. 48° W.	37	30	67	39	Sambalpur.
·331	·356	·300	·329	−·029	75	47	29	50	− 4	1·2	1·4	1·3	−0·2	9	5	16	9	...	2	7	7	7	N. 13° E.	N. 5° E.	24	21	71	66	Raipur.
·227	·285	·281	·264	−·073	62	36	25	41	−10	0·3	0·7	0·5	−1·1	...	11	23	6	3	5	1	7	6	N. 28° E.	N. 25° E	43	23	65	70	Khandwa.
·277	·342	·364	·328	−·016	71	52	36	53	− 1	1·2	1·2	1·2	−0·7	5	3	11	31	3	2	5	1	1	N. 84° E	N. 59° E.	58	39	102	57	Hoshangabad.
·241	·272	·300	·271	−·002	66	41	34	47	− 1	1·0	0·8	0·9	−0·6	...	2	25	4	9	6	4	3	9	N. 56° E.	N. 13° E.	31	24	109	66	Saugor.
·289	·346	·331	·322	−·007	90	56	37	61	+ 1	0·8	1·0	0·9	−1·3	10	8	13	1	3	6	1	8	12	N. 16° W.	N. 8° E.	28	17	40	51	Jubbulpore.
?	·248	·245	?	?	?	39	35	?	?	1·7	2·3	2·0	?	1	5	7	6	2	5	3	8	9	N. 28° W.	N. 68° W.	14	13	73	73	Pachmarhi.
·323	·377	·354	·351	−·004	74	49	34	52	0	1·2	1·0	1·1	−1·2	8	12	18	11	4	8	1	...	...	N. 63° E.	N. 72° E.	47	30	93	73	Nagpur.
·379	·424	·391	·398	−·016	93	50	37	60	+ 1	0·5	1·6	1·0	−1·0	6	11	5	17	4	6	...	7	6	N. 51° E.	S. 88° E.	25	23	41	50	Chanda.
·417	·516	·464	·465	+·004	88	60	41	63	+ 1	0·9	0·8	0·8	−0·6	48	5	1	...	1	4	1	1	1	N. 45° W.	S. 75° E.	2	14	9	44	Sironcha.
·254	·289	·288	·300	−·015	56	44	37	52	− 1	1·5	1·9	1·7	−0·3	26	6	1	1	6	10	3	3	6	S. 32° W.	S. 47° W.	10	26	129	116	Chikalda.
·245	·265	·241	·274	−·052	51	30	24	39	− 7	0·3	0·7	0·5	−1·8	25	5	10	8	6	3	2	1	2	N. 73° E.	N. 76° E.	25	21	74	135	Buldana.
·293	·332	·313	·327	+·001	74	42	27	48	− 1	1·3	1·6	1·4	0	5	6	21	9	7	...	...	4	10	N. 38° E.	N. 54° E.	47	30	96	82	Akola.
?	?	?	?	?	?	?	?	?	?	1·3	1·4	1·4	−1·6	...	17	6	10	5	20	2	2	...	S. 76° E.	S. 80° W.	24	29	?	?	Makhla.
·251	·235	·220	·241	−·022	63	30	21	35	− 3	2·3	2·8	2·5	+0·2	...	7	17	9	2	5	4	8	10	N. 15° E.	N. 3° W.	28	39	220	207	Deesa.
·481	·529	·597	·536	−·041	71	61	59	64	− 6	0·4	0·1	0·3	−1·2	...	6	11	16	1	...	...	10	18	N. 4° E.	N. 6° E.	42	63	244	243	Bombay.
·287	·267	·212	·270	−·058	74	30	18	38	− 4	0·3	1·0	0·6	−1·3	18	...	1	21	11	...	5	2	4	S. 70° E.	S. 63° E.	36	24	137	138	Poona.
·336	·440	·430	·412	+·069	70	46	34	52	+ 8	0·7	1·9	1·3	−0·8	...	2	4	27	18	3	5	1	2	S. 70° E.	S. 60° E.	63	55	180	172	Sholapur.
·397	·411	·571	·483	−·079	65	35	50	56	− 5	0·1	0·1	0·1	−0·5	...	5	1	10	4	6	3	8	25	N. 49° W.	N. 34° W.	31	30	193	228	Ratnagiri.
·541	·563	·624	·575	−·024	86	62	53	66	− 4	0·2	0·2	0·2	−0·7	2	...	14	1	...	...	...	17	28	N. 41° W.	N. 5° W.	64	53	60	?	Karwar.
·346	·326	·247	·322	−·034	74	38	23	44	− 3	0·5	0·9	0·7	−1·0	...	3	6	26	15	3	4	...	1	S. 77 E.	S. 71° E.	66	50	269	261	Belgaum.
·429	·419	·379	·408	0	86	49	33	56	+ 1	1·1	2·1	1·6	−0·1	1	1	21	31	4	2	1	1	...	N. 77 E.	S. 87° E.	77	69	86	93	Secunderabad.
·468	·556	·561	·528	−·054	71	60	57	66	+ 1	1·4	0·8	1·1	−0·6	...	16	12	13	3	6	2	7	3	N. 37° E.	S. 60° E.	35	42	36	2	Vizagapatam.
·444	·573	·525	·514	+·110	86	61	45	64	+14	1·1	1·3	1·2	−1·0	42	...	2	8	9	1	...	...	...	S. 69 E.	S. 69° E.	27	68	74	81	Bellary.
Not received.																													
·554	·681	·701	·645	+·082	92	67	55	71	+ 6	2·1	3·6	2·8	+0·3	...	1	24	28	7	...	2	...	...	N. 77 E.	S. 84° E.	80	61	81	118	Salem
·340	·412	·437	·396	−·030	80	63	54	66	− 4	3·6	4·2	3·9	+0·9	..	...	13	49	...	...	...	...	...	N. 81 E.	N. 68° E.	95	60	79	102	Mercara.
·594	·586	·536	·572	−·038	90	54	42	62	− 7	3·3	3·3	3·3	−1·0	...	6	40	14	1	...	...	...	1	N. 51 E.	N. 45° E.	88	78	133	114	Trichinopoly.
·669	·648	·700	·672	−·016	92	57	58	69	− 1	0	1·2	0·6	−3·5	17	3	8	6	1	...	19	7	1	S. 61 W.	S. 11° W.	16	13	?	?	Cochin.
·219	·247	·337	·268	−·036	76	46	57	59	−10	1·0	1·9	1·4	−1·9	3	...	3	8	33	12	3	...	...	S. 42 E.	S. 14° E.	76	62	52	53	Wellington.
·364	·515	·529	·489	−·026	67	65	55	63	− 8	0·1	0	0·1	−1·5	...	10	18	3	...	...	...	7	24	N. 12 W.	N. 23° W.	65	39	59	65	Akyab.
·577	·622	·646	·615	−·022	82	62	59	68	− 3	0·9	1·2	1·1	−1·3	...	31	11	...	...	...	...	...	20	N. 7 W.	N. 6° E.	86	74	115	153	Diamond Island.
·493	·553	·487	·511	−·051	84	60	37	60	− 5	0·2	0·7	0·5	−1·7	...	20	32	3	2	1	...	2	1	N. 31° E.	N. 25° E.	78	42	92	100	Rangoon.
·577	·745	·784	·702	−·006	91	66	64	74	0	0·9	2·8	1·9	−0·5	...	14	11	6	6	1	1	1	22	N. 1° E.	N. 12° W.	50	59	63	47	Mergui.
·672	·722	·677	·688	?	88	67	67	74	?	2·5	3·1	2·8	?	...	36	21	1	...	...	...	1	3	N. 14 E.	?	88	?	?	?	Cocos Island.
·711	·823	·821	·785	−·009	81	74	68	74	− 3	3·2	4·0	3·6	+0·4	...	21	27	3	2	1	...	...	4	N. 27 E.	N. 39° E.	73	78	150	160	Port Blair.
·178	·175	·180	·178	+·008	100	71	60	77	+ 9	4·8	4·9	4·8	+0·6	43	...	1	...	1	4	4	5	4	S. 67 W.	N. 83° W.	16	27	28	88	Quetta.
·064	·078	·092	·078	+·008	88	66	65	73	+ 8	7·4	7·8	7·6	+1·0	15	...	5	4	1	8	25	4	...	S. 30 W.	S. 8° E.	43	24	9	24	Leh.
·186	·262	·364	·271	+·022	84	78	57	73	0	1·9	3·1	2·5	−0·8	21	3	1	3	1	3	2	16	12	N. 72 W.	N. 87° W.	36	68	20	?	Katmandu.
Not received.																													Amini Divi.
·639	·661	·631	·644	+·001	84	69	63	72	0	4·3	1·2	2·7	−1·3	3	2	12	28	9	5	1	1	...	S. 88 E.	N. 84° E.	67	70	323	311	Aden.

b

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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 a difference 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.

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, &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, represent the line of no variation, the dotted line facing the area of deficient pressure or negative abnormals.

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Litho. S I O. Calcutta.

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

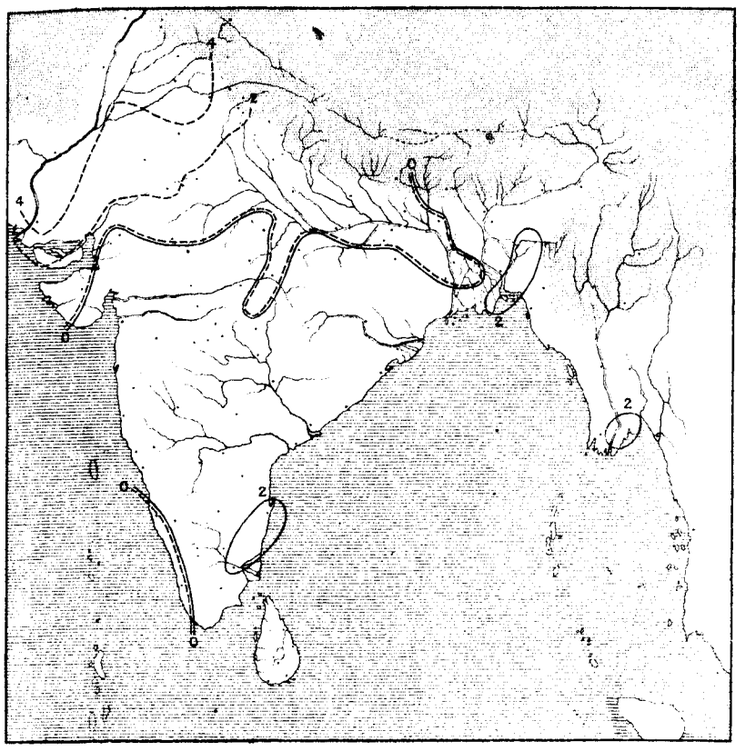
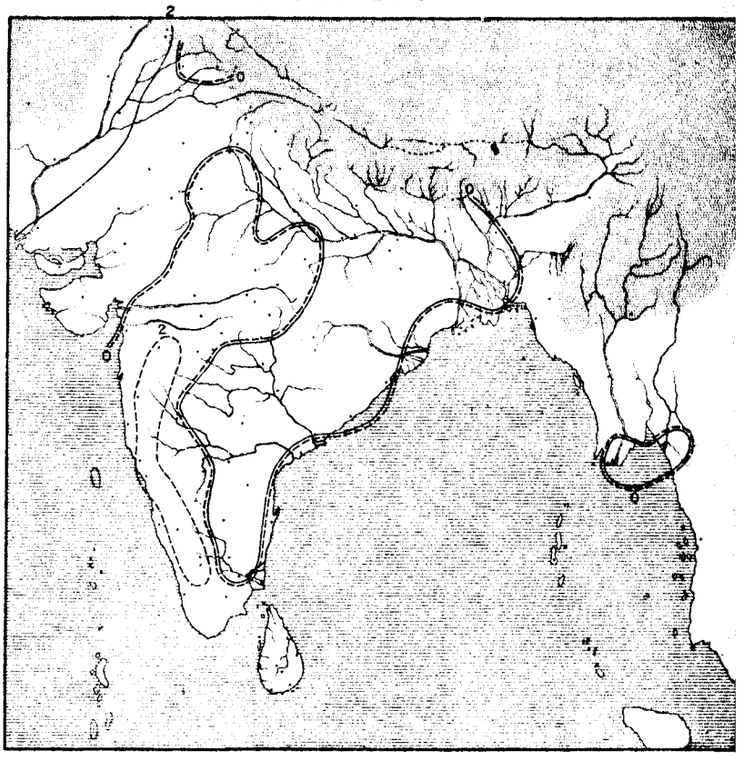


CHART SHEWING THE VARIATION OF THE MEAN MINIMUM TEMPERATURE OF THE MONTH FROM THE NORMAL.



Explanation.

Continuous lines indicate that the mean maximum of the month was in excess by the 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 the month was in excess by the 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

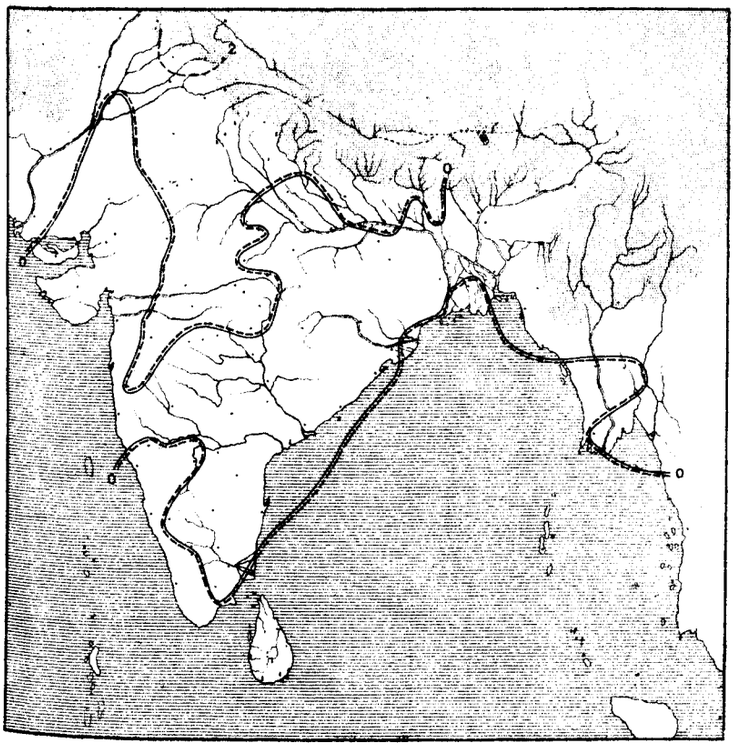
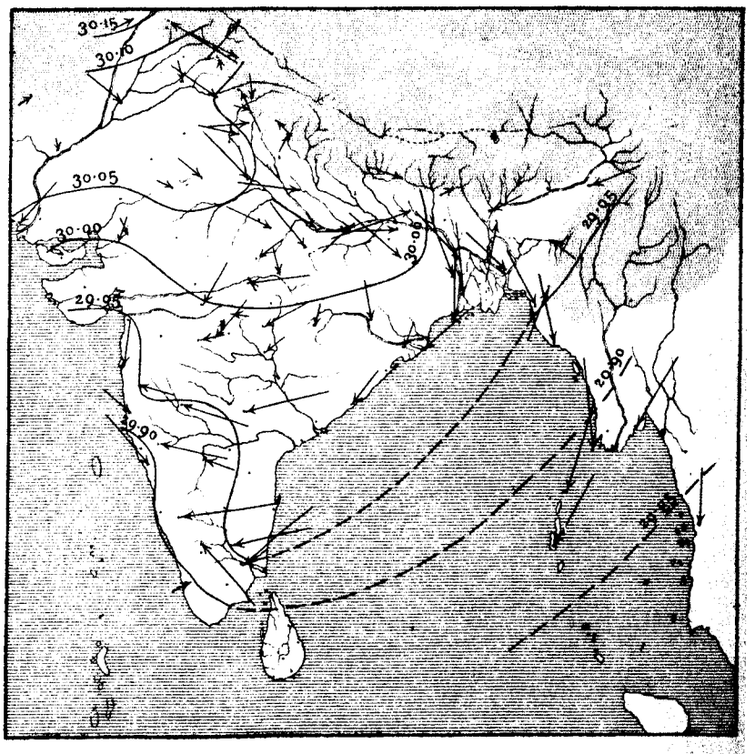


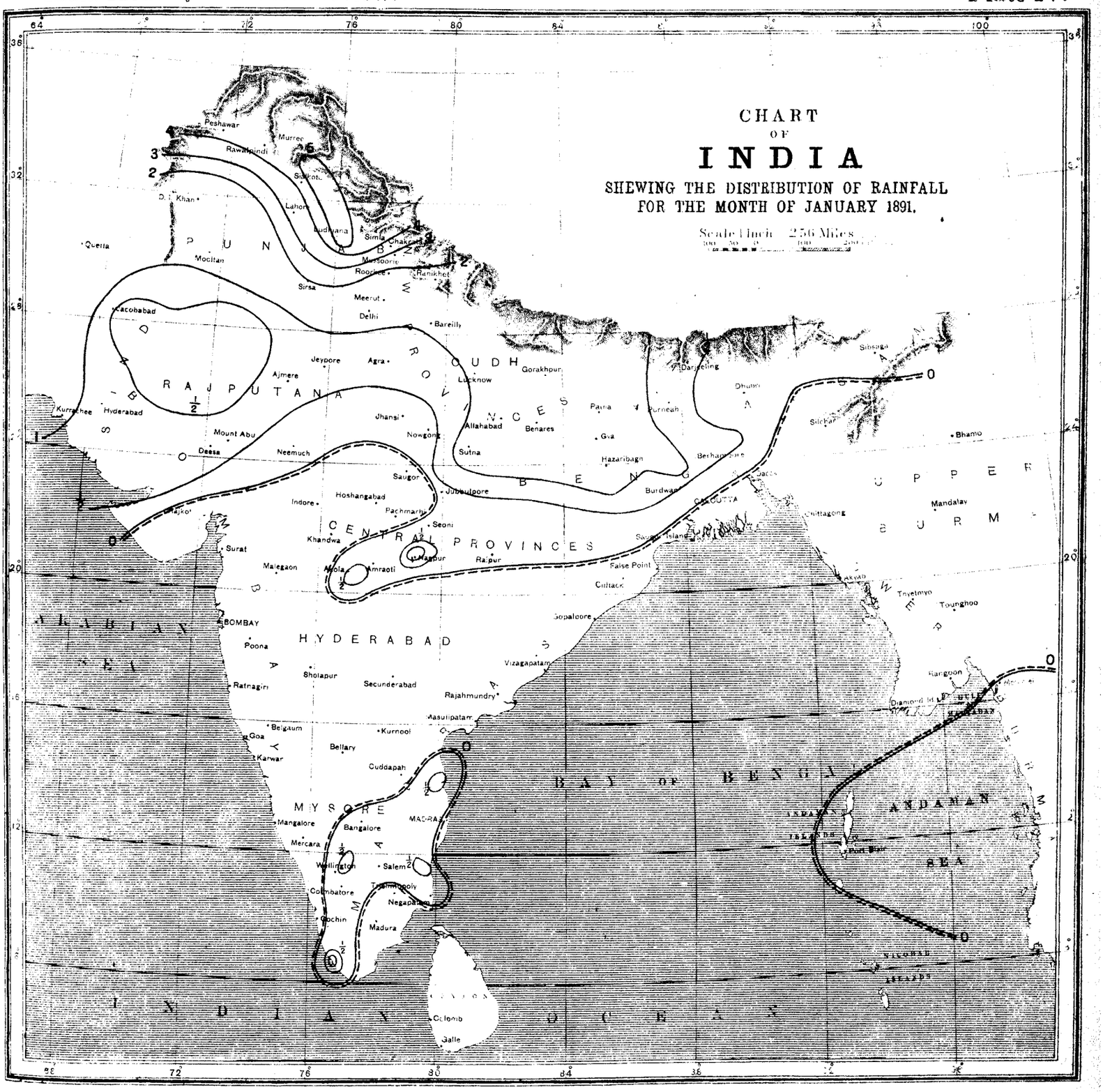
CHART SHEWING THE MEAN DISTRIBUTION OF PRESSURE AND THE RESULTANT WIND DIRECTIONS IN THE MONTH OF JANUARY 1891.



Explanation.

Continuous lines indicate that the mean daily temperature of the month was in excess by the amounts indicated by the attached numbers. Broken or

The Chart is prepared in the same manner as the Monthly Charts which have hitherto appeared in the Annual Report, the only alteration made



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. The double line or line of no rainfall separates areas in which the area 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. 202, Wr., I.—June 91.—415.

Litho., 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 51 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 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
3. Central do.
4. Upper do.
5. Arakan
6. Eastern Bengal
7. Assam (Surma)
8. Do. (Brahmaputra)
9. Deltaic Bengal
10. Central do.
11. North do.
12. Orissa
13. Chota Nagpore
14. Behar (South)
15. Do. (North)
16. North Western Provinces (East)
17. Oudh (South)
18. Do. (North)
19. North Western Provinces (Central)
20. Do. do. (West)
21. Do. do. (Submontane)
22. Punjab (South)
23. Do. (Central)
24. Do. (Submontane)
25. Do. (Hill Districts)
26. Do. (North West)
27. Punjab (West)
28. Malabar
29. Madras (South Central)
30. Coorg
31. Mysore
32. Konkan
33. Bombay Deccan
34. Hyderabad (North)
35. Khandeish
36. Berar
37. Central Provinces (West)
38. Do. (Central)
39. Do. (East)
40. Guzerat
41. Kattiawar
42. Sind
43. Central India (East)
44. Rajputana (East) Central India (West)
45. Rajputana (West))
46. East Coast (North)
46(a.) Do. do. (a)
47. Hyderabad (South)
48. Madras (Central)
49. East Coast (Central)
50. East Coast (South)
51. Madras (South)

GOVERNMENT OF INDIA.

METEOROLOGICAL DEPARTMENT.

MONTHLY WEATHER REVIEW,

PUBLISHED BY ORDER OF

THE GOVERNMENT OF INDIA.

CALCUTTA, FEBRUARY, 1891.

INTRODUCTION.

THIS review of the weather in India during the month of February 1891 is based on observations taken at 8 A.M. daily at 155 stations and on additional observations taken at 10 A.M. and 4 P.M. at 85 stations. The rainfall summary is based on the rainfall data of the meteorological observatories and of the rainfall telegrams received during the month from district officers throughout India. A summary of the snowfall reports received from district officers, giving information of the weather and snowfall in the mountain districts to the north and north-west of India, is also given.

Summary of the chief features of the weather in India during the month of February 1891.

In the Weather Review of the month of January it was pointed out that the weather during that month and the preceding three months had been unusually disturbed in Upper India and the adjacent mountain districts. Much larger quantities of snow had fallen than usual, and the accumulation of snow in the Himalayan Mountain area, together with the prolonged unsettled weather, had largely modified the temperature and pressure conditions of Northern India. Temperature was considerably below the normal in Northern India, the deficiency being greatest on the North-West Frontier and diminishing in amount eastwards and southwards. Temperature was slightly above the normal in the Peninsula and Burma. Pressure was in excess in North-Western and Central India, and was in defect in Southern India, the Deccan, Burma, and Assam. The deficiency in Assam and Burma was almost as largely marked as the excess in the Punjab and Sind. The meteorological conditions of North-Western and North-Eastern India (including Burma) thus stood in the most marked contrast to each other. The chief features of the weather in February were, it will be seen, almost identical in general character with those of January, but were even more prominent and largely marked.

The meteorology of the month of February was marked by several very unusual features. The most important were heavy rainfall in the Punjab and excessive snowfall in the Western Himalayan and Afghan mountain regions, the prevalence of abnormally low temperatures over the whole of Northern India during the greater part of the month, and the occurrence of numerous thunderstorms and abnormally heavy rain in certain areas which usually receive very little rain in February. These were Southern India, Berar, the Central Provinces, and Central and South Bengal. In all these districts the total rainfall of the month, although not very large in amount, was very considerably in excess

of the normal rainfall of the period. On the 1st a shallow depression appeared in Sind and advanced eastwards during the next four days across Northern India into North Bengal and Assam, where it filled up. A secondary depression formed rapidly in the Punjab on the 2nd and filled up equally rapidly on the 3rd. This disturbance gave moderate to heavy rain to the Punjab and western districts of the North-Western Provinces, and much snow in the mountain districts. A warm wave preceded the primary depression in its advance across Northern India. In the rear of the primary depression temperature fell very rapidly, and a broad cool wave advanced across Northern India from the 1st to the 8th, which reduced temperature very largely below the normal. Thus at Quetta the mean temperature on the 31st of January was 8° above the normal, and on the 1st of February 19° below it. This cool wave extended over the whole of Northern India on the 6th, on which day the depression of the temperature was most marked in East Behar, where the mean temperature was 12° below the normal. Pressure increased almost continuously from the 4th or 5th in Northern India until the 11th. A rapid increase, exceeding a tenth of an inch, occurred in Upper India on the 8th, and a second equally rapid increase on the 10th. These were on both occasions accompanied by a strengthening of the north-west winds in Upper India for a brief period, and probably by an influx of cool air from Afghanistan which reduced temperature considerably. As this effect was transmitted south-eastwards it may be stated that the first cool wave of the month was followed on the 8th, 9th, and 10th by a second cool wave, and that this again was followed on the 11th and succeeding days by a third cool wave. This succession of cool waves across Northern India reduced temperature very largely below the normal, and the first fortnight of February hence formed an abnormally cool period over the whole of Northern and Central India. On the 12th, for example, the mean temperature of the day was from 10° to 12° below the normal over the greater part of Sind, Rajputana, the Punjab, and Central India.

During the whole of the period from the 11th to 17th the weather was unusually fine and clear in Northern India, with stronger winds than usual. Weather became, however, somewhat unsettled in two areas in the Peninsula. These were the southern districts of Madras (including Madura, Coimbatore, and Trichinopoly), and the Central Provinces and Berar. Numerous thunderstorms occurred from day to day, which in some cases gave very heavy rain. Thus, Trichinopoly on the 17th registered 5·27 inches during a severe thunderstorm. Tinnevelly and other districts in South Madras, which had suffered severely from drought during the previous three months, received moderate rain.

The weather cleared rapidly in these areas on the 16th, whilst at the same time pressure began to give way steadily in Upper India. This preceded the appearance of the second cold-weather storm of the month. It apparently formed in the Central Punjab on the 20th and filled up on the 22nd.

The third cool wave crossed the North-West Frontier on the 11th, and advanced eastwards across the head of the Peninsula and passed into Bengal and Assam on the 17th. Temperature increased rapidly in Rajputana, Central India, and the Central Provinces on the 16th and 17th, and on the 19th and 20th was from 4° to 7° above the normal in that area, and was also more or less above it over the greater part of the remainder of India.

It has been stated above that a depression formed in the Central Punjab on the 20th. It was almost stationary, drifting very slowly eastwards on the 21st, and filled up near the hills on the 22nd. Light to moderate rain or snow fell in the North and East Punjab and adjacent hill districts. Whilst it was filling up pressure was falling in Bengal and Behar, and a very extensive but shallow depression extended from Bengal over the Gangetic Plain. This determined a drift of moist easterly winds from the head of the Bay over the Gangetic Plain as far west as Agra and Bareilly. General rain fell over the whole of Bengal, Behar, Chutia Nagpur, and the greater part of the North-Western Provinces. The rainfall was very unusual and abnormally heavy for the season. Behar, on the whole, received the largest amount, an average of upwards of 1½ inches falling in that province during this disturbed period. The depression filled up on the 24th, and fine clear weather set in over the Gangetic Plain, although weather continued unusually cloudy and slightly disturbed in the Punjab.

The rainfall of the 22nd and 23rd in Northern India (chiefly Behar and Bengal) caused a large reduction of temperature. A cool wave advanced from the North-West Frontier across Northern India on the 23rd 24th, and following days, and the rainfall in Bengal on the 22nd and 23rd caused a large local diminution of temperature in North-Eastern India. The cool wave passed through Behar and Chutia Nagpur on the 26th and Bengal on the 27th. A warm wave followed this cool wave and affected Rajputana, Central India, and the Central Provinces on the 26th and 27th. This was followed by a very cool wave which appeared on the North-West Frontier on the 25th. Hence, at the end of the month, the temperature conditions were somewhat complicated, North-East India being under the influence of a cool wave, Central India of a warm wave, and North-West India of a very cool wave.

The following data for three stations in the centre of each of these areas illustrate the conditions clearly :—

Character of wave.	Area.	Representative stations.	Variation of mean temperature of 24 hours preceding 8 A. M. of 28th from normal.
Cool wave	North-Eastern India	Toungoo	−5·1
		Thayetmyo	−4·4
		Jessore	−3·4
Warm wave	Central India and Rajputana.	Ajmere	+7·7
		Deesa	+5·1
		Jhansi	+4·7
Cool wave	North-Western India	Dera Ismail Khan	−12·6
		Mooltan	−8·9
		Jacobabad	−8·3

The mean maximum or day temperature of the month was below the normal over Northern India and was in slight excess in the Peninsula and Burma. The deficiency, which was nearly 8° in amount in the North-Western Punjab, diminished in amount eastwards and southwards. The variations of the minimum temperature were similar in character but smaller in amount than those of the maximum. Hence the mean temperature of the month was below the normal in Northern India, the deficiency being greatest in the North and West Punjab, where it was 4°. It was, on the other hand, in slight to moderate excess in the Peninsula and Burma. The following gives a *résumé* of the temperature data of the month for the larger meteorological divisions :—

METEOROLOGICAL DISTRICT.	VARIATION OF			
	Mean maximum from normal.	Mean minimum from normal.	Mean daily from normal.	Mean daily range from normal.
Burma Coast	+1·1	+1·2	+1·1	−0·1
Assam	+0·7	−0·3	+0·2	+1·0
Bengal and Orissa	−1·6	+0·1	−0·8	−1·7
Gangetic Plain	−2·8	−1·1	−2·0	−1·7
Upper Sub-Himalayas	−5·4	−1·6	−3·5	−3·8
Indus Valley	−5·4	−1·1	−3·3	−4·3
East Rajputana and Central India	−1·8	−1·2	−1·5	−0·6
Deccan	−2·2	−1·0	−1·6	−1·2
West Coast	+1·4	+0·5	+1·0	+0·9
Southern India	−0·3	+2·0	+0·8	−2·3

The air movement during the month was on the whole steadier and stronger in Northern and Central India, and more especially at the hill stations. North-westerly winds were unusually prevalent in South Bengal during the month and continued steadily until the end of the month. In the Peninsula and Burma winds were approximately normal The north-east monsoon winds in the Bay, as indicated by the Port Blair observations, were stronger but less steady than usual.

The air contained on the average of the whole month less aqueous vapour than usual over the whole of India, with the exception of portions of the Deccan, more especially those represented by the stations of Sholapur, Bellary, and Salem, where the air was also much damper. There was more cloud than usual except in Sind, Rajputana, the greater part of the North-Western Provinces. and the Bombay coast districts. The excess was large in Madras and the Punjab. The rainfall of the month occurred during the periods of disturbance described in the preceding paragraphs and was very irregularly distributed. Lower Sind, Rajputana, Central India, Guzerat, Kathiawar, the Konkan, Burma (except the coast districts), the North-West Provinces, and Hyderabad practically received no rain during the month. The Punjab, Upper Sind, Bengal, and North Behar, Assam, Berars, and the Central Provinces and Southern India received general rain more or less in excess of the normal. The following table gives data showing the distribution of the rainfall of the month :—

METEOROLOGICAL PROVINCE.	RAINFALL.		
	Rainfall of month.	Normal rainfall of month.	Variation from normal.
Burma Coast	0·38	0·12	+0·26
Burma Inland	0·11	0·04	+0·07
Assam	1·66	1·49	+0·17
Bengal and Orissa	1·64	0·84	+0·80
Gangetic Plain and Chutia Nagpur	0·37	0·40	−0·03
Upper Sub-Himalayas	1·22	1·19	+0·03
Indus Valley and N.-W. Rajputana	0·39	0·29	+0·10
East Rajputana, Central India, and Guzerat.	0·03	0·20	−0·17
Deccan	0·55	0·23	+0·32
West Coast	0·34	0·19	+0·15
Southern India	0·97	0·25	+0·72

Atmospheric Pressure.

The distribution of mean 8 A.M. pressure for February is shown by means of three charts. The first chart (Plate I) gives the distribution of the mean pressure of the month reduced to sea level, and to constant gravity (that of Latitude 45°), by means of isobars drawn for differences of pressure of ·05″, or $\frac{1}{20}$th of an inch. The second chart (Plate II) gives the variations of the actual mean pressure from the normal pressure. These values are obtained from the barometric readings reduced for temperature only. A small chart, No. 4 of Plate III, gives the distribution of the monthly mean daily pressure, and of the mean winds, in the same form and manner as in the monthly charts given hitherto in the Annual Reports on the Meteorology of India. The data on which this chart is based are given in Table II. The more important barometric changes and movements during the month are fully given in the following statement of the barometric depressions of the month. The data that are used in this discussion are the 8 A.M. reduced observations and the variations derived from a comparison of these observations and the normal values

given in Table I. The means in the third column of that Table are not only reduced or corrected to sea level, but also to constant gravity. The normal means are obtained from the observations of the period 1878—88, and in order that the means and variations may be strictly comparable the means have been calculated from observations of the same period in all cases.

The mean pressure of the whole of India was ·022″ above the normal mean. Relatively to the general abnormal condition pressure was in slight excess over the whole of Northern and Central India. The excess was greatest in the Indus Valley, where it ranged from ·010″ at Kurrachee to ·016″ at Peshawar and ·017″ at Mooltan. Pressure was, on the other hand, relatively in defect in the Peninsula to the south of Lat. 18° N. and in Assam and Burma. The deficiency slightly exceeded ·02″ in South Burma and Southern India. The following gives the largest negative barometric abnormals:—

District.	Station.	Barometric anomaly.
Burma	Diamond Island	—·027
Southern India	Madras	—·034
	Bangalore	—·030
	Trichinopoly	—·029
	Karwar	—·028

The general character of the distribution of the mean pressure of the month did not differ much from the normal. The most important feature was the slightly increased mean gradients due to increased pressure in Northern India and decreased pressure in Southern India, which undoubtedly tended to give a larger influx of cool air from Central Asia across the North West Frontier, and increased strength to the North-East monsoon winds in the Arabian Sea and Bay of Bengal during the month.

Barometric depressions and cold-weather cyclonic storms of the month.

Cyclonic storm of February 1st to 5th.—At the end of the month of January the barometric movements were small and such as obtain in fine, settled weather. The observations of the 31st of January showed that pressure was decreasing briskly on the North-West Frontier. The following gives a summary of the pressure and cloud data of the 31st:—

District.	Barometer. Change in preceding 24 hours.	Barometer. Variation from normal of day.	Average amount of cloud at 8 A.M.
Punjab	—·031	+·015	3·6
Sind	—·052	—·024	0
Rajputana	—·008	+·017	0
North-West Provinces	+·001	—·027	0·4
Guzerat and Central India	—·001	+·001	0·3
Central Provinces and Berars	+·021	+·018	0
Bengal	+·001	—·061	1·0
Bombay	+·025	+·010	0
Madras	+·021	—·016	1·7
Burma	—·028	—·112	1·4

The barometric changes given above and at Quetta indicate that a very slight disturbance was affecting Sind and Beluchistan. Skies were partially clouded in Beluchistan and clear in Sind, but were rapidly clouding over in the Punjab.

The barometer fell over the whole of India during the next 24 hours, the fall being largest in Sind and Beluchistan and diminishing in amount eastwards and southwards. At the same time a large increase of cloud occurred in the Punjab, Sind, and the North-West Provinces. The following table gives a summary of the more important pressure data for the 1st February:—

District.	Barometer. Change in preceding 24 hours.	Barometer. Variation from normal of day.	Average amount of cloud at 8 A.M.
Punjab	—·164	—·151	9·6
Sind	—·165	—·199	7·0
Rajputana	—·144	—·122	0·3
North-West Provinces	—·079	—·110	2·8
Guzerat and Central India	—·110	—·104	0·6
Central Provinces and Berar	—·077	—·059	0
Bengal	—·053	—·120	0·4
Bombay	—·061	—·051	0
Madras	—·053	—·076	2·0
Burma	—·017	—·130	1·9

The chart for the day shows that a moderate depression overlay Upper Sind, the centre of which was probably near and to the south-west of Jacobabad. The following gives data of the stations in and near the area of depression:—

Station.	Barometer. Actual corrected to sea level and constant gravity.	Barometer. Change in preceding 24 hours.	Barometer. Variation from normal of day.	Amount of cloud.	Wind. Direction.	Wind. Average velocity during previous 24 hours in miles per hour.
Jacobabad	29·791	—·241	—·274	3	E.S.E.	2
Mooltan	·864	—·217	—·204	10	N.E.	1
Hyderabad	·837	—·193	—·224	10	N.E.	4
Kurrachee	·851	—·162	—·198	8	E.S.E.	5
Peshawar	·873	—·253	—·199	10	W.	4
Quetta	24·395	—·239	—·248	3	S.S.W.	2
Murree	23·695	—·154	—·115	10	E.S.E.	13

The wind directions of these stations are extremely irregular, and show that at this stage there was no cyclonic circulation in Sind or Beluchistan. Winds were very feeble and skies very lightly clouded at Quetta and Jacobabad. The chief development of cloud was in fact in the Punjab and Western Himalayas, and the large increase of the strength of the wind at Murree clearly indicated that the only area in which the cyclonic action was increasing was the North Punjab. Hence, the observations of the 31st and 1st establish that a moderate disturbance appeared in Sind and Beluchistan, and was marching eastwards, and that a secondary disturbance was developing in the North Punjab. An examination of the Bushire, Baghdad and Meshed observations shows clearly that the disturbance did not enter Beluchistan from Persia. It hence almost certainly originated in Beluchistan and Sind.

The observations of the next 24 hours indicate that the secondary disturbance in the North Punjab developed with great rapidity, and at 8 A.M of the 2nd a deep depression overlay the Punjab, which obscured the shallower depression advancing eastward across Northern India from Sind.

The following gives mean data of the pressure changes and cloud amounts of the 2nd:—

District.	Barometer.		
	Change in preceding 24 hours.	Variation from normal of day.	Average amount of cloud.
Punjab	—·323	—·460	9·0
Sind	—·012	—·217	0
Rajputana	—·190	—·288	4·0
North-West Provinces	—·107	—·201	4·2
Guzerat and Central India	—·062	—·174	1·1
Central Provinces and Berars	—·061	—·112	0
Bengal	+·028	—·092	0·5
Bombay	—·014	—·065	0·5
Madras	—·001	—·077	1·6
Burma	+·041	—·089	1·1

These pressure changes in Northern and Central India are at once explicable on the supposition of the advance of the primary disturbance into Eastern Rajputana and the development of a deep secondary disturbance in the North Punjab. The following gives data for stations in the central area of the secondary disturbance in the Punjab:—

	Station.	Barometer.			Amount of cloud.	Wind.	
		Actual corrected to sea level and constant gravity.	Change in preceding 24 hours.	Variation from normal of day.		Direction.	Average velocity during previous 24 hours in miles per hour.
Plain stations.	Peshawar	29.546	—·327	—·533	0	S. S. E.	3
	D. I. Khan	·525	—·375	—·545	8	S.	2
	Khushab	·543	—·353	?	8	S. S. W.	4
	Lahore	·530	—·341	—·512	10	S. E.	6
	Sialkot	·502	—·408	—·506	6	E.	6
	Rawalpindi	·454	—·446	—·518	10	S. W.	3
Hill station	Murree	...	—·385	—·499	10	S. E.	33

These observations show that a low pressure area, in which the barometer was upwards of five-tenths of an inch below the normal, lay over the north and centre of the Punjab, and that the depression was almost as large at Murree as at the level of the plains below. Also, the winds at the level of the plains, although somewhat irregular, were, on the whole, cyclonic in direction, but were comparatively feeble, whilst at the elevation of Murree they were the same in direction as at the level of the plains below, but were very violent and in fact stormy cyclonic winds. It is hence a striking example of the cyclonic storms of high elevation to which the cold-weather storms of Northern India chiefly, if not exclusively, belong. Heavy rain had fallen over the greater part of the Punjab and heavy rain or snow in the Punjab Hills, thus showing that ascensional movement had been very active over that region during the previous 24 hours.

The presence of the primary depression in East Rajputana is very feebly indicated by the peculiar southern bend of the isobars in that area shown in the weather chart of the day. The following gives data of the stations in the area:—

Station.	Barometer.				Wind.	
	Actual corrected to sea level and constant gravity.	Change in preceding 24 hours.	Variation from normal of day.	Amount of cloud.	Direction.	Average velocity during previous 24 hours in miles per hour.
Ajmere	29·754	—·200	—·291	6	W.	11
Jeypore	·761	—·177	—·275	0	S. E.	2
Jhansi	·802	—.133	—·218	0	S. W.	4
Agra	·799	—·176	—·255	4	S. W.	6

The gradients in North-West India at 8 A.M. of this day were very steep, and such as usually accompany very strong winds. In the primary depression the winds were very light and irregular in direction. Skies were either clear or very lightly clouded, doubtless partly, if not mainly, due to the indraught to the deep secondary depression. The barometric movements of the next 24 hours were also very large in amount. A very rapid rise occurred in North-Western India due to the filling up of the secondary depression in the Punjab. The primary depression hence again came into prominence and was now in Behar and the south-eastern districts of the North-West Provinces, having drifted about 400 miles during the previous 24 hours. The following table gives data showing the general char-

acter of the pressure changes in India of the previous 24 hours:—

District.	Barometer. Change in preceding 24 hours.	Barometer. Variation from normal of day.	Average amount of cloud.
Punjab	+·363	—·125	4·2
Sind	+·153	—·067	0
Rajputana	+·218	—·112	0
North-West Provinces	+·059	—·154	1·4
Guzerat and Central India	+·098	—·091	0·3
Central Provinces and Berars	+·017	—·101	0
Bengal	—·034	—·130	0·9
Bombay	+·024	—·040	0·1
Madras	+·003	—·074	1·1
Burma	—·014	—·100	2·1

The chief change was hence the very rapid rise in Upper India, and, as shown by the chart of the day, the filling up of the depression with, as might be expected, a large decrease in the amount of cloud. Light north-westerly winds and calms now prevailed in the Punjab. The position of the only depression now in existence is defined by the following observations:—

Station.	Barometer. Actual corrected to sea level and constant gravity.	Barometer. Change in preceding 24 hours.	Barometer. Variation from normal of day.	Amount of cloud.	Wind. Direction.	Wind. Average velocity during previous 24 hours in miles per hour.
Hazaribagh	29·874	—·039	—·122	0	S.	7
Patna	·862	—·045	—·159	2	E.	4
Benares	·834	—·046	—·188	7	E. N. E	4
Allahabad	·848	—·009	—·183	0	W.N.W	4
Sutna	·886	+·020	—·147	0	W.	5

This shallow depression in the south-eastern districts of the North-Western Provinces and the adjacent districts of Behar was evidently the continuation of the disturbance which had crossed Rajputana, as it resembled it in all its important features, whilst it differed entirely in character from the depression in the Punjab on the 2nd. It was in fact a very shallow dry or rainless depression, accompanied with light to moderate winds and a very slight development of cloud.

Light to moderate showers had fallen in the Punjab and north-western districts of the North-Western Provinces, and heavy snow in the Western Himalayas. Elsewhere none had fallen, and hence the rainfall of the previous 24 hours was primarily due to, and accompanied the disturbance in the Punjab.

Pressure continued to increase in North-Western India during the next 24 hours, and the shallow depression moved eastwards at approximately the same rate as hitherto, and was in North and Central Bengal at 8 A.M. of the 4th. The following table gives data showing the pressure changes of the previous 24 hours:—

District.	Barometer. Change in preceding 24 hours.	Barometer. Variation from normal of day.	Average amount of cloud.
Punjab	+·102	—·034	3·0
Sind	+·037	—·029	0
Rajputana	+·093	—·046	0·7
North-West Provinces	+·082	—·085	0·5
Guzerat and Central India	+·041	—·057	0·1
Central Provinces and Berars	+·030	—·090	0
Bengal	—·062	—·184	1·6
Bombay	—·020	—·074	0
Madras	—·046	—·122	1·7
Burma	—·038	—·146	1·2

Pressure was now normal or slightly in defect in North-Western and Central India. The brisk fall in Bengal was due to the transfer of the shallow depression to that area. Its position is given by the following observations:—

Station.	Barometer. Actual corrected to sea level and constant gravity.	Barometer. Change in preceding 24 hours.	Barometer. Variation from normal of day.	Amount of cloud.	Wind. Direction.	Wind. Average velocity during previous 24 hours in miles per hour.
Purneah	29·778	—·091	—·227	0	S. W.	2
Dinagepur	·755	—1·40	?	0	S. W.	2
Jalpaiguri	·739	—·156	?	0	...	2
Dhubri	·754	—·138	—·244	0	S. W.	6
Sibsagar	·798	—·087	—·246	10	S. W.	2
Darjeeling	?	—·096	?	0	S. W.	9

These observations show that the depression was fairly well marked and that it had advanced about 400 miles during the previous 24 hours. They also indicate that the depression now probably lay over the Bhutan and Sikkim hills, as the winds at Darjeeling, at a height of nearly 8,000 feet, were the same in direction as at the nearest stations in the plains of Bengal, but were considerably stronger. No rain had fallen during the previous 24 hours, and skies were clear over the area of depression. The depression filled up quickly during the next 24 hours, and the Sibsagar observations alone show a trace of its existence at 8 A.M. of the 5th. It may hence be assumed to have disappeared in East Assam and Upper Burma on the morning of the 5th.

The following gives roughly the position of the central depression of the primary disturbance from day to day during its existence:—

Date.	Area of central depression.	Position. Lat. N.	Position. Long. E.
February 1st	Sind	27°	68°
,, 2nd	Rajputana	26°	76°
,, 3rd	Behar	25½	82°
,, 4th	Bengal	26½	88°
,, 5th	East Assam	27°	94°

These positions are of course only approximate, but they show that the disturbance moved on an easterly course across Northern India, from Sind to Assam, with a fairly uniform velocity, averaging about 400 miles daily.

The following are the more important features of the depression :—

(*a*) It was throughout a shallow depression, but advanced across the whole breadth of Northern India at a fairly uniform rate of about 18 miles an hour.

(*b*) It was during the greater part of its existence a dry depression, and not only gave no rain but the greater part of the depression area was free from cloud.

(*c*) The phenomena of the storm are easily explicable on the supposition that it was a whirl in the steady westerly current of the higher atmospheric strata, which is one of the most important features of the cold-weather circulation of Northern India.

(*d*) When entering Sind from Beluchistan it gave rise, probably by drawing upon the upper humid current from the equatorial regions of the Arabian Sea, to cloud and rainfall and much ascensional movement in the north-eastern quadrant by the local action of the Himalayan Mountains. This led to the rapid formation of a deep depression in the Punjab, which, however, filled up as rapidly as it formed, and only influenced the primary depression by clearing the skies and depriving it of much of its aqueous vapour.

(*e*) The primary depression was unchanged in character until it got entangled amongst the high mountain ranges to the north of Sikkim and Bhutan, when it was speedily broken up.

From the 6th to the 11th pressure continued to increase in North-Western India. The most rapid rise occurred on the 10th, on which day pressure increased nearly two tenths of an inch in the Punjab and was abnormally high on the morning of the 11th. The following gives 8 A.M. pressure data of that day for the two stations at which pressure was most excessive :—

Station.	Barometer.		
	Actual corrected to sea level and constant gravity.	Change in preceding 24 hours.	Variation from normal of day.
Peshawar	30·459	+·181	+·344
Dera Ismail Khan	30·455	+·203	+·374

The only occasion on which a higher pressure has been recorded in the Punjab during the past 13 years was on January 5th, 1886, at 10 A.M., when a pressure of 30·493″ was recorded at Dera Ismail Khan. On the same day and hour a pressure of 30·453″ was registered at Mooltan and 30·445″ at Lahore. This excessive pressure in Upper India on the 10th and 11th of the month appeared to strengthen the north-east winds in the Bay of Bengal, and to produce an unusual influx of damp easterly winds into the Peninsula (chiefly the most southern districts), which gave slightly unsettled weather, with frequent thunderstorms and rain. During the period of excessive pressure from the 10th to the 18th, both the Central Provinces and the Peninsula south of Lat. 15°N. received almost daily rain, chiefly as local thunder showers. On the 18th the barometer, which was at 8 A.M. of that day above the normal by amounts varying from two tenths in the Punjab to a twentieth of an inch in Southern India, began to fall rapidly in Northern India and briskly in the Peninsula, and fine, settled weather set in again over the Peninsula, whilst a disturbance commenced in North-Western India.

The following gives barometric data of the 19th :—

District.	Barometer.		Average amount of cloud at	
	Change in preceding 24 hours.	Variation from normal.	8 A.M., 18th.	8 A.M., 19th.
Punjab	—·192	—·057	8·6	7·6
Sind	—·162	—·007	1·7	10·0
Rajputana	—·161	—·028	3·0	4·0
North-West Provinces	—·182	—·045	1·3	1·5
Guzerat and Central India	—·118	—·006	0·7	2·0
Central Provinces and Berars	—·125	—·013	1·3	0·4
Bengal	—·149	—·033	1·3	1·7
Bombay	—·079	+·007	0	0·7
Madras	—·089	+·014	2·8	1·4
Burma	—·085	—·012	0·7	1·4

This large fall of the barometer over the whole of India immediately preceded the formation of a depression in the Punjab. On the 17th and 18th pressure was highest and also most excessive in Upper Sind. On the 18th, as stated above, pressure decreased very rapidly over the whole of India, due apparently in part to a general expansional movement. The changes were largest in the area extending along the foot of the hills from Ludhiana to Meerut and the adjacent hill districts. The following gives data for 8 A.M. of the 19th in illustration :—

—	Station.	Barometer.		Amount of cloud.	Wind.	
		Change in preceding 24 hours.	Variation from normal of day.		Direction.	Average velocity during previous 24 hours in miles per hour.
Plains stations	Ludhiana	—·211	—·099	8	W.	4
	Dehra Dun	—·239	?	7	Calm	1
	Meerut	—·220	—·075	3	W.	4

—	Station.	Barometer. Change in preceding 24 hours.	Barometer. Variation from normal of day.	Amount of cloud.	Wind. Direction.	Wind. Average velocity during previous 24 hours in miles per hour.
Hills stations	Quetta	—·097	+·028	7	Calm	0
	Murree	—·114	+·014	8	E. N. E.	9
	Simla	—·186	—·092	10	N. W.	...
	Mussoorie	—·186	?	7	N. N. W.	...
	Ranikhet	—·156	—·034	0	Calm	5
	Darjeeling	—·116	?	10	Calm	3

Hence the barometric observations show that there was a tendency to slight disturbance in the South-East and Central Punjab.

Depression and cold-weather storm of 20th and 22nd February.—The barometer fell over the whole of India during the next 24 hours, but the fall was not large, except in North-Western India, where it accompanied the formation of a deepish depression in the Punjab. The following gives data illustrating the barometric movements throughout India during the 24 hours preceding 8 A.M. of the 20th:—

District.	Barometer. Change in preceding 24 hours.	Barometer. Variation from normal.	Average amount of cloud.
Punjab	—·235	—·270	7·7
Sind	—·234	—·246	8·7
Rajputana	—·224	—·226	9·3
North-West Provinces	— 073	—·123	5·8
Guzerat and Central India	—·113	—·130	7·6
Central Provinces and Berars	—·079	—·097	5·4
Bengal	—·023	—·057	4·0
Bombay	—·057	—·050	2·6
Madras	—·064	—·050	1·5
Burma	+·002	0	2·7

The position of the depression is shown by the following observations:—

Station.	Barometer. Actual corrected to sea level and constant gravity.	Barometer. Change in preceding 24 hours.	Barometer. Variation from normal.	Amount of cloud.	Wind. Direction.	Wind. Average velocity during previous 24 hours in miles per hour.
Khushab	29·689*	—·292	?	6	E.	3
Montgomery	·678	—·316	?	6	E.	6
Mooltan	·705	—·297	—·338	5	N. E.	1
Jeypore	·828	—·180	—·213	10	W.N.W	3
Sirsa	·719	—·251	—·293	8	S.E.	6
Lahore	·737	—·227	—·281	10	S.E.	2

* This observation was wrongly given as 29·639 in the India Weather Report of the day.

The winds showed a fairly complete cyclonic circulation, but it was as yet moderate in amount. The observations indicate that the centre of the barometric depression and cyclonic circulation was to the south of Montgomery. No rain had fallen except in the Kashmir hills, and at Murree, Quetta, and Rawalpindi, and the amounts at these stations were not large. The concentration up to this stage had hence not accompanied heavy rain.

The barometer increased slightly during the next 24 hours over the greater part of India, but the changes were of little importance, except in Upper India, where they were due to the transfer of the depression into the South-East Punjab. The following observations define its position at 8 A M of the 21st:—

Station.	Barometer. Actual corrected to sea level and constant gravity.	Barometer. Change in preceding 24 hours.	Barometer. Variation from normal of day.	Amount of cloud.	Wind. Direction.	Wind. Average velocity during previous 24 hours in miles per hour.
Sirsa	29·693	—·026	—·333	0	W.	7
Ludhiana	·703	—·054	—·312	6	S. E.	8
Lahore	·734	—·003	—·299	2	N. E.	5
Montgomery	·745	+·067	?	4	N.	6

Snow had fallen generally in the hill districts and sporadic showers in the Punjab plains, but no general rain had occurred in the central area of depression. For example, the preceding 48 hours had been rainless at Montgomery, Khushab, Lahore, and Sirsa. Rain, it may be noted, fell chiefly in the districts at the foot of the hills, and hence at a very considerable distance to the north of the central depression. Skies had cleared to the west of the depression, and were very lightly clouded in the central depression itself. If the centre was near and to the south of Montgomery on the 20th and north of Sirsa on the 21st, as the observations indicate, it had advanced not more than 100 miles in an east-south-east or east by south track during the 24 hours from 8 A.M. of the 20th to the same hour of the 21st.

The barometer rose during the day over the whole of India except in Bengal and Orissa. The rise was greatest along the foot of the hills from Peshawar to Roorkee. The depression of the 21st broke up on approaching the hills of the South-East Punjab. The fall in Bengal was apparently caused by an influx of moist winds from the head of the Bay. The effect of the changes was to give a trough, or belt, of low pressure, extending in a curve from Lower Sind to the north-western districts of the North-Western Provinces and thence to the Orissa Coast. General rain had fallen during the previous 24 hours over the greater part of Bengal, and skies were heavily clouded over the Gangetic Plain from the Bengal Coast to the centre of the North-

West Provinces, but were clear or lightly clouded elsewhere. A further increase of pressure occurred during the day over the whole of India, which was large in Upper India and small in Bengal and the Peninsula. Well-marked anti-cyclonic conditions were hence established on the morning of the 23rd in Upper India, but a shallow depression covered South-West Bengal and Orissa.

The distribution of pressure was very unusual for the season, and the weather was generally disturbed in North-Eastern India; and numerous thunderstorms, in some cases attended with severe hail, had visited Bengal, Behar, and the eastern districts of the North-West Provinces, in which fairly general rain was received. The barometer again rose during the day and further emphasized the existing anti-cyclonic or high pressure conditions in Upper India. The depression was much less marked in South Bengal and Orissa on the morning of the 24th, and the weather improved rapidly during the day. Some showers were received in Orissa.

Pressure began to give way rapidly on the North-West Frontier on the 25th, which initiated a very slight disturbance in the Punjab on the 26th. It gave fairly general rain on that day to the greater part of that province. Pressure increased slightly on the 26th in North-Western India. No large or important change occurred during the remainder of the month, but weather conditions continued in a slightly unsettled condition, with local showers.

The disturbance of the 20th and 21st was noteworthy in several respects, more especially the following:—

(1) It apparently originated in the Punjab. The Indian or Beluchistan observations of the 18th to the 20th furnish no evidence of the passage of a deep depression from Afghanistan into the Central Punjab. On the other hand, the Bushire observations show that a depression passed across Southern and Central Persia between the 15th and 18th. The following gives the Bushire observations:—

Date.	Barometer.		Wind.	
	Actual corrected to sea level and constant gravity.	Change in preceding 24 hours.	Direction.	Average velocity during previous 24 hours in miles per hour.
15th	30·048	+·002	N. E.	3
16th	29·838	—·210	S. E.	4
17th	·820	—·018	S.	3
18th	·721	—·099	S. E.	6
19th	·992	+·271	N. W.	20

(2) Bushire is about 1,200 miles west of Lahore. It is very improbable that the depression which passed eastwards to the north of Bushire on the 17th and 18th should be the same as that which appeared in the Central Punjab on the morning of the 20th. It is, on the other hand, possible that a general feeble disturbance and very shallow depression may have been rapidly transmitted eastwards across East Persia, Afghanistan, and Beluchistan from the 16th to the 19th and that local conditions in the Punjab caused a large development of the disturbance when it reached that area for a period of about 48 hours, after which it rapidly broke up on reaching the high-ground of the Himalayas. The supposition cannot, however, be verified in the almost entire absence of observations in the area to the north-west of India.

(3) The rapid development of the depression on the 19th and its equally rapid disintegration on the 21st.

(4) The absence of rainfall in the central depression and in the area to the south of it, and the occurrence of moderate to heavy snow or rain in hills and the sub-montane districts to the north of the central depression, in which respects it resembled the larger storms which drift across Northern India from Sind to Bengal.

(5) These features of the storm suggest that the geographical features of the Punjab are largely influential in contributing to the rapid development of cold-weather storms in Upper India.

The preceding discussion has illustrated the very varying characteristics of the cold-weather storms in Upper India. It also confirms the conclusions drawn in the January review from the storms of that month. The following gives a brief summary of these conclusions:—

1st.—The majority of these cold-weather storms enter North-Western India from Beluchistan as shallow depressions and advance across Northern India in an easterly direction.

2nd.—These storms are essentially disturbances in an upper current, *viz.* the westerly current, which blows across Northern India and the tropical belt generally of the old world.

3rd.—There is a well-marked tendency for these depressions to develop slightly when passing through Central India.

4th.—The distribution of cloud and the occurrence of rain in connection with these storms are peculiar, and apparently dependent upon the obstruction offered by the partial barrier of the Himalayas. The precipitation occurs chiefly on the southern face of the Himalayas and in the plain districts of the Punjab, the North-Western Provinces, and Behar, and hence at a considerable distance to the north and north-east of the central

depression, as defined either by the isobars or the isobaric abnormals.

5th.—Occasionally, whilst these cold-weather shallow depressions are passing through Sind and Rajputana the barometer falls with great rapidity in the Punjab, and a deep secondary depression forms in the North Punjab. This usually moves slowly for a short period to the south-east or east-south-east, and after giving very heavy snow in the mountain districts and heavy rain in the North and East Punjab plains it fills up with equal rapidity. During the brief existence of the deep secondary depression the shallow primary depression is obscured, but immediately the former fills up the latter is again shown by the observations in a position to the eastwards such as it would have had if it moved with the ordinary velocity of these storms.

6th.—The last period of disturbance of the month shows that under somewhat exceptional circumstances a shallow depression may form in Northern India, which gives rise to an indraught of moist easterly winds in the lower atmosphere from the Bay of Bengal over the Gangetic plain. In this case general rain may occur over Bengal and the Gangetic plain, but its distribution is entirely different to that of the ordinary cold-weather storms, as it is heaviest on the whole in Bengal and diminishes westwards, and the precipitation is almost exclusively confined to the plain districts.

7th.—Finally, the barometric movement or oscillation during these cold-weather storms is frequently larger at Leh than in India itself. The following compares the total barometric movements at Leh and stations in Upper India during the second storm. The barometer at each of these stations fell steadily for three days and rose equally steadily for three days afterwards—

CHARACTER OF MOVEMENT.	Leh.	Murree.	Montgomery.	Lahore.	Roorkee.	Agra.
Total fall of the barometer from 19th to 21st .	—·533	—·339	—·521	—·440	—·364	—·392
Total rise of the barometer from 22nd to 25th .	+·404	+·310	+·441	+·395	+·331	+·315

These figures are based on observations taken at a definite hour daily, and are hence not strictly comparable. They do not necessarily give the total rise or fall as the lowest pressure during the storm probably occurred at different hours during the day at different stations. This accounts to some extent for the difference between the fall at different stations in the Punjab plains. The figures agree, however, in showing that the fall takes place more rapidly than the rise, and that the barometric movement during the storm is, in some storms at least, greater at Leh than in Northern India. The rise and fall of the barometer during the storm of the 19th to 22nd were also practically simultaneous over the whole of Upper India and Ladakh, and hence the storm was practically a stationary depression, although there was a slight eastward movement of the position of lowest pressure during the existence of the depression.

Summary of the Reports of the Weather and Snowfall in the mountain districts to the North and North-west of India.

The snowfall reports of the month of February show that the winter up to the end of that month was of exceptional severity in the Afghan mountains and the Western Himalayas. Unusually heavy snow fell in the latter area, and the snow accumulation of the winter of 1890-91 will probably be unusually large, and will hence largely modify the weather in Northern India during the hot-weather months, and also determine the distribution of rainfall during the south-west monsoon.

I.—The Afghan Highlands.

(a) Hills west of Kohat.

The Assistant Commissioner, Thull, supplied the following information on the beginning of March respecting the snowfall on the Sufed Koh and neighbouring hills:—

"There was an unusually heavy fall of snow on the 1st and 2nd February, some of which actually fell at *Thull* and *Ha. n8u*This fall was succeeded by rain, which quickly melted the snow in the plains and partly in the lower hills. The following is the approximate depth of the snowfall during the month on the chief passes:—

Name of Pass.	Approximate depth of snowfall.
Spinghar (Sufed Koh)	10 to 15 feet.
Dandoghar	2 „ 3 „
Zawa Mountain	3 „ 4 „
Samana	2 „ 3 „
Mastura	3 „ 4 „

"The depth of snow on the higher peaks of the Sufed Koh cannot at present be ascertained, but must have been considerable. The snow has now disappeared from the lower hills, but there is still some on the higher ranges. On the whole, the snowfall during the present season has been exceptionally heavy. In the corresponding month of last year no snow fell on the neighbouring mountain ranges."

(b) Hills near Peshawar.

The Political Officer, Khyber, states that "at the commencement of February nearly one foot of snow fell on the Khyber hills. On the Lakka and Torsapper the snowfall was heavier and averaged three feet and two feet respectively. In the Tirah hills it was said to be about three feet deep. Snow also fell in the Bazar Valley, in amounts which varied from one-half to one foot in depth."

The Tahsildar of Nowshera reported that four feet of snow fell at Cherat during the early part of the month, and upwards of 2½ feet on the neighbouring hills. It however melted rapidly, and on the 18th the snow was only from three to six inches in depth on the tops of these hills.

II.—The Himalayas.

The Kashmir and Punjab Himalayas.

(a). *Murree and adjacent hills.*—The following table gives the reported snowfall in this area:—

DISTRICT.	Date of fall.	Depth of snowfall. Ft.	In.
Murree	1st February	4	0
	2nd "	2	0
	20th "	2	0
	22nd "	2	6
	26th "	2	0
	TOTAL	12	6
Kahuta	February	2	6

The fall at Murree was five times as large as that of February 1889, and seven times as large as that of February 1890, and was larger than has ever been reported in February.

(b). *Kulu.*—The Extra Assistant Commissioner has furnished a very complete statement of the depth of snow on the various passes in the Kulu and Plach districts. The following table gives the whole of this information, together with similar information for the same month of 1889 and 1890:—

DISTRICT.	Name of Pass.	Height above sea level.	REPORTED DEPTH OF SNOW DURING FEBRUARY 1891.	1890.	1889.
			Feet.	Feet.	Feet.
Kulu	Rotang	13,000	19	15	18
	Hamtu	14,500	16	9	14
	Chanderkhani	...	15	12½	14
	Barsai	...	9	6	11
	Bujadhar	...	13	...	...
	Lori Achhri	...	10	4	10
	Pushtari	...	8	9	7
	Bubu	10,000	9	4	11
	Majang	...	6	4	5
Plach	Chul	...	13	5	22
	Srikand	15,000	35	...	55
	Maghian	...	11	5	16
	Tikkar	...	11	...	...
	Dindku	...	15	6	16
	Ramgarh	...	1	...	...
	Nanun	...	7	4	11
	Jalori	10,500	10	4	16
	Raghopur	...	11	6	16
	Himri	...	11	4½	13
	Sakiran	...	12	5	12
	Suphakun	...	17	8	12
	Gargarasan	17,000	21	8	18
	Bashleo	11,000	12	6	17
	Palach	...	14	8	10
	Tirath	...	14	8½	20

The depth of snow in February 1891 was hence much greater than in February 1890, but apparently not greater than in February 1889. Much greater care has, however, been exercised during the past two years to obtain accurate measurements, chiefly in consequence of the figures of cold weather of 1889 and of previous years having been either greatly exaggerated or very carelessly measured. It is hence almost certain that the snowfall of the month of February 1891 was much heavier than that of the corresponding month of many years past.

The Assistant Commissioner adds that "the weather was very cool and rather damp, and the sky more or less cloudy. Snow and rain fell every now and then during the month, and the passes are still closed."

(c). *Lahaul.*—The Reverend A. W. Heyde has sent the following very interesting account of the weather at Kailang in the Upper Chandra Bhaga Valley:—"The present winter set in unusually early, namely, at the end of November, and has so far (14th March) been a very severe one. What has characterized this winter chiefly were the strong and almost storm-like winds which always accompanied the heavier falls of snow. This was especially the case on the 25th of December, 16th and 17th January, 1st and 2nd February and the 26th and 27th February. Clear sunny days were rare indeed, the sky being nearly always completely overcast, and as a consequence the readings of the thermometers were, without much variation, continually low. The lowest reading of the dry minimum —3·6° we had on the 24th of February. In more genial winters the fallen snow used to melt away at least partially after each fall, but in this year it has remained on the ground nearly as it fell throughout the last three months, so that at present it lies still four feet deep before our house. There must therefore at present be great masses of snow on the passes and the still higher hills. It very seldom happens in Lahaul that people perish in the snow from cold or avalanches when going from one village to another during the winter, but this winter 13 persons lost their lives in this way, six of them were buried by an avalanche in January while going to a

neighbouring village, and four were frozen to death, having been overpowered by snow and storm not at all far from their village. Besides these ten, three found their death on the Rotang pass when foolishly trying to cross it in January.

The snowfall at Kailang fron 16th December to 14th March was equal to a fall of 12·38 inches of rain, and during this period there were 23 days on which snow fell. It may be added that from the latter date up to the 4th of April four feet more snow fell. The average fall is barely eight inches, so that the total precipitation of the period was upwards of 50 per cent. in excess.

Summary of Special Storm Reports.

The preceding discussion has shown that there were three periods of disturbed weather during the month. The first was from the 1st to the 6th, and was of the ordinary cold-weather type, giving stormy weather in the hill districts and gloomy weather, with showers in the plains. No severe local storms were reported during this period. The second period, extending from the 11th to the 18th, was one of irregular disturbance, giving rise to numerous thunder storms, in some cases attended with hail, in Berar, the Central Provinces and Southern India. The following are the more severe local storms reported to have occurred during this period:—

Hailstorms on the 11th, 12th and 13th at Chikalda in Berar, which did some damage to the crops. Severe thunderstorms at Akola, Jalgaon, Khamgaon and Akot in Berar on the 11th, 12th and 13th, which gave heavy rain. The heaviest fall was 1·42 inches on the 13th at Akot, 28 miles north of Akola. Hailstorms are also stated to have occurred at some of the neighbouring villages. Severe thunderstorm at Trichinopoly on the 16th, during which 5·27 inches of rain fell. Hailstorm at Nagpur on the 18th, during which hailstones about half an inch in diameter are stated to have fallen.

The third and last period of disturbed weather lasted from the 20th to the 23rd. Numerous thunderstorms occurred in Northern India during this period and were in some cases attended with destructive hail.

On the 20th severe thunderstorms are reported to have occurred at Roorkee, Lahore, and False Point; on the 21st thunderstorms at False Point, Pedong in Sikkim, and Hazaribagh (which was also visited by a hailstorm that did some damage to the crops); on the 22nd thunderstorms at Dehra Dun (at 2 P.M.), Cawnpore (at 1·48 P.M. to 3 P.M. from north-west), at Allahabad (from 5 P.M. to 7 P.M.), and at False Point and Comillah. The storm at Allahabad was an exceptionally severe one. It is stated that "the storm extended over a considerable distance to the south and south-east of Allahabad, and was accompanied with hail over a large area. In the Tahsils of Karchana, Barah and Meja the hailstones were very large and are said to have in many cases weighed from 8 to 16 ounces (?). The crops, which were then ripening, were totally destroyed in parts of these tahsils, and on the 24th thousands of the ryots flocked into Allahabad and appealed to the Collector for exemption from the land-tax on the plea that their crops had been totally destroyed by hail." On the 23rd severe thunderstorms were experienced at Dhubri, False Point and Pooree (at 11-3 P.M.).

Temperature of the Air.

The distribution of temperature in India for February 1891 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. I, II, and III of Plate III. In these charts equal variations of temperature are indicated by lines, the lines being drawn for differences of 2° of variation. The continuous lines indicate that the temperature was in excess by the amount indicated by the number given near the line, and the broken lines, 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 data by means of which these charts have been prepared are given in Table I. The mean maximum and minimum temperatures have been obtained for each station from the observations of the same number of years, *viz.*, 1876 to 1888. 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 amounts, which vary from month to month. But the variations of the mean daily temperature from the normal, as determined by the use of this definition, agrees in almost all cases very closely with the variations, as determined by the use of true daily means based on readings at 10 and 16 hours in ad-

dition to those of themaximum 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.

The mean maximum temperature was more or less in defect over the whole country except Bombay and Madras, Burma, Arakan, and Assam. The deficiency was greatest in the North-West Punjab at Peshawar (8·2°), Dera Ismail Khan (8·4°), and Rawalpindi (8·2°), and decreased in amount southwards and eastwards. It however exceeded 2° over the greater part of Bengal, the Central Provinces, Central India, Rajputana, and the North-Western Provinces, in which it ranged from 2° to 6°. The deficiency was as marked at the hill stations as at the adjacent plain stations, and was greatest at Simla (7·7°), Murree (7·1°), Quetta (6·6°), and Mount Abu (5·3°). The decreased day temperature was hence a very remarkable feature of the meteorology of the month, and the form of the lines of variation in the chart No. 1, Plate III, at once suggests that it was due to some general cause and action which was most efficient in the North-West or West Punjab frontier, and the effect of which extended in a south-easterly direction with decreasing intensity over the whole of Northern and Central India. An examination of the observations proves that it was not due to any local cause, such as increased humidity, cloud amount or rainfall; for in some parts of the area of decreased day temperature the amount of cloud was in excess and in others in defect. The amount of aqueous vapour was above the normal in some parts, but was considerably in defect in others; and the humidity of the air was generally slightly below the average, but was considerably in excess in the Punjab. Finally, in some parts of the area, as in the East Punjab, Behar and Bengal, the rainfall was largely above the normal, whilst in Rajputana, Central India and the greater part of the North-Western Provinces, over which the deficiency exceeded 2°, the rainfall was below the average. The only explanation hence appears to be that it was due to a steady drift of unusually cool air from the regions to the west and north-west of the Punjab and Sind, where the winter snowfall was abnormally heavy and the weather is known to have been remarkably cold.

The mean minimum or night temperature varied less from the normal than the maximum temperature. It was, roughly speaking, in defect to the north of the 16th parallel of latitude and in excess to the south. The deficiency slightly exceeded 2° in two areas—

1st.—In the Central Provinces and Bundelkund, at Saugor (4·2°), Seoni (2·4°), and Nowgong (2·1°).

2nd.—In the Western Himalayas and in the plain districts at their base. The following gives data showing the amount of the deficiency in this area:—

—	Representative station.	Amount of deficiency.
Hills Stations	Murree	—6·1°
	Simla	—3·6°
	Mount Abu	—2·7°
Plains Stations	Roorkee	—2·2°
	Sialkot	—2·2°
	Delhi	—2·1°
	Peshawar	—2·2

The mean minimum temperature of the month was, on the other hand, more than 2° in excess in Lower Burma and the Carnatic and Circars. The excess was greatest at Salem (4·1°), Trichinopoly (3·0°), and Moulmein (3·0°).

The lowest night temperatures of the month were almost universally registered on the nights of the 6th or 7th, and hence after the first storm of the month filled up in North-Eastern India. In some parts of the North-Western Provinces and Bengal lower temperatures were registered than have hitherto been recorded in the month of February. The following give a few of the more noteworthy night temperatures of this cold period, together with the lowest temperatures recorded previously at the same stations in the month of February:—

DISTRICT.	Representative station.	Date.	The lowest temperature in February 1891.	Lowest minimum temperature previously registered in February.
Bengal	Calcutta	7th	46·3	46·2 in 1883
	Hazaribagh	6th	39·9	40·4 in 1886
	Patna	7th	41·3	41·3 in 1886
	Purneah	7th	34·7	37·7 in 1887
North-West Provinces.	Allahabad	7th	37·5	38·0 in 1883
	Roorkee	7th	33·8	34·2 in 1876
	Bareilly	7th	37·0	37·4 in 1887

In North-Western India and at the hill stations the lowest minimum temperatures were from 2° to 4° higher than the lowest recorded previously.

In consequence of the abnormal conditions prevailing to the north and north-west of the Punjab, the mean temperature of the month was in defect over the whole of India to the north of a line joining Ratnagiri and Gopalpur, and was in excess to the south of that line and in Burma. The deficiency was greatest in the Punjab at the following stations:—

STATION.	Amount of deficiency.
	°
Peshawar	—5·2
Rawalpindi	—5·0
Sialkot	—4·7
Dera Ismail Khan	—4·6
Lahore	—4·2

It exceeded 2° in Sind, the Punjab, Rajputana and the greater part of the North-Western Provinces and Central Provinces.

The deficiency was as large at the hill stations as at adjacent plain stations, as is shown by the following data:—

HILL STATION.	Amount of deficiency.	NEIGHBOURING PLAIN STATION.	Amount of deficiency.
	°		°
Quetta	—3·4	Jacobabad	—2·7
Murree	—6·6	Rawalpindi	—5·1
Simla	—5·7	Ludhiana	—3·6
Chakrata	?	Roorkee	—3·2
Mount Abu	—4·0	Deesa	—0·6
Pachmarhi	—2·0	Hoshangabad	—2·0

The history of the larger temperature changes during the month is very interesting, as they show in a very striking manner the influence of the cyclonic storms of the cold weather in modifying the temperature conditions of the period. The first disturbance lasted from the 1st to the 5th, and was, as usual, preceded by a warm, and followed by a cool wave. The former was throughout this period immediately in front of the primary disturbance, and was well defined, whilst the latter was more diffused and extensive. The following gives data illustrating the progress of each:—

WARM WAVE.			COOL WAVE.		
Date.	Station.	Variation of mean temperature.	Date.	Station.	Variation of mean temperature.
1st Feb.	Quetta	+8·4	2nd Feb.	Quetta	—18·8
	Rajkot	+8·8		D. I. Khan.	—6·7
	Deesa	+6·9	3rd ,,	Quetta	—12·3
2nd ,,	Ajmere	+13·4		Kurrachee	—8·2
	Sambhar	+11·4		Deesa	—7·1
3rd ,,	Hazaribagh	+8·8	4th ,,	Rajkot	—9·4
	Sutna	+8·2		Neemuch	—6·7
4th ,,	Burdwan	+7·1		Jeypore	—6·1
	Dhubri	+7·0	5th ,,	Neemuch	—8·5
5th ,,	Sibsagar	+6·1		Delhi	—8·2
	Tounghoo	+4·2		Agra	—8·0
			6th ,,	Nowgong	—11·4
				Saugor	—11·1
				Jubbulpore	—10·9
			7th ,,	Purneah	—12·4
				Hazaribagh	—11·1
			8th ,,	Burdwan	—10·1
				Saugor Island	—10·6

A second cool wave appeared on the North-Western Frontier on the 8th, and travelled slowly eastwards. The following data illustrate its eastward progress:—

DATE.	Station.	Variation of mean temperature of 24 hours preceding 8 A.M. of day from the normal.
February 8th	Quetta	—12·9
	Peshawar	—10·9
,, 9th	Malegaon	—12·8
	Indore	—11·5
	Ludhiana	—10·9
	Jeypore	—10·7
,, 10th	Khandwa	—12·7
	Saugor	—11·2
	Nowgong	—10·2
,, 11th	Saugor	—8·7
	Agra	—8·3
,, 12th	Hoshangabad	—10·7
	Jubbulpore	—9·6

The temperature conditions at this time, notwithstanding skies were almost free from cloud, were very abnormal, as over by far the greater part of India there was a remarkable depression of temperature, which was even more strongly marked in the day than in the night temperature. The following table giving the variations of the maximum minimum and mean temperatures of the 24 hours preceding 8 A.M. of the 9th in different parts of India shows clearly the anomalous temperature conditions prevailing at the time:—

DISTRICT.	Mean amount of cloud.	VARIATION OF		
		Mean maximum temperature of day from the normal.	Mean minimum temperature of day from the normal.	Mean daily temperature from normal.
Burma	6·0	+1·4	+4·4	+2·9
Bengal and Assam	1·3	—4·2	—4·3	—4·3
North-West Provinces	0·4	—7·5	—7·7	—7·6
Punjab	0	—9·6	—8·6	—9·1
Sind and Rajputana	1·7	—9·8	—7·8	—8·8
Guzerat and Central India	0	—10·1	—8·8	—9·5
Central Provinces	0·8	—8·4	—9·1	—8·8
Bombay	0	—4·1	—4·8	—4·5
Madras	3·6	+0·6	+4·3	+2·5

On the 11th February another cold wave appeared in North-Western India and travelled eastwards. The following data illustrate its progress:—

DATE.	Station.	Variation of mean daily temperature from normal.
11th	Peshawar	—10·6
	Hyderabad	— 9·4
12th	Hyderabad	—11·8
	Ludhiana	—10·9
13th	Sirsa	— 8·1
	Sambhar	— 7·5
14th	Delhi	— 5·8
	Agra	— 5·9
15th	Sutna	— 5·6
	Seoni	— 5·5
16th	Purneah	— 5·1
	False Point	— 5·5
17th	Saugor Island	— 4·1

The second and third cool waves of the month described above were due to slightly different actions from those which produced the first cool wave, which was due to the advance of dry north-westerly winds, as the first storm of the month drifted eastwards. The second and third cool waves were apparently due to a flow of cool air across the North-Western Frontier accompanying a rapid rise of pressure. The barometer rose rapidly on the 8th in Upper India and Beluchistan, and fell slightly during the next 24 hours, when a further rapid rise occurred, and on the 11th pressure was abnormally high in Upper India and the adjacent districts of the North-Western Provinces.

Whilst this third cool wave was advancing eastwards across Central India and Bengal, temperature increased rapidly in Western, North-Western and Central India, and

was considerably above the normal over the whole of that area, except the Indus Valley, from the 16th to the 22nd. On the 18th temperature was generally above the average, and the excess was greatest in Central India, Rajputana, the North-Western Provinces and Bombay, as is shown by the following data for the 24 hours preceding 8 A.M. of the 19th:—

DISTRICT.	VARIATION OF		
	Mean maximum temperature of day from normal.	Mean minimum temperature of day from normal.	Mean daily temperature from normal.
Punjab	—3·4	+0·9	—1·3
Sind and Rajputana	+2·6	+2·8	+2·7
North-West Provinces	+2·5	+2·4	+2·5
Guzerat and Central India	+5·6	+2·0	+3·8
Central Provinces and Berar	+0·3	+3·4	+1·9
Bengal	+0·3	+0·1	+0·2
Bombay	+3·8	+3·7	+3·8
Madras	—1·7	+2·1	+0·2
Burma	—0·7	—1·1	—0·9

The area of greatest excess of temperature on that day is defined by Jhansi (+6·8°), Deesa (+7·8°), Surat (+5·5°), Ratnagiri (+6·1°), and Karwar (+5·6°).

From this period to the end of the month temperature conditions were chiefly determined by the rainfall of the second disturbed period of the month, the temperature being largely reduced below the normal in the two areas of rainfall; one in North-Western and Upper India, and the other in North-Eastern India (Assam, Bengal and Behar), whilst between the two was an area of increased temperature, including Rajputana, Central India and the North Deccan. The conditions are fairly represented by the temperature means of the 28th, which are given in the following table:—

METEOROLOGICAL AREA.	Province.	VARIATION FROM NORMAL		
		Of maximum temperature of previous 24 hours.	Of minimum temperature of previous 24 hours.	Of mean temperature of previous 24 hours.
Eastern rainfall area	Burma	—1.7	—1·2	—1·5
	Bengal and Assam	—3·3	+0·3	—1·5
Intermediate area	N.-W.-Provinces	—1·5	+2·8	+0·6
	Guzerat and Central India	+4·4	+1·6	+3·0
	Sind and Rajputana	—2·2	+5·1	+1·5
	Bareilly	+1·2	+1·3	+1·3
Western rainfall area	Punjab	—11·9	+0·9	—5·5

It may be interesting to note that the dependence of the meteorology of India upon that of Central Asia is shown as strikingly by the temperature data as by the barometric pressure data.

The following table shows that the abnormally low temperature of the month in Northern India was equally a feature of Leh in Ladakh and of Meshed on the Perso-Afghan Frontier, 900 miles to the west-north-west of Lahore, and separated from the Punjab by the mountains of Northern and Central Afghanistan:—

DATE.	MESHED.		KAILANG.		LEH.		PESHAWAR.		LAHORE.	
	Mean temperature.	Minimum temperature.	Mean temperature.	Minimum temperature.	Mean temperature.	Minimum temperature.	Mean temperature.	Minimum temperature.	Mean temperature.	Minimum temperature.
1st	29·0	21·0	26·3	24·0	19·6	13·3	52·9	43·9	58·9	48·5
2nd	15·8	9·0	29·1	26·0	23·2	16·5	45·3	40·4	56·9	52·0
3rd	12·5	1·0	18·2	7·0	20·3	9·7	43·6	38·9	51·2	44·1
4th	17·0	3·0	16·6	5·0	18·7	5·5	45·1	35·9	50·0	43·6
5th	19·0	4·0	13·5	—3·0	7·6	—6·2	45·1	33·9	47·2	39·1
6th	21·3	7·5	17·5	1·5	5.6	—7·8	46·1	35·9	48·3	36·2
7th	20·5	5·0	21·8	17·0	12·4	4·1	43·8	34·4	48·5	36·2
8th	24·5	10·0	16·5	9·5	13·7	0·5	41·6	29·9	47·0	35·2
9th	23·0	10·0	15·0	6·5	10·6	—1·8	42·6	31·9	46·3	33·2
10th	21·5	7·0	15·4	6·2	6·1	—7·0	44·1	33·9	46·3	33·2
11th	28·5	17·0	20·7	14·0	8·1	—5·0	41·6	30·9	48·5	36·7
12th	32·2	21·0	19·7	10·0	12·1	—2·5	44·4	33·9	47·8	35·2
13th	32·5	28·0	20·0	15·0	12·6	1·3	49·4	39·9	51·7	41·1
14th	32·5	20·0	16·8	5·0	16·4	4·8	49·1	36·9	54·0	40·6
TOTAL RANGE DURING THE PERIOD	20·0	27·0	15·6	29·0	17·6	24·3	11·3	14·0	12·6	18·8

Winds.

The winds in the Gangetic plain in the month of February usually blow more or less steadily from the west. In February 1891 they were on the whole steadier and stronger than usual. The following gives data for five representative stations :—

Station.	Direction.		Steadiness.		Velocity.	
	Mean wind direction, February 1891.	Normal mean wind direction, February.	Percentage, February 1891.	Average percentage, February.	Daily wind velocity, February 1891.	Normal daily wind velocity, February.
Ludhiana . .	N. 57° W.	N. 48° W.	45	39	65	39
Agra . . .	N. 55° W.	N. 75° W.	58	38	110	97
Allahabad . .	N. 67° W.	N. 66° W.	28	25	92	69
Patna . . .	S. 84° W.	N. 79° W.	52	47	95	71

A more important feature was the largely increased velocity at the hill stations, due chiefly to the disturbed weather in the hills. The following gives data for stations in the Punjab and North-Western Provinces Himalayas :—

Station.	Steadiness.		Velocity.	
	Percentage, February 1891.	Average percentage, February.	Daily wind velocity, February 1891.	Normal daily wind velocity, February.
Murree	72	29	234	196
Chakrata . . .	8	3	148	126
Ranikhet . . .	12	24	118	51
Darjeeling . . .	36	33	168	121

The abnormal steadiness of the south-east winds at Murree is very striking, especially when compared with their unsteadiness at Chakrata and Ranikhet. In Bengal the north-westerly winds which prevail at the commencement of the month are usually replaced by local southerly breezes before the end of the month. In consequence of the peculiar conditions of Northern India, north-westerly winds continued steadily until the end of the month, the only interruption being during the depression and disturbance of the third week of the month. The following gives data in illustration :—

Station.	Direction.		Steadiness.		Velocity.	
	Mean wind direction, February 1891.	Normal mean wind direction, February.	Percentage, February 1891.	Average percentage, February.	Daily wind velocity, February 1891.	Normal daily wind velocity, February.
Calcutta . .	N. 39° W.	S. 81° W.	27	23	70	86
Saugor Island .	N. 55° W.	S. 50° W.	22	23.	251	189
Dacca . . .	N. 82° W.	S. 76° W.	42	35	91	63

Winds were on the whole less steady than usual, although they were somewhat stronger in Western India, but the variations were slight and only significant as showing a steadier and stronger drift from the north than usual.

Winds were on the whole normal in Madras and Burma. Winds at Port Blair, and probably in the centre of the Bay of Bengal, were less steady, although stronger, and had a very strong easterly component. Winds were also abnormally strong and steady at Aden.

Humidity and cloud.

The air contained, on the average of the month, less aqueous vapour than usual over the whole of Northern India or in the Punjab, Sind, Rajputana, the North-Western Provinces, Behar, Bengal, and Orissa. The deficiency was moderately large in Bengal, averaging from 10 to 20 per cent. of the normal amount. In consequence of the abnormally low temperature, the humidity percentage was, on the other hand, above the normal over a part of the area of deficient amount of aqueous vapour, including the Punjab and the western districts of the North-Western Provinces. On the other hand, the air was somewhat drier than usual in Behar and Bengal. In the Peninsula the variations in the amount of aqueous vapour present were small and unimportant. The mean humidity of the month was below the normal in Bombay and Burma, and was above in the Central Provinces.

Cloud amount is usually small over nearly the whole of India, except North-Western or Upper India and the hill districts in February. The cloudy periods were determined by the disturbances of the month, and hence extended from the 1st to the 5th in Northern India, from the 11th to the 18th in the Peninsula, and from the 19th to the 24th in Northern India. The average cloud amount of the month was more or less in excess in three areas, *viz.* 1st, the Punjab, Upper Sind and the western districts of the North-Western Provinces; 2nd, the Central Provinces; 3rd, Bengal, Assam, and Burma.

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 offices in the various provinces, and are published in the provincial Gazettes. A weekly statement of the rainfall is telegraphed to the Simla Meteorological Office from every district, and a summary of this information is published in the *Gazette of India* weekly.

The charts illustrating the distribution of rainfall in February are based in part upon the rainfall data of the meteorological observatories throughout India, and in part on the rainfall information telegraphed to Simla by district officers.

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 155 meteorological stations. The distribution is shown by means of isohyetic lines, or lines of equal amounts of rainfall, the numbers attached to each line indicating the rainfall. The line of no rainfall is indicated by two parallel lines separated by a short interval, one continuous and the other dotted, the latter facing the districts of no rainfall.

The second chart, illustrating the distribution of the rainfall of the month is given, in Plate V, and shows by figures the variations of the mean actual rainfall of the month from the normal rainfall in each of the 51 meteorological districts into which India and Burma have been divided for purposes of comparing crops, rainfall, &c. The data of the chart are derived from the rainfall information telegraphed weekly by district officers, and of which a summary is given in the following table :—

Province.	Division.	Rainfall of week ending February 7th.	February 14th.	February 21st.	February 28th.	Total rainfall of period, from 1st to 28th February.	Average rainfall of period.	Variation of rainfall of period.
		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Burma	Tenasserim	0·42	0·10	0·21	0	0·73	0·16	+0·57
	Lower Burma	0	0·08	0·30	0	0·38	0·14	+0·24
	Central do.	0	0·11	0	0	0·11	0·04	+0·07
	Upper do.	0	0·02	0	0·01	0·03	?	?
	Arakan	0	0	0	0·03	0·03	0·07	−0·04
Bengal and Assam	Eastern Bengal	0	0	1·67	0·44	2·11	0·99	+1·12
	Assam (Surma)	0·01	0	0·16	1·59	1·76	1·73	+0·03
	Do. (Brahmaputra)	0·03	0·01	0·15	1·36	1·55	1·25	+0·30
	Deltaic Bengal	0	0·04	2·10	0·33	2·47	1·15	+1·32
	Central do.	0	0	1·50	0·14	1·64	0·78	+0·86
	North do.	0	0	0·95	0·36	1·31	0·41	+0·90
	Orissa	0	0·01	0·03	0·65	0·69	0·88	−0·19
	Chutia Nagpur	0	0·17	0·39	0	0·56	0·70	−0·14
	Behar (South)	0	0	0·40	0	0·40	0·39	+0·01
	Do. (North)	0	0	0·48	0·42	0·90	0·40	+0·50
North-Western Provinces and Oudh.	North-Western Provinces (East)	0	0	0	0·26	0·26	0·44	−0·18
	Oudh (South)	0	0	0·01	0·02	0·03	0·21	−0·18
	Do. (North)	0	0	0	0·14	0·14	0·49	−0·35
	North-Western Provinces (Central)	0	0	0	0·04	0·04	0·27	−0·23
	Do. do. (West)	0·05	0	0	0	0·05	0·44	−0·39
	Do. do. (Submontane)	0·21	0	0·14	0·16	0·51	1·02	−0·51
Punjab	Punjab (South)	0·06	0	0·04	0·07	0·17	0·58	−0·41
	Do. (Central)	0·04	0	0	0·02	0·06	0·71	−0·65
	Do. (Submontane)	0·23	0	0·56	0·49	1·28	1·35	−0·07
	Do. (Hill Districts)	1·05	0·09	1·66	2·24	5·04	3·69	+1·35
	Do. (North-West)	1·31	0·20	0·54	0·98	3·03	1·67	+1·36
	Do. (West)	0·05	0	0·03	0·23	0·91	0·54	+0·37
Bombay and Malabar Coast Districts (Madras)	Malabar	0	0·21	0·25	0·19	0·65	0·35	+0·30
	Madras (South Central)	0	0·86	1·24	0·19	2·29	0·12	+2·17
	Coorg	0	0	0·07	0	0·07	0·13	−0·06
	Mysore	0	0·02	0·18	0	0·20	0·11	+0·09
	Konkan	0	0	0·03	0	0·03	0·03	0
	Bombay Deccan	0	0·08	0·35	0	0·43	0·08	+0·35
	Hyderabad (North)		?	?	?	?	?	?
	Khandeish	0	0·07	0·07	0	0·14	0·09	+0·05
Central Provinces and Berar.	Berar	0	0·80	0·41	0	1·21	0·10	+1·11
	Central Provinces (West)	0	0·44	0·20	0	0·64	0·26	+0·38
	Do. (Central)	0	0·59	0·12	0	0·71	0·50	+0·21
	Do. (East)	0	0·35	0·12	0·05	0·52	0·39	+0·13

Province.	Division.	Rainfall of week ending February 7th.	February 14th.	February 21st.	February 28th.	Total rainfall of period from 1st to 28th February.	Average rainfall of period.	Variation of rainfall of period.
		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Bombay (North)	Guzerat	0	0	0	0	0	0·10	—0·10
	Kattiawar	0·05	0	0	0	0·05	0·09	—0·04
	Sind	0·05	0·02	0·03	0·16	0·26	0·20	+0·06
Rajputana and Central India.	Central India (East)	0	0·01	0	0	0·01	0·24	—0·23
	Rajputana (East) and Central India (West)	0	0	0	0	0	0·18	—0·18
	Rajputana (West)	0	0	0	0	0	0·14	—0·14
Madras	East Coast (North)	0	0	0·44	0·21	0·65	0·44	+0·21
	Do. (do.) (a)	0	0	0	0·40	0·40	?	?
	Hyderabad (South)	0	0	0·22	0	0·22	0·17	+0·05
	Madras (Central)	0	0·09	0	0·01	0·10	0·12	—0·02
	East Coast (Central)	0	0·53	0	0·14	0·67	0·16	+0·51
	East Coast (South)	0	1·33	0·37	0	1·70	0·29	+1·41
	Madras (South)	0	1·25	0·71	0·11	2·07	0·61	+1·46

The distribution of the rainfall is shown fully in the preceding table, and the periods of its occurrence have also been indicated under the pressure section. The following gives a summary:—

Moderate to heavy rain was received in Beluchistan, Upper Sind, the Punjab, and north-western districts of the North-Western Provinces on the 1st, 2nd and 3rd. It was heaviest in the northern districts of Peshawar and Rawalpindi, and in the hill districts. Murree received nearly 5 inches during this period. With the exception of a few showers in the Punjab hill districts no rain fell again until the 11th. From the 11th to the 18th light to heavy rain, due chiefly to thunderstorms, and hence very irregularly distributed, was received in two areas,—1st, Berar and the Central Provinces, and 2nd, Southern India (or Madras, south of Lat. 15° N. and Travancore). The most remarkable fall was 5·27 inches on the 16th at Trichinopoly. Light to moderate rain was received during the second cold-weather storm of the month in Beluchistan, Upper Sind and the Punjab on the 18th, 19th and 20th, but it was chiefly confined to the hill and submontane districts of the East Punjab. Numerous thunderstorms and hailstorms occurred during the next three days, *i.e.* from the 21st to the 24th, in Assam, Bengal, Behar and the North-Western Provinces, which gave exceptionally heavy rain for the season to Central Bengal. Amongst the more noteworthy rainfalls during the period were the following:—

Date.	Station.	Amount of rainfall.
		Inches.
22nd February	Bogra	4·15
	Mymensingh	2·54
	Jessore	2·35
23rd ditto	Durbhunga	2·71 ?
	Burrisal	2·63

A very feeble disturbance gave moderate but general rain to Beluchistan and the Punjab on the 25th, 26th and 27th, and much snow in the hill districts. The precipitation at Simla on the 26th was 1·56 inches, and at Murree on the 27th 3·34 inches.

The chart (Plate IV) shows that there was absolutely or practically (*i.e.* less than ·1 inch) no rainfall in Lower Sind, Rajputana, nearly the whole of Central India, the Bombay Coast districts and Guzerat, and the greater part of Burma (except the districts near the Gulf of Martaban), and very little in the North-Western Provinces and Hyderabad. The same chart shows that there were four areas of moderate or heavy rainfall:—

(*a*) The Punjab, Upper Sind and Beluchistan, and the adjacent hill districts. The rainfall in this area ranged from a tenth of an inch to 5 inches in the plains, and probably exceeded 10 inches in many portions of the hill districts.

(*b*) Bengal, more especially the central and southern districts, in which the rainfall of the month varied between 2 and 5 inches.

(*c*) Berar and the Central Provinces.

(*d*) Southern India, in which the rainfall was very irregularly distributed, and varied in amount from ½ to 6 inches.

In these four districts the rainfall was more or less above the average, and in Berar, the Central Provinces and Southern India it was very exceptional in character, as is shown by the following statement:—

Province.	Division.	Rainfall. Normal.	Actual.	Variation.
Madras	Madras East Coast (South)	0·29	1·70	+1·41
	Madras (South Central)	0·12	2·29	+2·17
	Madras (South)	0·61	2·07	+1·46
Berar	Berar	0·10	1·21	+1·11
Central Provinces	Central Provinces	0·38	0·62	+0·24
Bengal	East Bengal	0·99	2·11	+1·12
	South do.	1·15	2·47	+1·32
	Central do.	0·78	1·64	+0·86
	North do.	0·41	1·31	+0·90
Punjab	North-West Punjab	1·67	3·03	+1·36

This shows that the rainfall was most exceptional in southern India and Berar, and in the former area it, to some extent, alleviated the drought which had prevailed during the north-east monsoon months of December and January in the Carnatic.

Bengal and the Punjab practically received about double the normal rainfall of the month. These two provinces usually obtain moderate rain during the month, and hence the precipitation in these areas, although much larger than usual, was much less remarkable than that in Southern India and Berar.

Explanation of Tables.

Table I gives an abstract of the meteorological observations at 8 A.M. daily, taken at 155 stations in India during the month of February 1891.

In this table the observing stations are grouped under two sets of divisions. According to the first arrangement India and Burma are divided into eleven large meteorological areas or provinces. These divisions have been selected in consultation with the Medical Department. The climatic conditions of each area are fairly uniform, and they hence are presumed to form suitable areas for the discussion of the relation between disease and meteorology. The names of these divisions are printed in bold type, and the mean variations of the more important meteorological data, more especially temperature, are given opposite to each in prominent figures.

Each of these larger divisions is subdivided into smaller meteorological areas, of which there are 51 in all. This subdivision was made in consultation with the Revenue and Financial Departments. In each of these smaller areas the distribution and character of the rainfall are fairly uniform, and the staple crops in each are hence the same. This subdivision will, it is hoped, enable a more exact comparison to be made between crops and rainfall than has been hitherto possible.

The headings of the columns in the great majority of cases explain themselves. The figures in the third column, "Variation from normal," are obtained by taking in each case the difference between the mean actual barometer (reduced for temperature, but not to sea level or constant gravity) and the normal means obtained from the observations of the twelve-year period 1877—88.

The "Mean daily temperature" is assumed in table I to be the mean of the maximum and minimum. It is chiefly utilized in order to obtain the mean variation of the temperature of the month from the normal.

In obtaining the figures for the column headed "Number of rainy days," a rainy day is assumed to be one on which a fall of a tenth of an inch or upwards has been recorded. A fall of less than a tenth of an inch is practically of no value for agricultural purposes in India, and it has not been found possible to secure the accurate record of rainfalls of less than a tenth of an inch at a great majority of the rainfall-recording stations.

Table II gives an abstract of the observations recorded at 10 A.M. and 4 P.M. at 85 second class observatories throughout India, Burma and the adjacent regions. This table is intended in part to supplement Table I, and hence information given in full in the latter table, as for example rainfall, is not reported in Table II. This table is intended to give for the month, so far as is possible, all the information furnished hitherto in the Appendix A of the Annual Report on the meteorology of India. The methods of calculating the means have been very fully explained in the Annual Reports, to which the reader is referred for complete information. The data of the mean daily pressure, the figures of which are given in the sixth column, are the means of the 10- and 16-hour observations, with corrections obtained from a comparison of the 10- and 16-hour observations of the same or a neighbouring observatory, with a series of hourly observations at the same observatory.

The mean temperature is calculated by the formula $\text{mean} = \frac{\textit{maximum} + \textit{16 hours} + \textit{2 minimum}}{4}$ by applying a constant correction for each month, derived from the hourly observations of the same or of a neighbouring station.

The mean daily vapour tension and humidity are the averages of the values for 10 A.M., 4 P.M., and the minimum readings and the mean daily cloud is the average of the mean amounts for 10 and 16 hours.

The mean wind direction for each month is the trigonometrical resultant of the winds given under each of the eight cardinal points, and is calculated by means of Lambert's formula, in which an equal weight or value is given to every wind.

It should be noted that in the preceding discussion in speaking of the maximum or minimum, or mean temperature the total wind or rainfall of a given day, as for example the 5th, the maximum, &c., of the 24 hours preceding 8 A.M. of the 5th, is meant. This definition has been adopted to avoid confusion. As the observations are taken at 8 A.M., a part of them refer to 8 A.M. of that day and a part to the previous 24 hours, and, therefore, including a portion of the previous civil day. It is found most convenient to use the same day to designate and define both classes of observations.

Table

Abstract of observations taken at 8 A.M. at 155 stations

Meteorological Province or District.	Station.	Height of Station in feet.	Pressure, 8 A.M., in inches. 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.	Temperature of Air. 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.
Burma Coast and Bay Islands.		...	...	+·010	...	...	...	...	...	...	...	89·4	+1·1	67·9	+1·2	78·7	+1·2	21·5	...	...	...	...	30·0
Bay Islands	Port Blair	61·16	29·937	?	29·929	30·016	18th	29·816	4th	·200	79·5	87·8	?	76·5	?	82·2	?	11·3	90·3	28th	72·6	19th	17·7
Tenasserim	Mergui	96·27	29·902	?	29·929	29·996	13th	29·793	4th	·203	76·8	83·0	?	68·1	?	78·6	?	20·9	91·1	11th, 13th & 22nd.	65·4	15th & 16th.	25·7
	Tavoy	26·26	30·006	?	29·964	30·099	14th	29·867	1st	·232	74·2	89·8	?	69·8	?	79·8	?	20·0	92·2	12th & 27th	66·2	28th	26·0
	Moulmein	93·79	29·927	+·041	29·961	30·033	13th	29·784	1st	·249	73·6	92·5	+1·3	70·2	+3·0	81·4	+2·2	22·3	91·5	10th & 26th.	64·9	7th	29·6
	Toungoo	181·10	29·819	+·003	29·950	29·923	11th	29·669	1st	·254	67·4	91·0	+0·3	61·3	+0·4	76·2	+0·4	29·7	93·7	14th & 15th.	50·6	2nd	43·1
Lower Burma	Rangoon	40·69	29·973	+·002	29·951	30·078	13th	29·821	4th	·257	70·1	93·3	+1·1	67·0	+2·1	80·2	+1·6	26·3	96·8	11th	59·8	1st	37·0
	Bassein	21	29·996	+·014	29·955	30·089	11th	29·845	4th	·244	71·2	90·7	+1·4	65·6	+1·9	78·2	+1·7	25·1	94·2	15th	59·5	2nd	34·7
	Diamond Island	41	29·974	—·005	29·951	30·068	12th	29·833	4th	·235	77·2	85·6	+1·6	70·0	—2·1	77·8	—0·3	15·6	89·8	10th & 14th.	67·1	2nd	22·7
Arrakan	Akyab	20·44	30·015	+·003	29·979	30·120	12th	29·877	4th	·243	65·7	85·3	+0·8	62·8	+2·0	74·1	+1·4	22·5	91·2	12th	58·1	7th	33·1
Burma, Inland		...	...	+·017	...	...	...	...	...	...	...	84·5	+0·6	54·3	—0·1	69·5	+0·3	30·3	...	...	...	...	42·9
Central Burma	Thayetmyo	134	29·873	+·017	29·955	29·982	11th	29·720	4th	·262	65·8	92·9	+0·6	55·5	—0·1	74·2	+0·3	37·4	95·8	5th	44·9	1st	50·9
Upper Burma	Mandalay	?	29·762	?	?	29·893	11th	29·603	4th	·290	65·3	88·8	?	60·1	?	74·4	?	28·7	92·5	16th	55·0	8th	37·5
	Kindat	?	29·652	?	?	29·795	7th	29·508	4th	·287	56·3	77·6	?	53·1	?	65·5	?	24·5	88·8	10th	49·0	7th & 8th.	39·8
	Bhamo	?	29·601	?	?	29·769	11th	29·444	4th	·325	55·1	78·8	?	48·6	?	63·7	?	30·2	87·0	5th	43·5	7th & 8th.	43·5
Assam.		...	...	+·018	...	...	...	...	...	...	...	77·1	+0·7	53·8	—0·3	65·4	+0·2	23·3	...	...	...	...	35·1
Assam (Surma)	Silchar	104·3	29·966	+·030	30·028	30·120	11th	29·777	4th	·343	59·9	80·5	+0·8	53·7	—1·2	67·1	—0·2	26·8	84·4	11th & 15th.	45·5	7th & 8th.	38·9
Bhramaputra	Sibsagar	333	29·720	+·004	30·028	29·860	11th	29·492	4th	·368	55·8	74·5	+2·0	52·9	—0·1	63·7	+1·0	21·6	79·0	5th	45·1	8th	33·9
	Dhubri	115·34	29·934	+·021	30·011	30·123	11th	29·677	4th	·446	57·6	76·3	—0·8	54·7	+0·4	65·5	—0·2	21·6	80·3	15th	47·8	7th	32·5
Bengal and Orissa		...	...	+·027	...	...	...	...	...	...		79·4	—1·5	56·4	+0·1	68·0	—0·7	23·0	...	...	...	...	39·0
East Bengal	Chittagong	86·70	29·967	+·020	30·005	30·089	11th	29·817	4th	·272	62·9	81·8	+0·5	56·6	—1·8	69·2	—0·7	25·2	86·7	3 dates	46·5	7th	40·2
	Lungleh	?			Not recorded.						58·3	69·2	?	32·5	?	50·8	?	36·7	70·9	5 dates	18·4	28th	52·5
	Noakholly	42·73	30·015	?	30·007	30·150	11th	29·855	4th	·295	63·4	79·0	?	55·2	?	67·1	?	23·8	84·0	11th & 13th.	44·0	7th	40·0
	Comillah	34·75	30·023	?	30·007	30·173	11th	29·838	4th	·335	61·1	79·7	?	54·4	?	67·1	?	25·3	84·4	13th	45·1	7th & 8th.	39·3
	Serajgunj	46·37	30·005	?	30·003	30·168	11th	29·791	4th	·377	60·0	78·7	?	52·9	?	65·8	?	25·8	83·9	22nd	43·3	6th	40·6
	Dacca	21·70	30·032	+·026	30·003	30·186	11th	29·833	4th	·353	61·9	80·1	—2·4	57·2	—0·5	68·6	—1·5	22·9	85·6	22nd	48·7	7th	36·9
	Burrisal	12	30·044	+·045	30·002	30·187	11th	29·865	4th	·322	64·1	79·1	+0·3	57·5	+0·3	68·3	+0·3	21·6	83·3	14th & 20th.	46·6	7th	36·7
	Mymensingh	55·18	30·001	+·027	30·012	30·161	11th	29·797	4th	·364	60·1	77·4	—1·4	54·1	+2·1	65·8	+0·4	23·3	81·7	22nd	46·1	7th	35·6
Deltaic Bengal	Furreedpore	39	30·030	?	30·019	30·187	11th	29·826	4th	·361	61·4	76·7	?	54·9	?	65·8	?	21·8	84·3	4th	46·0	6th & 7th.	38·3
	Jessore	33·29	30·019	+·024	30·000	30·177	11th	29·826	4th	·351	62·5	79·7	—3·7	57·0	+0·5	68·4	—1·6	22·7	85·2	4th	46·4	7th	38·8
	Calcutta	21·38	30·043	+·029	30·010	30·204	11th	29·859	4th	·345	64·5	80·3	—1·5	58·6	—1·3	69·5	—1·4	21·7	85·0	4th & 23rd.	46·3	7th	38·7
	Saugor Island	25·30	30·031	+·028	30·001	30·183	11th	29·851	4th	·332	66·7	78·8	—2·3	63·0	—2·3	70·9	—2·3	15·8	84·2	23rd	49·7	8th	34·5
	Kishnaghur	46·64	30·008	?	30·013	30·170	11th	29·828	4th	·342	63·5	81·2	?	54·7	?	68·0	?	26·5	88·5	4th	42·3	7th	46·2
	Midnapore	148·88	29·912	?	30·014	30·069	11th	29·739	4th	·330	66·1	84·9	?	60·4	?	72·7	?	24·5	92·3	4th	48·2	7th	44·1
Central Bengal	Bankoora	300	29·718	?	29·984	29·883	11th	29·560	4th	·323	63·0	81·7	?	58·6	?	70·2	?	23·1	90·1	4th	46·9	7th	43·2
	Raneegunge	333	29·726	?	30·020	30·904	11th	29·555	4th	·349	62·9	80·3	?	57·6	?	69·0	?	22·7	88·7	4th	46·6	7th	42·1
	Burdwan	99·09	29·970	+·035	30·020	30·130	11th	29·784	4th	·346	63·2	81·3	—2·1	57·5	—0·6	69·4	—1·4	23·8	89·1	4th	45·2	3 dates	43·9

I.

in India, Burma, &c., in February 1891.

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 of 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.	Normal rainfall for period 1st January to 28th February.	Variation from normal of period.	Station.	Meteorological Province or District.
...	...	...	...	...	...	...	...	..	...	...	..	...	...	...	...	...	...	1·54	0·22	+1·32	...	...	...	**Burma Coast and Bay Islands.**	
...	6	5	2	6	2	1	2	4	6	5	+20	84	·846	4·2	3	...	...	2·77	?	?	3·40	?	?	Port Blair .	BAY ISLANDS.
...	3	4	1	9	2	2	...	7	3	2	+50	82	·763	3·2	6	...	...	5·03	?	?	5·26	?	?	Mergui .	TENASSERIM.
28	...	...	...	...	...	...	...	...	1	?	?	89	·760	1·7	3	...	...	1·42	0·53	+0·89	1·84	?	?	Tavoy.	
...	7	10	3	3	...	1	1	3	3	2	+50	86	·713	1·1	2	...	...	0·76	0·15	+0·61	0·76	0·15	+0·61	Moulmein.	
8	10	2	...	5	2	...	...	1	2	2	00	81	·556	2·0	0	...	...	0·06	0·17	−0·11	0·06	0·26	−0·20	Toungoo.	
...	3	2	1	...	...	6	10	6	3	4	−25	85	·634	1·2	3	...	...	3·42	0·11	+3·31	3·42	0·29	+3·13	Rangoon .	LOWER BURMA.
9	...	3	...	...	...	...	...	16	5	4	+25	87	·664	3·1	1	...	...	0·38	0·32	+0·06	0·38	0·39	−0·01	Bassein.	
...	13	2	1	...	...	...	...	12	6	7	−14	71	·689	3·2	0	...	...	0	0·10	−0·10	0	0·34	−0·34	Diamond Island.	
...	17	10	...	...	...	...	...	1	3	3	00	78	·499	3·3	0	...	...	0	0·13	−0·13	0	0·24	−0·24	Akyab .	ARRAKAN.
...	...	...	.	...	...	...	..	...	...	...	...	...	...	...	..	...	...	0·12	?	?	...	...	...	**Burma, Inland.**	
...	4	3	1	...	3	4	8	5	4	4	00	67	·433	0·9	0	...	...	0	0	0	0	0	0	Thayetmyo	CENTRAL BURMA.
26	...	...	...	...	...	1	...	1	?	?	?	76	·475	2·5	0	...	...	0	?	?	0	?	?	Mandalay .	UPPER BURMA.
21	2	1	...	...	...	...	...	...	2	?	?	92	·440	0	1	...	...	0·42	?	?	0·42	?	?	Kindat.	
...	...	1	...	3	...	7	...	16	?	?	?	81	·381	2·5	0	...	...	0·06	?	?	0·06	?	?	Bhamo.	
...	...	...	...	...	...	..	...	...	...	...	...	...	...	...	...	...	...	1·67	1·23	+0·44	...	...	...	**Assam.**	
24	...	...	2	2	...	...	...	...	1	3	−67	86	·446	3·4	4	...	...	1·40	1·77	−0·37	1·40	2·48	−1·08	Silchar .	ASSAM (SURMA).
1	...	9	2	3	1	8	1	3	2	2	00	99	·447	5·5	3	...	...	1·82	1·59	+0·23	2·28	3·04	−0·76	Sibsagar .	BRAHMAPUTRA.
3	3	6	4	2	1	8	...	1	5	4	+25	84	·404	2·0	3	...	...	1·79	0·34	+1·45	2·01	0·63	+1·38	Dhubri.	
...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2·19	0·95	+1·24	...	...	...	**Bengal and Orissa.**	
...	8	16	2	...	...	...	...	2	2	4	−50	79	·460	3·1	0	...	...	0·11	0·97	−0·86	0·11	1·49	−1·38	Chittagong	EAST BENGAL.
			Not	recorded.					?	?	?	70	·342	0	4	...	...	0·58	?	?	0·58	?	?	Lungleh.	
8	7	2	6	2	...	...	2	1	4	?	?	79	?	0·5	3	...	...	3·09	?	?	3·09	?	?	Noakholly.	
1	6	...	8	2	9	..	2	...	2	?	?	82	?	2·4	4	...	...	2·66	?	?	2·66	?	?	Comillah.	
...	2	...	3	1	1	9	8	4	2	?	?	81	?	2·0	3	...	...	2·34	?	?	2·51	?	?	Serajgunj.	
11	5	2	2	1	3	2	...	2	4	3	+33	79	·446	2·3	3	...	...	3·72	1·29	+2·43	3·72	1·57	+2·15	Dacca.	
18	2	5	...	...	...	...	...	3	3	?	?	80	·490	1·9	4	...	...	4·82	1·08	+3·74	4·82	1·88	+2·94	Burrisal.	
5	...	4	6	4	1	2	3	2	3	?	?	80	·426	2·1	3	...	...	4·19	1·00	+3·19	4·24	1·38	+2·86	Mymensingh.	
20	5	...	1	1	...	1	...	...	2	?	?	84	?	2·1	3	...	...	4·28	?	?	4·28	?	?	Furreedpore	DELTAIC BENGAL.
14	2	...	2	3	2	2	...	3	2	2	00	84	·487	2·0	3	...	...	5·58	1·13	+4·45	5·58	1·63	+3·95	Jessore.	
11	3	5	...	1	2	2	3	1	3	4	−25	78	·492	1·8	1	...	...	0·91	1·18	−0·27	0·91	1·68	−0·77	Calcutta.	
1	6	6	2	1	4	2	3	3	10	8	+25	84	·573	3·0	3	...	...	2·54	1·26	+1·28	2·54	1·52	+1·02	Saugor Island.	
1	2	2	3	5	2	3	5	5	4	?	?	70	?	2·4	2	...	...	5·14	?	?	5·24	?	?	Kishnaghur.	
...	16	1	...	3	6	2	...	...	8	?	?	60	?	1·5	2	...	...	0·42	?	?	0·42	?	?	Midnapore.	
10	2	...	...	...	2	...	11	3	3	?	?	64	?	1·9	1	...	...	1·34	?	?	1·40	?	?	Bankoora .	CENTRAL BENGAL.
...	7	2	1	2	...	2	3	11	3	?	?	68	?	1·4	1	...	...	1·78	?	?	3·25	?	?	Raneegunge.	
9	5	1	...	...	4	1	6	2	2	2	00	72	·436	2·9	2	...	...	1·04	0·82	+0·22	1·79	0·96	+0·83	Burdwan.	

Table

Abstract of observations taken at 8 A.M. at 155 stations

Meteorological Province or District.	Station.	Height of station 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.
Central Bengal	Nya Doomka	490	29·542	?	30·015	29·722	11th	29·367	4th	·355	62·3	78·9	?	54·9	?	66·9	?	24·0	87·1	4th	43·0	7th	44·1
	Berhampore	66·45	29·987	+·021	30·006	30·160	11th	29·788	4th	·372	60·6	79·1	−3·1	56·1	+0·3	67·6	−1·4	23·0	86·6	4th	45·6	6th	41·0
	Rampore Bauleah.	70	29·979	?	30·002	30·153	11th	29·768	4th	·385	61·6	76·7	?	55·2	?	66·0	?	21·5	84·0	4th	44·7	8th	39·3
	Maldah	80	29·975	?	30·011	30·160	11th	29·752	4th	·408	61·6	78·1	?	52·9	?	65·5	?	25·2	83·3	4th	42·5	7th	40·8
	Bogra	61·48	29·979	+·045	29·996	30·140	11th	29·762	4th	·378	61·0	78·1	−0·9	53·9	+2·5	66·0	+0·8	24·2	83·3	22nd	43·5	6th	39·8
North Bengal	Dinagepore	117·59	29·927	+·018	30·005	30·107	11th	29·680	4th	·427	58·5	77·7	−0·6	52·5	+3·0	65·2	+1·2	25·2	82·1	4th	44·5	6th	37·6
	Rungpore	123	29·937	?	30·021	30·116	11th	29·686	4th	·430	57·7	76·5	?	51·4	?	64·0	?	25·1	81·0	22nd	42·9	6th	38·1
	Julpaiguri	283·70	29·747	+·022	30·001	29·927	11th	29·486	4th	·441	55·8	75·5	+0·2	49·3	−1·0	62·4	−0·4	26·2	78·9	4th	42·6	6th	36·3
Orissa	Balasore	56·15	30·001	+·027	30·005	30·160	11th	29·835	4th	·325	66·2	83·3	+0·3	60·5	+0·8	71·9	+0·6	22·8	89·4	3 dates	49·4	7th & 8th	40·0
	False Point	20·60	30·020	+·007	29·983	30·161	11th	29·849	4th	·312	69·7	80·5	−2·2	62·5	−1·9	71·5	−2·1	18·0	84·4	5th, 20th & 23rd	50·5	8th	33·9
	Cuttack	80	29·977	+·033	30·002	30·122	11th	29·805	4th	·317	69·2	88·2	−2·0	64·7	−0·4	76·5	−1·2	23·5	92·9	28th	55·4	1st	37·5
	Shortt's Island	?	30·036	?	?	30·160	11th	29·863	4th	·297	72·8	78·3	?	69·4	?	73·9	?	8·9	83·2	20th & 22nd	65·3	9th	17·9
	Pooree	11·99	30·032	?	29·985	30·170	11th	29·880	4th	·290	70·9	82·2	?	66·9	?	74·6	?	15·3	88·2	2nd	57·6	7th	30·6
Gangetic Plain and Chutia Nagpur.		...	...	+·032	...	...	...		...	...	...	76·6	−2·7	51·	−1·1	64·2	−1·9	24·8	...	...	...	...	44·0
Chutia Nagpur	Hazaribagh	2,007·12	27·992	+·023	30·023	28·157	11th	27·863	4th	·294	59·8	76·2	−1·6	53·3	−0·6	64·8	−1·1	22·9	84·7	28th	39·9	6th	44·8
	Ranchee	2,128·14	27·859	?	30·008	28·009	11th	27·721	4th	·288	59·7	76·3	?	52·4	?	64·4	?	23·9	85·0	28th	40·9	7th	41·1
	Chybassa	760	29·270	?	30·011	29·425	11th	29·109	4th	·316	62·8	83·6	?	57·1	?	70·4	?	26·5	90·5	4th	45·5	7th	45·0
Behar, South	Gya	37·45	29·685	+·039	30·035	29·875	11th	29·500	3rd	·375	60·0	78·1	−3·6	54·9	−0·9	66·5	−2·3	23·2	90·0	22nd	45·0	7th	45·0
	Dehree	351·14	29·704	?	30·029	29·894	11th	29·517	3rd	·377	61·4	77·6	?	55·4	?	66·5	?	22·2	8 7·8	22nd	45·0	7th	42·8
	Patna	182·84	29·875	+·026	30·020	30·060	11th	29·715	3rd	·345	59·3	75·6	−2·6	52·4	+0·1	64·0	−1·3	23·2	82·3	22nd	41·3	7th	41·0
	Arrah	190·02	29·855	?	30·009	30·044	11th	29·695	3rd	·349	57·1	76·4	?	51·5	?	64·0	?	24·9	87·1	28th	40·4	7th	46·7
	Buxar	239·22	29·811	?	30·021	30·003	11th	29·631	3rd	·372	57·8	76·2	?	52·4	?	64·3	?	23·8	84·4	22nd	40·5	7th	43·9
Behar, North	Purneah	125	29·920	+·028	30·008	30·098	11th	29·691	4th	·407	54·5	75·4	−3·7	49·4	−1·3	62·4	−2·5	26·0	81·7	22nd	34·7	7th & 8th.	47·0
	Bhagalpur	159·78	29·879	?	30·000	30·071	11th	29·683	4th	·388	59·3	76·8	?	53·9	?	65·4	?	22·9	83·7	22nd	42·5	7th	41·2
	Durbhunga	166·32	29·886	+·030	30·016	30·077	11th	29·682	4th	·395	57·4	75·0	−1·2	52·1	−1·4	63·6	−1·3	22·9	80·2	22nd	43·7	6th	36·5
	Mozufferpore	178·42	29·857	?	30·000	30·018	11th	29·678	4th	·340	55·9	74·5	?	51·1	?	62·8	?	23·4	80·4	22nd	42·3	7th	38·1
	Motiharee	223·61	29·809	?	30·005	29·989	11th	29·628	4th	·361	55·5	74·8	?	48·6	?	61·7	?	26·2	79·2	4th	38·0	9th	41·2
	Chupra	181·30	29·855	?	30·013	30·033	11th	29·702	4th	·331	56·8	76·3	?	51·8	?	64·1	?	24·5	86·3	19th	42·1	7th	44·2
N.-W. Provinces (Eastern Districts).	Benares	266·99	29·791	+·033	30·032	29·987	12th	29·594	21st	·393	56·0	77·0	−3·8	49·7	−1·7	63·4	−2·8	27·3	86·2	28th	38·9	7th	47·3
	Allahabad	309·28	29·750	+·029	30·035	29·946	11th & 12th.	29·532	21st	·414	56·7	78·1	−1·7	48·9	−2·0	63·5	−1·9	29·2	88·5	28th	37·5	7th	51·0
N.-W. Provinces (Eastern Submontane).	Gorakhpur	255·93	29·788	+·038	30·020	29·977	11th	29·634	3rd	·343	57·8	74·6	−3·9	51·0	−0·7	62·8	−2·3	23·6	79·5	4 dates	41·3	7th	38·2
Oudh, South	Lucknow	369·40	29·686	+·038	30·041	29·902	11th	29·474	21st	·428	55·4	76·6	−2·1	48·6	−1·4	62·6	−1·8	28·0	86·3	28th	36·9	8th	49·4
(N.-W. Provinces, Central).	Cawnpore	415·57	29·631	?	30·030	29·850	11th	29·389	21st	·461	56·5	76·0	?	49·6	?	62·8	?	26·4	86·0	28th	37·7	9th	48·3
Upper—Sub-Himalayas		...	...	+·032	...	...	...	...	...	..	...	66·6	−5·4	44·7	−1·6	55·7	−3·6	22·0	...	...	...	...	38·9
N.-W. Provinces, (Submontane).	Bareilly	568·47	29·456	+·036	30·034	29·689	11th	29·209	21st	·480	50·8	72·8	−2·4	47·3	−1·4	60·0	−1·9	25·5	80·7	23rd	37·0	7th	43·7
	Dehra Dun	2232·40	27·738	?	30·061	27·958	11th	27·513	21st	·445	47·5	66·7	?	43·6	?	55·2	?	23·1	74·5	18th	35·5	9th & 10th	39·0
	Roorkee	886·63	29·124	+·032	30·053	29·370	11th	28·864	21st	·506	48·2	69·4	−4·1	44·9	−2·2	57·2	−3·2	24·5	75·8	3 dates	33·8	7th	42·0
	Meerut	737·48	29·294	+·039	30·055	29·557	11th	29·011	21st	·546	50·7	71·0	−3·8	45·9	−1·5	58·5	−2·7	25·1	78·2	22nd	35·5	8th & 10th	42·7
Punjab (Central).	Delhi	717·81	29·334	+·047	30·067	29·581	11th	29·057	21st	·524	53·6	71·4	−4·2	49·6	−2·1	60·5	−3·2	21·8	78·1	23rd	42·1	3 dates	36·0
	Lahore	702·22	29·325	+·021	30·059	29·618	11th	28·817	2nd	.801	48·0	64·6	−6·5	43·4	−1·8	54·0	−4·2	21·2	73·3	21st	33·2	9th & 10th	40·1

I.

in India, Burma, &c., in February 1891—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.	Normal rainfall for period, 1st January to 28th February.	Variation from normal of period.	Station.	Meteorological Province or District.
4	3	1	3	1	...	1	...	15	2	?	?	63	?	1·1	2	...	...	0·70	?	?	2·07	?	?	Nya Doomka	Central Bengal.
...	4	3	...	...	1	3	7	10	3	2	+50	81	·442	2·7	2	...	...	1·43	1·11	+0·32	2·14	1·45	+0·69	Berhampore.	
...	6	2	1	5	1	4	6	3	2	?	?	75	?	1·6	2	...	...	0·90	?	?	1·47	?	?	Rampore-Bauleah.	
...	...	2	1	1	...	...	2	21	4	?	?	72	?	1·3	2	...	...	1·55	?	?	2·63	?	?	Maldah.	
14	1	3	2	1	...	2	3	2	3	?	?	73	·396	1·7	2	...	...	4·84	0·78	+4·06	5·22	1·34	+3·88	Bogra.	
...	...	2	3	...	2	11	7	3	3	?	?	78	·389	1·5	1	...	...	1·08	0·50	+0·58	1·51	0·93	+0·58	Dinagepore	North Bengal.
...	6	...	10	...	3	...	8	1	2	?	?	84	?	0·6	3	...	...	1·52	?	?	1·87	?	?	Rungpore.	
				Not recorded.					3	?	?	86	·386	0·7	2	...	...	1·07	0·32	+0·75	1·22	0·81	+0·41	Jalpaiguri.	
4	13	2	...	...	2	2	...	5	4	?	?	72	·481	0·8	3	...	...	1·43	1·35	+0·08	1·43	1·83	−0·40	Balasore	Orissa.
1	10	2	1	...	1	5	2	6	9	8	+13	83	·610	2·8	3	...	...	2·21	0·84	+1·37	2·21	1·42	+0·79	False Point	
13	...	7	1	1	...	6	...	...	2	2	00	70	·512	2·3	1	...	...	0·40	0·59	−0·19	0·45	0·73	−0·28	Cuttack.	
...	6	8	2	...	2	3	4	3	11	?	?	76	·621	2·0	3	...	...	3·73	?	?	3·73		?	Shortt's Island.	
3	7	9	1	...	...	5	1	2	11	?	?	77	?	1·5	1	...	...	0·36	?	?	0·36	?	?	Pooree.	
...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·54	0·33	+0·21	...	...	...	**Gangetic Plain and Chutia Nagpur.**	
...	2	3	1	...	3	6	7	6	9	7	+29	52	·273	1·8	0	...	...	0·06	0·53	−0·47	0·99	1·18	−0·19	Hazaribagh.	Chutia Nagpur.
10	4	...	...	...	1	3	7	3	5	?	?	57	?	2·6	2	...	...	0·45	?	?	1·60	?	?	Ranchee.	
8	2	2	3	...	...	4	7	2	1	?	?	70	?	3·0	3	...	...	0·78	?	?	0·78	?	?	Chybassa.	
...	2	...	3	1	9	5	7	1	5	3	+67	64	·341	2·3	1	...	...	0·42	0·31	+0·11	2·18	0·93	+1·25	Gya	Behar, South.
7	...	...	1	1	1	8	9	1	3	?	?	58	?	1·8	1	...	...	0·30	?	?	1·72	?	?	Dehree.	
3	...	1	4	1	...	5	14	...	4	3	+33	68	·351	1·8	1	...	...	0·26	0·37	−0·11	2·50	0·84	+1·66	Patna.	
...	1	4	3	2	1	11	4	2	2	?	?	75	?	2·0	1	...	...	0·21	?	?	2·08	?	?	Arrah.	
...	...	3	2	...	...	3	13	7	5	?	?	64	?	2·3	1	...	...	0·12	?	?	1·19	?	?	Buxar.	
10	1	1	3	1	1	7	4	...	3	2	+50	85	·368	1·1	3	...	...	2·46	0·57	+1·89	3·02	0·96	+2·06	Purneah	Behar, North.
17	...	...	2	1	...	...	6	2	2	?	?	70	?	1·5	2	...	...	1·21	?	?	2·13	?	?	Bhagalpur.	
3	1	1	3	1	...	6	10	3	5	4	+25	75	·363	1·0	2	...	...	0·94	0·50	+0·44	2·01	0·89	+1·12	Durbhunga.	
7	1	1	6	...	...	3	9	1	5	?	?	94	?	1·3	1	...	...	0·25	?	?	1·80	?	?	Mozufferpore	
	1	3	3	2	...	4	11	4	7	?	?	82	?	2·4	1	...	...	0·87	?	?	2·02	?	?	Motiharee.	
4	...	...	4	2	1	1	15	1	4	?	?	81	?	1·5	1	...	...	0·22	?	?	1·64	?	?	Chupra.	
10	1	2	1	1	2	8	2	1	4	4	00	77	·352	2·2	1	...	...	0·23	0·20	+0·03	1·78	0·96	+0·82	Benares	N.-W. Provinces (Eastern Districts).
3	3	3	2	2	...	3	7	5	4	3	+33	69	·329	2·1	1	...	...	0·28	0·12	+0·16	1·60	1·01	+0·59	Allahabad.	
...	1	1	2	1	...	...	19	4	2	2	00	66	·329	1·4	1	...	...	0·46	0·23	+0·23	1·85	0·86	+0·99	Gorakhpur	N.-W. Provinces (Eastern Submontane).
7	1	1	...	2	...	3	6	8	4	3	+33	66	·301	2·1	1	...	..	0·15	0·07	+0·08	1·46	1·26	+0·20	Lucknow	Oudh, South.
...	5	3	1	5	1	4	6	3	5	?	?	66	·308	1·4	1	...	...	0·47	0·41	+0·06	1·14	?	?	Cawnpore	N.-W. Provinces (Central).
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1·33	1·04	+0·29	...	...	...	**Upper Sub-Himalayas.**	
14	...	...	...	3	...	1	2	8	3	4	−25	75	·287	2·0	1	...	...	0·10	0·36	−0·26	2·01	1·54	+0·47	Bareilly	N.-W. Provinces (Submontane).
25	...	1	...	...	1	...	1	...	1	2	−50	77	·260	4·4	5	...	...	2·37	1·82	+0·55	5·41	?	?	Dehra Dun.	
10	...	2	1	2	...	...	10	3	4	3	+33	80	·274	2·7	2	...	...	0·48	0·93	−0·45	2·05	3·02	−0·97	Roorkee.	
6	...	1	...	4	...	...	14	3	3	3	00	67	·256	3·6	1	...	...	0·20	0·59	−0·39	1·51	2·04	−0·53	Meerut.	
1	3	...	1	4	...	2	11	6	5	4	+25	63	·265	3·5	1	...	...	0·14	0·41	−0·27	1·34	1·77	−0·43	Delhi	Punjab (Central).
16	2	2	1	3	1	...	2	1	2	2	00	82	·278	5·0	3	...	...	0·47	0·90	−0·43	3·69	1·83	+1·86	Lahore.	

Table

Abstract of observations taken at 8 A.M. at 155 stations

Meteorological Province or District.	Station.	Height of Station in feet.	Pressure, 8 A.M., in inches. 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.	Temperature of Air. 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 recorded during month.	Date.	Lowest temperature during month.	Date.	Absolute range during month.
Punjab, (Submontane).	Ludhiana	811·86	29·195	+·020	30·041	29·467	11th	28·811	2nd	·656	49·5	64·9	−7·0	45·9	−0·2	55·4	−3·6	19·0	72·7	24th	34·8	9th	37·9
Punjab (North).	Sialkot	829·47	29·176	+·025	30·049	29·466	11th	28·667	2nd	·799	47·7	62·6	−7·1	42·9	−2·2	52·8	−4·7	19·7	70·0	24th	35·2	9th	34·8
	Rawalpindi	1648·90	28·355	+·039	30·084	28·641	11th	27·779	2nd	·862	42·6	56·5	−8·2	38·8	−1·7	47·7	−5·0	17·7	64·6	17th	30·9	8th & 11th	33·7
Indus Valley and North-West Rajputana.		...	...	+·032	...	...	...	...	...	...	...	69·5	−5·5	4 ·1	−1·0	58·8	−3·3	21·5	...	...	...	...	41·4
Punjab, West	Peshawar	1110·40	28·970	+·038	30·113	29·282	11th	28·421	2nd	·861	43·1	57·7	−8·2	39·2	−2·2	48·5	−5·2	18·5	66·2	17th	29·9	8th	36·3
	Khushab	611·51	29·428	?	30·065	29·728	11th	28·913	2nd	·816	47·1	62·3	?	46·9	?	54·6	?	15·4	71·0	2 nd	36·6	6th	34·4
	Montgomery	558·46	29·494	?	30·068	29·784	11th	28·999	2nd	·785	49·3	66·4	?	43·9	?	55·2	?	22·5	75·3	21st & 23rd	32·8	9th	42·5
	D. I. Khan	572·56	29·493	+·028	30·091	29·845	11th	28·937	2nd	·908	46·9	63·8	−8·1	43·0	−1·1	53·4	−4·6	20·8	72·7	21st	32·0	9th & 10th	40·7
	Mooltan	420·19	29·663	+·039	30·085	29·952	12th	29·172	2nd	·780	49·5	67·3	−5·9	46·0	+0·2	56·6	−2·9	21·3	74·3	3 dates	36·2	8th & 9th	38·1
	Sirsa	661·61	29·373	+·024	30·055	29·649	11th	28·963	2nd	·686	49·8	69·8	−5·8	45·5	−0·3	57·6	−3·1	24·3	82·0	21st	34·2	10th	47·8
Sind and Cutch.	Jacobabad	185·90	29·912	+·033	30·077	30·228	12th	29·598	20th	·630	53·8	72·0	−5·2	47·4	−0·1	59·7	−2·7	24·6	84·0	21st	34·0	8th	50·0
	Hyderabad	117·43	29·984	+·032	30·063	30·247	12th	29·714	20th	·533	57·9	76·9	−3·1	50·9	−3·0	63·9	−3·1	26·0	87·2	22nd	43·4	3 dates	43·8
	Kurrachee	49	30·054	+·032	30·057	30·276	12th	29·805	20th	·471	60·7	77·2	−1·9	57·0	−0·5	67·1	−1·2	20·2	84·2	22nd & 25th	47·1	9th	37·1
	Bhuj	394·90	29·661	?	30·028	29·831	12th	29·479	20th	·352	64·0	81·2	?	57·9	?	69·6	?	23·3	92·7	26th	47·1	9th	45·6
Rajputana, West	Bickaneer	743·50	28·985	?	29·734	29·442	28th	28·613	2nd	·829	54·5	70·3	?	50·9	?	60·6	?	19·4	80·1	27th	41·1	10th	39·0
	Pachpadra	380	29·704	?	?	29·910	12th	29·424	2nd	·516	?	?	?	?	?	?	?	?	?	?	?	?	?
East Rajputana, Central India and Guzerat.		...	...	+·030	...	...	...	...	...	..	...	79·6	−1·8	51·2	−1·0	65·6	−1·4	28·7	...	...	...	...	52·2
Rajputana, East	Jeypore	1430·60	28·601	+·019	30·090	28·805	11th	28·312	2nd	·493	55·1	75·7	−2·3	47·6	−2·3	61·7	−2·3	28·1	88·1	28th	36·2	7th	51·9
	Sambhar	1253·52	28·761	+·014	30·061	28·968	11th	28·462	2nd	·506	52·4	73·6	−2·9	46·2	−1·7	59·9	−2·3	27·4	86·4	27th	33·0	10th	53·4
	Ajmere	1611	28·434	+·035	30·103	28·641	12th	28·130	2nd	·511	53·9	74·5	−3·0	48·8	+0·8	61·7	−1·1	25·7	87·0	27th & 28th	35·0	6th	52·0
	Deesa	465·5	29·595	+·035	30·044	29·759	12th	29·396	2nd	·363	60·2	85·1	−0·3	53·5	−0·9	69·4	−0·6	31·6	95·8	23th	42·0	9th	53·8
Kattiawar	Rajkot	428·83	29·631	+·029	30·035	29·741	9th	29·502	2nd	·239	62·0	85·8	−1·8	53·3	−0·7	69·6	−1·3	32·5	94·9	3 dates	39·1	7th	55·8
	Verawal	?	30·060	?	30·020	30·175	14th	29·947	1st	·228	67·5	75·2	?	?	?	?	?	?	93·8	19th	?	?	?
	Bhavnagar	?	30·053	?	30·037	30·173	9th	29·916	2nd	·257	62·6	85·3	?	57·2	?	71·3	?	28·1	86·9	21st	46·0	8th	50·9
Central India	Nowgong	757·04	29·296	+·028	30·060	29·505	11th	29·071	21st	·434	56·6	77·3	−3·1	47·9	−2·1	62·6	−2·6	29·4	91·5	28th	37·5	6th & 7th	54·0
	Sutna	1040·10	28·984	+·017	30·045	29·175	12th	28·812	2nd	·363	57·7	77·4	−1·9	49·6	−1·3	63·5	−1·6	27·8	92·1	28th	38·1	7th	54·0
	Indore	1823·20	28·211	+·042	30·068	28·340	12th	28·053	2nd	·287	60·7	81·1	−1·4	50·3	−1·2	65·7	−1·3	30·8	94·0	28th	37·2	9th	56·8
	Neemuch	1630	28·406	+·037	30·077	28·564	12th	28·192	2nd	372	58·5	77·8	−2·7	50·5	−0·8	64·2	−1·8	27·3	91·8	28th	40·0	7th	51·8
Guzerat	Surat	36	30·026	+·027	30·007	30·113	8th	29·929	20th	·184	65·7	89·4	0	57·9	−0·2	73·7	−0·1	31·5	98·2	27th & 28th	50·1	3 dates	48·1
N.-W. P. (West)	Agra	555·44	29·514	+·039	30·072	29·750	11th	29·233	21st	·517	53·8	75·8	−2·7	50·0	−1·6	62·9	−2·2	25·8	86·6	28th	38·7	7th	47·9
	Jhansi	840·13	29·203	+·040	30·052	29·405	11th	28·968	21st	·437	58·9	80·6	+0·3	53·4	−0·5	67·0	−0·1	27·2	92·5	28th	43·9	9th & 10th	48·6
Deccan		..	...	+·025	...	...	...	...	...	...	...	85·5	−2·3	56·2	−1·0	70·9	−1·7	29·4	...	...	...	...	48·2
Bombay, Deccan	Belgaum	2524	27·471	+·007	29·963	27·542	12th	27·370	4th	·172	69·6	88·3	−0·3	60·5	+1·1	74·4	+0·4	27·8	92·3	20th	53·9	6th	38·4
	Sholapur	1589·70	28·434	+·025	30·006	28·532	12th	28·335	4th	·197	70·4	92·6	−1·1	62·3	+0·7	77·5	−0·2	30·3	96·2	28th	53·6	9th	42·6
	Poona	1840·37	28·190	+·034	30·040	28·262	12th	28·104	4th	·158	64·3	91·2	+0·6	55·7	−1·6	73·5	−0·5	35·5	97·2	21st	45·0	8th	52·2
Khandeish	Malegaon	1430·12	28·604	+·031	30·050	28·704	9th	28·489	2nd	·215	62·0	88·1	−1·5	53·3	−1·6	70·7	−1·6	34·8	97·4	28th	38·8	9th	58·6
	Ahmednagar	2151·62	27·874	?	30·034	27·958	18th	27·787	4th	·171	64·6	87·4	?	54·3	?	70·9	?	33·1	94·3	21st	43·9	9th	50·4
Berar	Akola	9·30	29·096	+·027	30·022	29·215	12th	28·977	20th	·238	62·9	87·9	−2·3	55·9	−0·6	71·9	−1·5	32·0	96·9	28th	41·7	9th	55·2
	Amraoti	1215·50	28·804	+·030	30·016	28·912	12th	28·697	20th	·215	66·5	87·9	−1·9	59·8	−0·9	73·9	−1·4	28·1	95·3	28th	49·9	9th	45·4

I —*continued.*

in India, Burma, &c., in February 1891 —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 of 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.	Normal rainfall for period 1st January to 28th February.	Variation from normal of period.	Stations.	Meteorological Province or District.
6	3	1	...	1	2	...	8	7	3	2	+50	79	·288	5·0	3	...	...	0·69	0·94	−0·25	6·59	2·72	+3·87	Ludhiana.	Punjab (Sub-montane).
12	4	1	3	1	...	...	4	3	2	2	00	87	·297	4·1	4	...	...	2·15	1·31	+0·84	8·75	3·11	+5·64	Sialkot	Punjab, North.
13	1	1	...	...	..	2	...	11	2	2	00	91	·254	4·6	8	...	...	5·33	1·79	+3·54	9·84	4·47	+5·37	Rawalpindi.	
...	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...	...	...	0·61	0·40	+0·21	...	...	...	**Indus Valley and N.-W. Rajputana.**	
5	...	1	...	5	6	7	2	2	4	3	+33	77	·221	4·4	6	...	...	2·69	0·93	+1·76	7·10	2·56	+4·54	Peshawar	Punjab, West.
2	9	2	1	1	5	2	3	3	3	?	?	67	·220	4·4	2	...	...	1·23	?	?	2·97	?	?	Khushab.	
4	4	5	3	..	2	2	3	5	5	?	?	77	·281	4·6	3	...	...	0·48	0·60	−0·12	2·01	?	?	Montgomery	
8	4	3	2	...	1	1	3	6	2	2	0	75	·247	4·4	2	...	...	1·68	0·32	+1·36	2·91	0·80	+2·11	D. I. Khan.	
3	1	11	...	5	...	2	...	6	1	2	−50	75	·275	4·9	3	...	...	0·62	0·36	+0·26	1·66	0·75	+0·91	Mooltan.	
7	6	1	1	3	3	...	3	4	5	3	+67	78	·286	4·6	0	...	...	0	0·21	−0·21	2·07	1·13	+0·94	Sirsa.	
11	2	3	3	4	...	1	...	4	3	3	00	55	·241	4·7	2	...	...	0·64	0·31	+0·33	1·04	0·54	+0·50	Jacobabad	Sind and Cutch.
1	1	17	...	...	...	7	...	2	5	7	−29	54	·271	3·0	0	...	...	0	0·26	−0·26	0·90	0·72	+0·18	Hyderabad.	
...	2	15	5	1	...	1	1	3	10	11	−90	62	·354	2·1	0	...	...	0	0·22	−0·22	1·03	0·83	+0·20	Kurrachee.	
...	6	4	2	1	2	3	4	6	8	7	+14	48	·314	1·1	0	...	...	0	?	?	0·52	?	?	Bhuj.	
...	7	4	2	1	1	3	5	5	5	4	+25	53	·229	2·1	0	...	...	0	?	?	0·45	?	?	Bickaneer	Rajputana, West.
3	1	10	1	...	1	3	...	1	?	3	?	?	?	2·3	0	...	...	0	?	?	0·35	?	?	Pachpadra.	
...	...	...	...	...	...	...	...	...	...	...	..	...	...	...	...	...	...	0·02	0·18	−0·16	...	...	...	**East Rajputana, Central India and Guzerat.**	
10	4	4	1	2	...	1	1	5	3	4	−25	52	·234	2·3	0	...	...	0	0·17	−0·17	0·80	0·70	+0·10	Jeypore	Rajputana, East.
8	7	4	...	1	...	1	3	4	5	5	00	51	·215	2·0	0	...	...	0	0·11	−0·11	0·97	0·47	+0·50	Sambhar.	
18	1	3	...	...	1	1	2	2	3	3	00	56	·241	2·1	0	...	...	0	0·27	−0·27	0·97	0·60	+0·37	Ajmere.	
...	2	12	9	1	1	2	1	...	7	9	−22	37	·203	2·9	0	...	...	0	0·16	−0·16	0·59	0·22	+0·37	Deesa.	
10	1	5	4	...	...	2	5	1	7	6	+17	53	·320	0·9	1	...	...	0·18	0·09	+0·09	0·18	0·12	+0·06	Rajkot	Kattiawar.
1	7	12	...	...	2	1	3	2	11	?	?	43	·308	2·0	0	...	...	0	?	?	0	?	?	Veraval.	
...	...	2	...	...	3	10	6	7	10	?	?	72	·427	0·6	0	...	...	0	?	?	0	?	?	Bhavnagar.	
5	6	1	2	1	1	2	8	2	2	2	00	60	·280	1·9	0	...	...	0	0·25	−0·25	0·41	1·02	−0·61	Nowgong	Central India.
5	7	3	2	...	1	...	5	5	5	5	00	57	·275	1·1	0	...	...	0·08	0·35	−0·27	1·12	1·48	−0·36	Sutna.	
9	3	1	3	1	3	1	4	3	2	3	−33	42	·239	1·4	0	...	...	0	0·20	−0·20	0	0·36	−0·36	Indore.	
7	3	7	2	1	...	3	2	3	8	9	−11	45	·240	0·9	0	...	...	0	0·23	−0·23	2·82	0·37	+2·45	Neemuch.	
...	4	3	...	1	1	1	6	12	?	5	?	65	·425	1·1	0	...	...	0	0	0	0	0·07	−0·07	Surat	Guzerat.
1	...	...	...	4	...	3	...	20	5	4	+25	59	·255	1·3	0	...	...	0	0·05	−0·05	0·84	0·66	+0·18	Agra	N.-W. F. (West).
14	2	1	...	...	1	3	...	7	2	3	−33	50	·262	0·9	0	...	...	0	0·29	−0·29	0·44	0·86	−0·42	Jhansi.	
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·38	0·15	+0·23	...	...	...	**Deccan.**	
5	4	4	6	4	...	...	2	3	3	10	−70	48	·354	0·2	0	...	...	0·06	0	+0·06	0·08	0·07	+0·01	Belgaum	Bombay, Deccan.
...	3	3	5	7	4	...	3	3	7	7	00	49	·381	1·2	0	...	...	0·03	0	+0·03	0·05	0·19	−0·14	Sholapur.	
22	...	...	1	2	...	...	1	2	6	6	00	47	·287	0·7	0	...	...	0	0	0	0	0·07	−0·07	Poona.	
6	2	...	...	...	...	3	10	7	5	5	00	48	·275	0·9	0	...	...	0	0·07	−0·07	0	0·39	−0·39	Malegaon	Khandeish.
7	5	3	1	3	...	1	1	7	5	?	?	59	·374	0·4	1	...	...	0·10	0·07	+0·03	0·10	0·63	−0·53	Ahmednagar.	
6	1	4	6	1	1	2	5	2	5	4	+25	51	·310	1·3	2	...	...	0·91	0·06	+0·85	1·77	0·57	+1·20	Akola	Berar.
...	...	7	12	1	...	3	5	...	6	4	+50	44	·289	1·9	1	...	...	0·34	0·08	+0·26	0·56	0·42	+0·14	Amraoti.	

Table

Abstract of observations taken at 8 A.M. at 155

Meteorological Province or District.	Station.	Height of Station 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.
Central Provinces (West).	Khandwa	1043·71	28·989	+·039	30·042	29·109	9th	28·846	2nd	·263	60·9	85·6	−3·0	54·3	−0·6	70·0	−1·8	31·3	97·2	28th	42·0	10th	55·2
	Hoshangabad	1020	29·022	+·020	30·059	29·179	12th	28·874	2nd	·305	57·5	82·0	−3·2	54·1	−0·8	68·1	−2·0	27·9	94·4	28th	44·8	7th	49·6
	Nagpur	1025	29·003	+·032	30·026	29·133	12th	28·874	21st	·259	65·5	85·0	−4·2	58·2	−1·1	71·6	−2·7	26·8	93·2	28th	49·2	7th	44·0
Central Provinces (Central).	Seoni	2030	27·976	+·018	30·032	28·129	12th	27·827	21st	·302	61·9	79·7	−4·3	52·8	−2·4	66·4	−3·4	26·9	88·1	26th & 28th	43·0	10th	45·1
	Jubbulpore	1327·02	28·698	+·030	30·058	28·868	12th	28·531	21st	·337	56·4	78·3	−3·6	49·8	−1·91	64·1	−2·8	28·5	92·0	28th	38·9	6th	53·1
	Saugor	1761·50	28·253	+·024	30·093	28·420	12th	28·081	21st	·339	54·0	74·6	−4·4	48·7	−4·2	61·7	−4·3	25·9	91·3	28th	41·1	6th	50·2
Central Provinces (East).	Raipur	960	29·051	+·022	30·011	29·174	12th	28·931	4th	·243	66·1	84·1	−2·7	59·3	−0·8	71·7	−1·8	24·8	92·5	28th	49·4	6th	43·1
Hyderabad (South).	Secunderabad	1786·69	28·226	+·004	30·004	28·331	12th	28·105	4th	·226	68·9	90·4	−0·5	63·8	+1·3	77·1	+0·4	26·6	96·2	25th	56·6	4th	39·6
West Coast		...	...	+·007	...	...	...	...	...	...	...	87·2	+1·4	70·1	+0·5	78·7	+0·9	17·0	...	...	...	...	29·1
Konkan	Bombay	37	29·999	+·014	29·977	30·062	9th	29·927	20th	·135	70·4	82·0	−0·3	67·0	−1·3	74·5	−0·8	15·0	86·9	16th	58·5	9th	28·4
	Ratnagiri	110	29·898	+·021	29·948	29·954	13th	29·846	4th	·108	74·2	87·9	+1·7	66·4	−0·2	77·2	+0·8	21·5	97·9	20th	58·4	8th	39·5
	Mormugao	?	29·956	?	29·953	30·020	12th & 13th	29·875	4th	·145	76·1	83·6	?	74·9	?	79·2	?	8·7	89·0	26th	67·0	8th	22·0
	Karwar	43·87	29·955	−·006	29·934	30·017	18th	29·877	4th	·140	70·5	89·0	+2·9	67·5	+0·6	78·3	+1·8	21·5	94·8	26th	60·1	1st & 2nd	34·7
Malabar	Mangalore	25·60	29·980	−·003	29·939	30·038	18th	29·910	4th	·128	76·8	89·3	+1·6	72·8	+1·7	81·1	+1·7	16·5	96·8	13th	65·0	2nd	31·8
	Calicut	26·58	29·975	−·002	29·932	30·029	18th	29·907	2nd	·122	78·0	88·6	?	72·9	?	80·7	?	15·7	91·3	28th	65·6	2nd	25·7
	Cochin	11·03	29·995	+·015	29·934	30·061	27th	29·925	2nd	·136	79·4	90·3	+0·9	74·1	+1·5	82·2	+1·2	16·2	93·3	12th	68·3	2nd	25·0
	Trivandrum	?	29·643	?	29·921	29·704	27th	29·564	2nd	·140	78·2	86·6	?	65·5	?	76·1	?	21·1	88·5	28t	62·5	1st	26·0
South India		...	...	+·010	...	...	...	...	...	...	...	88·0	−0·4	68·3	+2·0	78·1	+0·9	19·7	...	...	...	...	32·5
Madras, South	Madura	446·60	29·568	0	29·958	29·644	18th	29·479	4th	·165	76·8	90·7	−1·0	71·1	+2·1	80·9	+0·6	19·6	94·4	25th	64·7	3rd	29·7
Madras, South (Central).	Salem	939·91	29·111	+·006	30·011	29·182	18th	29·023	4th	·159	74·5	92·7	−0·5	68·4	+4·1	80·4	+1·8	24·3	96·3	21st	57·9	1st	38·4
	Coimbatore	1347·64	28·659	−·005	29·979	28·738	18th	28·568	4th	·170	72·2	89·3	−2·6	65·4	+0·6	77·4	−1·0	23·9	96·8	22nd	59·1	6 dates	37·7
Coorg	Mercara	3780·70	26·301	?	29·957	26·368	18th	26·208	4th	·160	65·6	83·3	+2·1	57·5	+0·3	70·4	+1·2	25·8	86·2	4 dates	51·2	4 dates	35·0
Mysore	Bangalore	2981·46	27·069	−·008	30·007	27·153	18th	26·970	4th	·183	65·2	84·7	−0.4	61·4	+2·8	73·1	+1·2	23·3	90·2	21st	52·4	2nd	37·8
Madras, East Coast (South).	Negapatam	15	30·006	−·003	29·950	30·088	18th	29·909	4th	·179	77·7	84·7	+0·5	72·3	+0·9	78·5	+0·7	12·4	86·4	18th & 26th	65·7	3rd	20·7
	Cuddalore	12·44	30·031	?	29·973	30·113	18th	29·929	4th	·184	75·5	85·4	?	70·8	?	78·0	?	14·6	91·2	25th	66·2	4th	25·0
	Trichinopoly	254·78	29·766	−·007	29·959	29·852	18th	29·663	4th	·189	75·7	90·1	−1·8	70·4	+3·0	80·3	+0·6	19·7	94·5	7th	62·4	3rd	32·1
	Madras	22	30·012	−·012	29·968	30·095	18th	29·901	4th	·194	77·2	87·9	+1·4	69·9	+2·3	78·9	+1·9	18·0	90·0	6th & 28th	63·5	1st & 6th	26·5
Madras, East Coast (Central).	Nellore	70·82	29·961	?	29·967	30·061	18th	29·847	4th	·214	75·8	90·1	?	69·0	?	79·4		21·1	96·2	21st	61·1	5th	35·1
	Masulipatam	7·50	30·038	+·008	29·980	30·142	12th & 18th	29·923	4th	·219	75·3	86·6	−0·3	70·4	+2·8	78·5	+1·3	16·2	91·6	26th	60·7	5th	30·9
Madras, Central	Cuddapah	433·36	29·593	?	29·973	29·697	18th	29·484	4th	·213	77·3	93·8	?	70·1	?	81·8	?	23·7	100·7	22nd	57·8	3rd	42·9
	Kurnool	923·45	29·100	?	29·998	29·193	18th	28·989	4th	·204	74·3	93·4	?	64·3	?	78·8	?	29·1	98·5	21st	54·2	1st	44·3
	Bellary	1474·63	28·535	+·026	29·983	28·631	18th	28·425	4th	·206	73·2	92·8	−1·3	65·8	+1·2	79·4	−0·1	27·0	99·5	21st	53·8	4th	45·7
Madras, East Coast (North).	Rajahmundry	112	29·924	?	29·975	30·030	12th	29·802	4th	·228	75·6	91·2	?	69·0	?	80·1	?	22·2	95·0	6th	61·5	3rd	33·5
	Coconada	26	30·022	?	29·983	30·130	12th	29·893	4th	·237	76·2	83·4	?	70·2	?	76·8	?	13·2	88·0	21st	63·7	2nd & 3rd	24·3
	Vizagapatam	31	30·013	+·004	29·986	30·148	12th	29·877	4th	·271	76·1	81·6	−1·2	72·7	+3·0	77·2	+0·9	8·9	84·4	25th	64·9	2nd & 3rd	19·5
	Gopalpur	21·45	30·025	+·045	29·987	30·168	12th	29·866	4th	·302	73·9	81·4	+0·9	69·8	+1·4	75·6	+1·2	11·6	85·2	2nd	60·0	2nd	25·2
Hill Stations		...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Beluchistan	Quetta	5502·26	24·650	+·001	?	24·772	18th	24·395	1st	·377	34·3	45·6	−6·6	31·2	−0·2	38·4	−3·4	14·4	62·5	28th	14·8	2nd	47·7
Northern India.	Murree	6343·86	23·791	−·024	?	23·940	18th	23·310	2nd	·630	32·2	40·5	−7·1	28·1	−6·1	34·3	−6·6	12·4	52·7	20th	18·7	3rd	34·0
	Simla	7274·00	23·008	−·033	?	23·172	12th	22·806	2nd	·366	35·7	44·7	−7·7	32·5	−3·6	38·6	−5·7	12·2	57·2	20th	21·8	9th	35·4

I —*continued.*

Stations in India, Burma, &c., in February 1891 —continued.

Wind Direction. Number of Winds from									Wind Velocity.			Hygrometry 8 A.M.			Rainfall.											
Calm.	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Mean velocity in miles per hour.	Normal.	Percentage of 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 January to 28th February.	Normal rainfall for period 1st January to 28th February.	Variation from normal of period.	Station.	Meteorological Province or District.
5	4	7	...	...	3	1	4	4	4	4	0	46	·257	1·1	0	...	...	0·09	0·04	+0·05	0·09	0·32	−0·23	Khandwa	Central Provinces (West).
8	3	6	6	...	1	2	2	...	4	3	+33	62	·300	2·1	2	...	...	0·50	0·18	+0·32	0·50	0·47	+0·03	Hoshangabad.	
7	9	4	1	...	2	...	...	5	5	4	+25	55	·359	1·8	2	...	...	0·63	0·20	+0·43	1·80	0·63	+1·17	Nagpur.	
1	9	2	2	...	4	2	3	5	3	3	0	62	·354	2·6	5	...	...	1·70	0·69	+1·01	1·85	1·29	+0·56	Seoni	Central Provinces (Central).
12	3	1	...	7	3	1	1	...	2	2	0	72	·336	2·3	2	...	...	0·70	0·30	+0·40	0·70	1·20	−0·50	Jubbulpur.	
				Imperfect					4	3	+33	47	·200	0·3	0	...	...	0·03	0·27	−0·24	0·03	1·03	−1·00	Saugor.	
5	4	6	2	...	2	4	3	2	5	4	+25	54	·355	3·0	2	...	...	0·25	0·31	−0·06	0·67	0·46	+0·21	Raipur	Central Provinces (East).
12	...	1	10	2	1	...	...	2	2	4	−50	73	·517	2·9	2	...	...	0·43	0	+0·43	0·43	0·08	+0·35	Secunderabad	Hyderabad, (South).
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·31	0·12	+0·19	...	...	...	**West coast.**	
...	10	11	4	2	1	...	...	...	11	11	0	62	·480	0·7	0	...	...	0	0	0	0	0·13	−0·13	Bombay	Konkan.
8	3	7	4	5	...	...	...	1	9	12	−25	58	·397	0·1	0	...	...	0	0	0	0	0·37	−0·37	Ratnagiri.	
1	1	3	9	1	1	...	...	8	9	?	?	79	·716	0·3	0	...	...	0	?	?	0	?	?	Mormugao.	
1	...	19	7	...	...	...	...	1	3	?	?	84	·634	0·3	0	...	...	0	0	0	0	0·14	−0·14	Karwar.	
5	7	9	5	1	...	...	...	1	2	4	−50	80	·737	0·8	0	...	...	0·08	0	+0·08	0·08	0·01	+0·07	Mangalore	Malabar.
2	1	10	12	3	...	...	...	...	7	?	?	79	·758	1·2	2	...	...	1·54	0·08	+1·46	1·54	0·31	+1·23	Calicut.	
18	2	2	5	1	...	...	...	...	0	?	?	75	·760	2·0	4	...	...	0·66	0·62	+0·04	0·66	1·14	−0·48	Cochin.	
...	7	8	9	2	...	...	1	1	6	?	?	75	·729	3·5	1	...	...	0·23	?	?	1·31	?	?	Trivandrum.	
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·89	0·19	+0·70	...	...	...	**South India.**	
1	11	11	1	3	1	...	...	...	4	5	−20	75	·730	3·1	3	...	...	0·84	0·27	+0·57	0·84	0·72	+0·12	Madura	Madras, South.
8	1	16	2	...	...	...	...	1	3	6	−50	79	·688	3·2	2	...	...	1·25	0·07	+1·18	1·40	0·55	+0·85	Salem	Madras, South (Central).
...	12	8	5	...	..	...	...	3	3	3	0	84	·673	5·6	4	...	..	1·52	0·14	+1·38	1·95	0·38	+1·57	Coimbatore.	
...	2	4	21	...	...	...	1	...	3	4	−25	70	·444	5·5	0	...	...	0·09	0·11	−0·02	0·09	0·16	−0·07	Mercara	Coorg.
...	1	6	14	3	1	2	1	...	3	4	−25	74	·500	3·3	0	...	...	0	0·14	−0·14	0·21	0·33	−0·12	Bangalore	Mysore.
...	5	6	5	1	...	1	2	8	5	4	+25	79	·754	5·3	3	...	...	1·41	0·65	+0·76	1·71	2·87	−1·16	Negapatam	Madras, East Coast (South).
...	7	1	2	2	2	1	3	10	4	?	?	86	·769	2·0	3	...	...	1·85	0·26	+1·59	3·29	?	?	Cuddalore.	
5	6	13	2	1	...	...	...	1	5	4	+25	81	·716	3·9	4	...	...	6·94	0	+6·94	6·94	2·85	+4·09	Trichinopoly.	
5	5	2	5	1	3	3	...	4	6	5	+20	80	·757	4·1	1	...	...	0·62	0·27	+0·35	0·62	1·87	−1·25	Madras.	
3	3	...	3	4	...	1	5	9	6	?	?	84	·752	4·6	2	...	...	0·52	0·09	+0·43	1·40	?	?	Nellore	Madras, East Coast (Central).
4	8	5	1	2	6	...	1	1	4	5	−20	84	·737	3·0	0	...	...	0	0·15	−0·15	0	0·39	−0·39	Musulipatam.	
...	...	7	6	14	1	...	...	...	?	?	?	71	·667	0·6	2	...	...	0·45	0	+0·45	0·45	0·03	+0·42	Cuddapah.	Madras (Central).
28	...	...	...	...	...	...	...	...	?	?	?	62	·525	0·6	0	...	...	0	0	0	0	0·11	−0·11	Kurnool.	
18	...	...	...	6	1	...	...	3	4	4	0	67	·550	0·8	0	...	...	0	0·07	−0·07	0	0·21	−0·21	Bellary.	
10	5	8	4	...	...	...	...	1	?	?	?	73	·665	2·9	0	...	...	0	0·25	−0·25	0	?	?	Rajahmundry	Madras, East Coast (North).
2	10	7	...	1	1	...	1	6	8	?	?	71	·639	1·9	0	..	...	0	0·22	−0·22	0	?	?	Cocanada.	
...	2	2	...	1	...	...	15	8	2	2	0	72	·652	2·2	0	...	...	0·09	0·09	0	0·09	0·30	−0·21	Vizagapatam.	
1	11	1	...	...	1	2	1	11	10	?	?	75	·607	0·5	1	...	...	0·50	0·65	−0·15	0·50	0·87	−0·37	Gopalpur.	
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	**Hill stations.**	
21	...	...	...	...	2	3	2	...	2	4	−50	83	·174	5·4	12	...	...	5·15	1·65	+3·50	8·90	3·61	+5·29	Quetta	Beluchistan.
4	...	3	8	13	...	...	..	...	11	8	+38	80	·143	5·8	16	...	...	12·92	2·59	+10·33	20·06	5·21	+14·85	Murree	Northern India.
3	...	3	3	8	5	4	1	1	?	2	?	62	·132	5·0	7	...	...	4·98	2·27	+2·71	8·80	4·77	+4·03	Simla.	

Table

Abstract of observations taken at 8 A.M. at 155

Meteorological Province or District.	Station.	Height of Station 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, 4° 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.
Northern India —*contd.*	Mussoorie	?	23·555	?	?	23·710	27th	23·388	3rd	·322	38·4	47·5	?	31·8	?	39·7	?	15·7	59·2	19th	21·0	9th	38·2
	Ranikhet	6068 75	24·110	+·019	?	24·265	12th	23·951	21st	·314	42·5	52·7	−3·2	38·1	−2·6	45·4	−2·9	14·6	62·7	19th	29·0	8th & 9th	33·7
	Darjeeling	7421·10	22·954	+·021	?	23·101	11th	22·788	4th	·313	39·8	46·5	+0·7	33·7	−0·1	40·1	+0·3	12·8	51·8	4th	29·3	7th	22·5
Central India	Mount Abu	3945·00	26·145	+·039	?	26·269	12th	25·957	2nd	·312	56·6	64·1	−5·3	50·6	−2·7	57·4	−4·0	13·5	76·1	28th	38·1	9th	38·0
	Pachmarhi	3511·00	26·574	+·037	?	26·693	12th	26·450	21st	·243	61·9	72·4	−2·7	49·4	−1·2	60·9	−2·0	23·0	82·7	28th	36·3	6th	46·4
Southern India	Wellington	6200·00	24·322	+·028	?	24·397	18th	24·226	4th	·171	57·2	68·4	−2·0	49·1	+2·6	58 8	+0·3	19·3	73·7	25th	35·7	2nd	38·0
Extra India.																							
Persia	Meshed	?					Not recorded.				25·1	40·1	?	21·0	?	30·6	?	19·1	54·5	23rd	1·0	3rd	53·5
	Bushire	14	30·075	?	30·046	30·304	7th	29·750	18th	·554	59·3	66·1	?	55·0	?	60·6	?	11·1	78·8	17th	42·6	2nd	36·2
Turkish Arabia	Baghdad	?	29·643	?	?	29·661	3 dates.	29·609	28th	·052	60·7	64·5	?	39·9	?	52·2	?	24·6	67·5	15th	37·0	3rd	30·5
Arabia	Aden	94·10	29·958	?	29·985	30·070	8th	29·870	27th	·200	77·6	82·7	?	73·4	?	78·1	?	9·3	89·1	28th	70·1	13th & 16th.	19·0
Arabian Sea Islands.	Minicoy	?	30·003	?	29·938	30·058	24th & 26th	29·925	2nd	·133	80·3	86·8	?	79·9	?	83·2	?	6·9	89·7	15th	76·4	27th	13·3

I —*concluded.*

stations in India, Burma, &c., in February 1891 —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 of 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.	Normal rainfall for period 1st January to 28th February.	Variation from normal of period.	Station.	Meteorological Province or District.
...	6	2	6	6	4	1	...	3	?	?	?	73	·172	4·6	6	...	...	3·44	2·80	+0·64	8·09	?	?	Mussoorie	Northern India —*contd.*
14	...	2	9	...	...	3	...	...	5	2	+150	67	·185	4·2	5	...	...	2·41	1·47	+0·94	6·16	3·90	+2·26	Ranikhet.	
14	...	3	4	1	...	4	2	...	6	5	+20	77	·184	3·5	4	...	...	0·74	0·91	−0·17	1·41	1·22	+0·19	Darjeeling.	
7	6	5	...	...	...	3	3	4	7	6	+17	35	·166	2·5	0	...	...	0	0·36	−0·36	1·14	0·69	+0·45	Mount Abu	Central India.
3	1	2	7	2	5	3	4	1	5	4	+25	44	·248	2·4	5	...	...	1·77	0·25	+1·52	1·77	0·77	+1·00	Pachmarhi.	
18	2	3	1	1	2	1	...	...	2	3	−33	75	·358	3·8	8	...	...	6·85	0·15	+6·70	10·20	1·19	+9·01	Wellington.	Southern India.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	**Extra India.**	
3	3	...	4	3	...	2	4	9	?	?	?	?	?	5·2	3	...	...	1·03	?	?	1·14	?	?	Meshed.	Persia.
...	7	8	1	9	1	...	...	2	8	?	?	72	·369	?	2	...	...	0·34	?	?	8·30	?	?	Bushire.	
...	16	2	2	2	2	...	2	2	6	?	?	72	·383	4·4	3	...	...	2·12	?	?	3·74	?	?	Baghdad.	Turkish Arabia.
1	...	5	18	3	1	...	...	...	11	14	−21	70	·655	5·2	0	...	...	0	?	?	0	?	?	Aden.	Arabia.
...	...	Imperfect		...	...	...	...	...	...	...	...	81	·835	3·0	1	...	...	0·28	?	?	0·28	?	?	Minicoy.	Arabian Sea Islands.

Table

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

Station.	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 to 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.
Murree	23·817	23·796	·021	23·800	−·030	?	40·4	27·7	12·7	52·7	18·5	34·2	35·7	35·4	32·2	−7·1	25·9	32·3	32·6	30·3
Chamba	27·028	26·955	·074	26·997	+·012	?	55·4	40·2	15·2	70·3	32·4	37·9	47·1	51·9	45·6	−3·9	38·1	42·6	45·1	41·9
Kailang	20·717	20·660	·057	20·695	−·040	?	30·5	11·8	18·6	46·2	−3·6	49·8	22·7	26·1	18·7	−1·1	11·2	19·8	22·2	17·7
Simla	23·048	22·995	·053	23·017	−·025	?	44·4	32·2	12·2	57·2	21·8	35·4	39·5	40·6	36·8	−4·5	29·2	33·5	36·2	32·0
Peshawar	28·998	28·917	·081	28·948	+·040	30·121	57·8	39·2	18·7	66·4	30·1	36·3	49·8	56·5	47·6	−4·4	37·3	44·2	47·4	42·9
Lahore	29·353	29·285	·068	29·309	+·024	·030	64·7	43·4	21·4	73·2	33·0	40·2	56·8	63·3	53·1	−3·4	42·5	50·3	52·2	48·3
Ludhiana	·225	·149	·076	·178	+·018	·011	64·6	45·9	18·7	73·5	34·8	38·7	57·2	62·2	54·1	−3·4	44·3	51·1	53·4	49·6
Mooltan	·678	·580	·098	·615	+·030	·031	67·3	45·8	21·5	74·3	36·2	38·1	55·8	65·4	55·5	−2·7	41·7	50·4	57·4	49·8
Jacobabad	·943	·825	·118	·873	+·052	·030	71·4	47·6	23·8	83·8	34·0	49·8	62·6	70·1	58·5	−3·2	43·3	51·3	54·0	49·5
Hyderabad	·991	·901	·089	·938	+·030	·014	76·8	50·9	25·9	86·4	43·4	43·0	65·4	70·9	62·5	−3·6	44·8	53·0	56·5	51·4
Kurrachee	30·076	·971	·105	30·015	+·034	·019	76·9	57·4	19·5	84·2	47·3	36·9	68·7	74·9	66·7	−1·4	50·9	58·3	62·8	57·3
Jeypore	28·632	28·526	·106	28·569	+·027	·018	75·9	47·6	28·3	87·9	36·2	51·7	66·3	73·8	61·2	−1·7	41·7	52·2	55·6	47·5
Ajmere	·460	·358	·103	·405	+·045	·043	74·8	48·7	26·0	87·0	35·0	52·0	64·2	73·2	61·7	+0·2	42·5	52·2	57·1	50·6
Mount Abu	26·171	26·097	·073	26·125	+·015	?	64·7	50·6	14·1	77·1	38·1	39·0	60·5	62·6	57·1	−2·7	41·1	46·5	48·2	45·3
Chakrata	23·308	23·256	·052	23·270	+·043	?	48·8	32·5	16·3	59·5	22·1	37·4	41·0	41·0	38·1	−4·4	29·6	36·5	37·0	34·4
Ranikhet	24·138	24·086	·052	24·100	+·018	?	52·5	38·1	14·4	62·5	29·0	33·5	47·2	49·1	43·9	−3·4	34·3	41·2	43·0	39·5
Pithoragarh	·814	·751	·063	·771	+·041	?	55·7	39·0	16·7	65·8	30·8	35·0	49·4	53·6	46·3	−3·6	35·9	43·6	45·5	41·6
Dehra	27·760	27·694	·066	27·720	+·019	·015	66·6	43·6	23·1	74·5	35·4	39·1	54·2	61·8	53·3	−4·4	42·0	47·7	50·9	46·9
Roorkee	29·156	29·070	·086	29·105	+·045	·011	69·6	44·9	24·7	77·3	33·8	43·5	58·4	66·9	56·0	−4·0	42·6	51·0	53·5	49·0
Meerut	·327	·231	·096	·273	+·041	·019	71·2	45·9	25·3	80·2	35·5	44·7	60·6	68·2	57·3	−3·6	44·1	51·3	53·8	49·8
Agra	·545	·431	·114	·479	+·043	·022	76·1	50·0	26·1	86·6	38·5	48·1	64·0	75·2	62·5	−1·7	44·2	53·0	56·9	51·4
Lucknow	·717	·605	·111	·654	+·039	·001	77·0	48·6	28·4	86·5	36·9	49·6	66·6	74·8	62·6	−2·9	45·5	55·9	58·3	53·2
Allahabad	·784	·659	·125	·713	+·035	29·992	78·2	48·9	29·3	88·3	37·5	50·8	67·1	77·0	62·8	−2·5	47·2	56·4	59·3	54·3
Ghazipur	·879	·753	·125	·808	+·046	·992	78·0	53·0	25·0	86·2	43·5	42·7	68·6	74·8	64·2	+0·9	49·8	58·2	59·7	55·9
Nowgong	·311	·191	·120	·243	+·013	·993	77·7	48·1	29·6	91·5	37·5	54·0	67·6	76·4	62·4	−2·4	45·3	55·1	59·0	53·1
Sutna	·012	28·892	·120	28·944	+·014	·986	77·8	49·6	28·1	92·1	38·1	54·0	69·0	77·2	63·1	−1·2	45·8	54·2	56·7	52·3
Durbhunga	·925	29·802	·123	29·857	+·044	·985	75·4	52·0	23·4	81·5	43·7	37·8	67·0	74·5	63·5	−1·2	50·8	58·5	60·5	56·6
Patna	·900	·779	·121	·834	+·032	·977	76·2	52·4	23·8	84·9	41·3	43·6	67·9	74·2	63·8	−1·2	49·7	58·0	60·3	56·0
Hazaribagh	28·021	27·930	·091	27·972	+·033	·983	76·6	53·3	23·3	84·7	39·9	44·8	68·7	74·1	64·3	−1·2	46·8	54·0	56·2	52·3
Darjeeling	22·976	22·914	·063	22·941	+·008	?	46·2	33·9	12·4	51·8	29·3	22·5	42·1	43·6	39·3	−1·2	31·8	38·5	40·1	36·7
Pedong	25·360	25·264	·099	25·311	+·030	?	58·8	43·2	15·6	64·3	38·0	26·3	54·0	55·2	50·1	+0·6	41·4	49·1	49·4	46·7
Berhampore	30·015	29·889	·126	29·939	+·038	·957	79·4	56·0	23·3	85·6	45·6	40·0	69·4	78·2	66·9	−1·7	54·1	61·0	63·7	59·6
Burdwan	·000	·866	·134	·920	+·040	·969	81·8	57·5	24·3	89·1	45·2	43·9	71·7	79·6	68·6	−1·6	55·4	62·3	64·0	60·6
Calcutta (Alipore)	·070	·940	·130	·994	+·042	·961	80·7	58·4	22·3	87·1	46·2	40·9	72·3	79·0	68·7	−1·1	56·4	62·3	63·1	60·6
Calcutta (Chowringhee)	·074		Not recorded.				81·9	59·7	22·2	88·2	48·9	39·3	73·4	?	70·8	+0·1	57·4	64·7	?	?
Saugor Island	·060	·936	·124	·985	+·036	·955	78·9	62·8	16·1	84·0	49·8	34·2	73·5	76·8	69·8	−2·3	60·1	66·2	67·2	64·5
Daccal	·061	·939	·121	·993	+·039	·963	80·4	57·1	23·3	85·8	48·7	37·1	71·6	78·5	68·6	−1·2	54·0	62·0	64·5	60·2
Chittagong	29·993	·880	·113	·930	+·024	·977	81·5	57·0	24·3	86·4	46·9	39·5	73·0	77·6	68·7	−1·4	55·3	64·3	65·3	61·7
Demagiri			Not recorded.				76·3	56·1	20·2	80·0	47·8	32·2	68·9	75·5	66·0	+0·9	?	?	?	?
Tura							74·5	63·3	11·2	78·4	55·6	22·8	68·0	71·1	68·1	+4·7	?	57·5	59·1	?
Dhubri	29·968	·823	·145	·891	+·021	·967	76·5	54·6	21·9	80·3	47·8	32·5	64·5	75·2	63·8	−0·4	53·0	58·1	60·7	57·3
Sibsagar	·721	·570	·151	·645	−·027	·948	74·7	52·9	21·7	79·0	45·1	33·9	63·3	73·0	62·3	+1·3	52·8	60·5	63·7	59·0

II.

at 85 stations in India, Burma, &c., in February 1891.

Vapour Tension.					Humidity.					Cloud.				Wind Direction. Number of Wind from											Wind Steadiness.		Wind Velocity.		Station.
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 mean.	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.	
·125	·150	·159	·145	−·008	82	75	78	79	+15	5·9	8·3	7·1	+1·5	4	2	7	14	27	2	...	...	...	S 70° E	S 39° E	72	29	234	196	Murree.
·209	·228	·229	·222	−·005	82	70	61	71	+ 6	6·0	9·0	7·5	+2·1	23	5	3	1	3	2	3	2	14	N 39° W	N 55° E	25	8	63	80	Chamba.
·074	·089	·089	·084	?	89	69	62	73	?	7·0	8·7	7·8	+1·5	...	4	1	1	5	2	12	18	13	W	S 69° W	54	64	48	22	Kailang.
·133	·137	·169	·148	−·006	71	55	66	65	+ 9	5·4	8·0	6·7	+1·2	...	..	...	2	10	21	18	3	2	S 12° W	S 22° W	72	28	?	?	Simla.
·205	·226	·221	·217	−·015	83	62	48	64	+ 5	4·8	4·7	4·7	+0·4	8	2	7	6	7	5	1	3	17	N 1° E	N 51° W	15	9	86	78	Peshawar.
·267	·286	·252	·268	−·011	92	60	42	65	+ 8	5·5	5·5	5·5	+2·0	10	11	...	5	5	3	2	9	11	N 42° W	N 25° W	26	30	51	57	Lahore.
·277	·303	·299	·293	−·007	88	63	53	68	+ 5	5·2	5·5	5·3	+1·4	4	9	2	2	4	3	1	17	14	N 57° W	N 48° W	45	39	65	39	Ludhiana.
·216	·300	·371	·296	+·030	69	67	60	65	+12	4·8	4·1	4·4	+1·7	10	...	19	...	5	...	8	1	13	N 5° E	N 5° E	24	18	29	53	Mooltan.
·234	·237	·210	·243	+·018	68	42	29	48	+ 7	4·5	3·9	4·2	+0·9	11	3	8	8	3	4	1	1	17	N 8° E	N 17° E	25	36	76	71	Jacobabad.
·228	·250	·279	·252	−·021	58	38	35	44	+ 2	3·3	3·3	3·3	+1·1	...	1	35	...	1	..	16	...	3	N 37° E	N 25° W	25	41	131	167	Hyderabad.
·302	·367	·426	·361	−·043	60	50	47	53	− 4	2·6	2·0	2·3	−0·7	...	2	19	8	...	...	9	13	5	N 7° W	N 80° W	23	27	244	252	Kurrachee.
·200	·227	·225	·217	−·041	58	34	25	39	− 5	2·3	3·0	2·7	−0·1	1	6	8	2	4	2	7	10	16	N 50° W	N 8° W	37	40	86	105	Jeypore.
·209	·253	·278	·246	−·012	57	41	33	43	− 2	1·7	2·4	2·0	−0·3	8	2	11	1	4	2	5	15	8	N 61° W	S 77° W	26	8	85	63	Ajmere.
·159	·163	·181	·174	+·005	41	31	31	36	+ 4	2·0	1·8	1·9	−0·9	...	15	15	2	1	...	6	10	7	N 13° W	N 71° W	47	24	154	133	Mount Abu.
·140	·173	·184	·166	+·006	76	69	72	72	+ 9	5·4	7·1	6·3	+1·5	1	4	12	8	3	1	13	14	...	N 88° W	S 54° E	8	3	148	126	Chakrata.
·160	·200	·220	·194	+·001	70	62	63	65	+ 5	4·5	6·7	5·6	+1·2	22	...	4	13	...	...	13	4	...	S 23° E	S 55° W	12	24	118	51	Ranikhet.
·179	·222	·217	·206	+·002	74	63	54	64	+ 6	4·4	5·9	5·2	+1·0	29	1	6	...	3	...	17	...	...	S 32° W	S 29° E	19	20	77	62	Pithoragarh.
·255	·256	·244	·252	?	88	61	44	64	?	4·6	6·0	5·3	+1·2	10	1	3	3	4	...	11	15	9	S 87° W	S 85° W	38	19	53	48	Dehra.
·251	·281	·240	·258	−·029	82	57	36	58	− 3	3·4	4·3	3·8	+0·4	8	...	1	4	5	7	...	30	1	S 68° W	N 52° W	43	23	91	68	Roorkee.
·274	·262	·235	·257	−·036	87	48	33	56	− 1	3·5	4·1	3·8	+1·0	7	...	2	1	5	1	7	20	13	N 88° W	N 54° W	50	52	68	64	Meerut.
·224	·266	·231	·240	−·039	60	43	25	43	− 5	1·3	2·2	1·8	−0·6	...	1	4	...	5	1	7	4	34	N 55° W	N 75° W	58	38	110	97	Agra.
·271	·317	·280	·289	−·004	77	47	31	52	+ 1	2·0	3·2	2·6	−0·4	...	4	3	4	6	1	8	15	15	N 74° W	N 58° W	39	44	102	78	Lucknow.
·311	·322	·279	·304	−·027	87	47	29	54	− 2	1·5	2·0	1·8	−0·2	3	2	5	4	7	3	3	14	15	N 67° W	N 66° W	28	25	92	69	Allahabad.
·318	·356	·323	·332	+·060	76	50	36	54	+11	2·0	2·3	2·1	+0·4	7	1	3	7	4	2	8	19	5	S 77° W	S 82° W	30	58	59	56	Ghazipur
·275	·279	·276	·277	0	80	40	30	50	+ 2	1·1	2·0	1·6	−1·7	...	9	4	5	2	...	5	25	6	N 87° W	N 52° W	42	33	41	41	Nowgong.
·289	·247	·215	·243	+·010	74	34	22	43	+3	0·8	1·0	0·9	−1·2	...	8	8	5	1	5	1	9	19	N 30° W	N ° W	42	38	124	116	Sutna.
·362	·384	·349	·365	−·012	91	58	41	63	0	1·5	1·2	1·4	−0·2	1	...	4	8	3	...	11	17	12	N 86° W	S 71° W	36	46	110	87	Durbhunga.
·328	·357	·352	·346	−·008	81	52	42	58	+ 1	2·2	2·1	2·1	−0·4	5	1	1	7	2	1	3	36	...	S 84° W	N 79° W	52	47	95	71	Patna.
·246	·244	·235	·242	−·006	59	34	28	40	− 2	1·5	2·8	2·1	0	...	11	3	2	2	3	6	8	21	N 48° W	N 68° W	52	60	211	156	Hazaribagh
·161	·195	·215	·189	−·020	82	75	76	78	− 1	4·6	5·2	4·9	−0·8	19	...	2	2	1	...	16	6	2	S 58° W	S 83° W	36	33	168	121	Darjeeling.
·242	·294	·288	·277	−·004	87	70	66	75	− 2	4·1	5·5	4·7	−0·4	1	1	1	6	10	23	2	1	...	S 21° E	?	71	?	?	?	Pedong.
·395	·434	·406	·412	+·018	88	60	41	63	−1	2·2	2·4	2·3	0	...	11	4	2	1	2	10	15	11	N 64° W	N 72° W	48	44	59	56	Berhampore.
·425	·450	·394	·423	+·023	88	56	39	61	+5	2·4	2·5	2·5	+0·6	7	16	3	3	2	3	4	11	7	N 38° W	N 58° W	36	43	57	53	Burdwan.
·441	·446	·376	·421	−·066	88	54	38	60	−8	1·9	3·0	2·5	+0·6	...	13	8	3	2	6	7	9	8	N 39° W	S 81° W	27	23	70	86	Calcutta (Alipore).
·454	·510	?	?	?	86	60	?	?	?	...	...	...	Not recorded.														?	?	Calcutta (Chowringhee).
·502	·565	·552	·539	−·085	84	67	60	70	−6	3·4	3·5	3·4	+1·4	..	18	4	...	4	11	6	7	6	N 55° W	S 50° W	22	23	251	189	Saugor Island.
·383	·442	·424	·416	−·030	80	58	44	61	−3	2·2	2·5	2·4	+0·6		8	2	2	3	6	9	14	12	N 82° W	S 76° W	42	35	91	63	Dacca.
·422	·494	·464	·457	−·047	90	60	50	66	−4	2·3	3·0	2·7	+0·9	...	10	13	1	3	2	4	3	20	N 16° W	N 38° W	49	30	58	106	Chittagong.
...	...	Not recorded.			...	...	...	...	...	1·4	1·6	1·5	+0·6	...	...	...	3	11	4	28	10	...	S 31° W	N 55° W	66	32	?	?	Demagiri.
?	·357	·365	?	?	?	53	49	?	?	2·5	2·9	2·7	+0·2	...	...	1	3	9	9	27	7	...	S 25° W	S 12° W	67	66	?	?	Tura.
·385	·404	·341	·376	−·002	89	66	40	65	+1	1·6	2·1	1·9	+0·2	2	1	8	8	7	2	16	8	4	S 22° W	S 22° E	17	13	121	95	Dhubri.
·402	·493	·469	·455	+·010	99	85	58	80	−1	5·0	3·8	4·4	−1·2	...	3	18	5	5	3	16	4	2	S 81° E	N 58° E	8	53	44	52	Sibsagar.

Table

Abstract of observations recorded at 10 A.M. and 4 P.M. at 85 stations

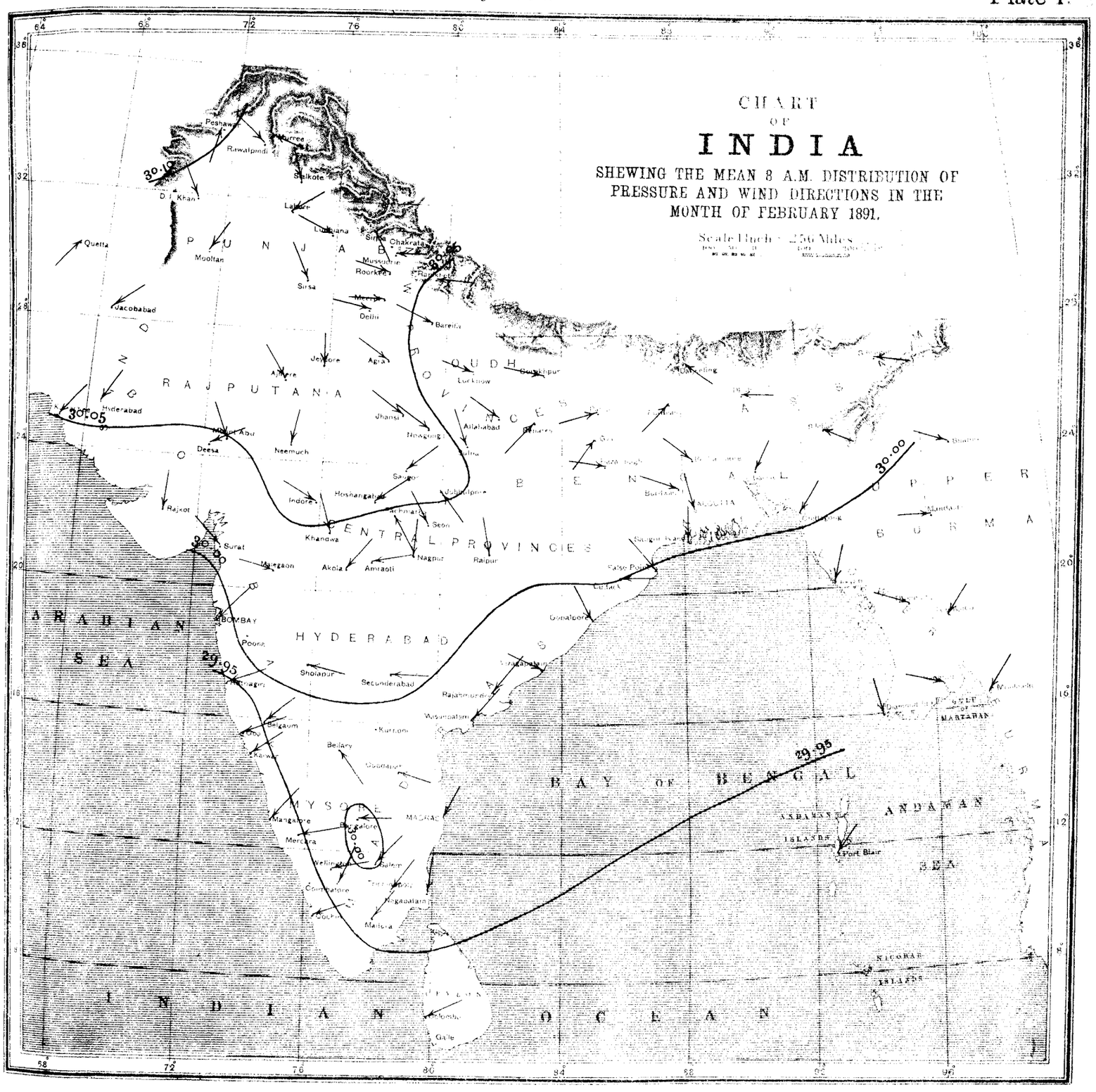
Station.	Pressure.						Temperature of Air.										Temperature, Wet-bulb.			
	Mean of 10 hours.	Mean of 16 hours.	Mean daily range.	Mean daily pressure.	Variation from normal.	Mean reduced to S. L. and to gravity 45° Lat.	Mean maximum.	Mean minimum.	Mean daily range.	Highest maximum.	Lowest minimum.	Absolute range.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	Mean minimum.	Mean 10 hours.	Mean 16 hours.	Mean daily.
Silchar	29·989	29·850	·139	29·916	+·027	29·975	80·5	53·6	27·0	84·4	45·4	39·0	68·5	78·8	66·2	−0·6	52·5	61·8	63·6	59·3
False Point	30·050	·942	·108	·993	+·017	·956	80·8	62·5	18·3	86·8	50·4	36·4	77·7	77·7	70·4	−1·7	61·2	69·9	69·4	66·8
Cuttack	29·997	·866	·131	·932	+·034	·956	88·6	64·7	23·9	97·4	55·4	42·0	78·8	86·5	75·3	−0·1	62·1	66·6	67·9	65·5
Sambalpur	·582	·447	·135	·515	+·030	·936	87·2	60·7	26·5	95·9	49·7	46·2	77·0	84·8	72·9	+0·5	55·5	64·4	65·9	61·9
Raipur	·076	28·948	·136	·011	+·024	·942	84·6	59·3	25·3	96·4	49·6	46·8	75·0	83·1	71·3	−0·4	53·2	61·0	63·4	59·2
Khandwa	·003	·866	·136	28·929	+·031	·955	85·9	54·4	31·5	98·1	42·0	56·1	73·6	84·7	69·7	−2·0	45·6	57·5	61·7	55·0
Hoshangabad	·049	·911	·137	·974	+·023	·983	82·4	54·1	28·3	95·0	44·8	50·2	69·3	81·5	67·8	−2·4	47·8	57·2	63·1	56·0
Saugor	28·272	·154	·118	·207	+·020	?	Imperfect Observations.													
Jubbulpore	·723	·600	·124	·656	+·035	30·000	78·7	49·8	28·9	92·0	38·9	53·1	67·1	77·7	63·8	−2·3	47·8	56·7	60·3	54·9
Pachmarhi	26·598	26·506	·091	26·552	+·031	?	72·7	?	?	83·7	?	?	66·2	69·9	?	?	?	52·3	53·8	?
Nagpur	29·027	28·886	·142	28·951	+·041	29·953	85·4	58·2	27·2	96·8	49·3	47·5	74·0	83·9	71·1	−2·6	51·6	60·7	64·1	58·8
Chanda	·421	29·272	·149	29·341	+·029	·936	88·6	58·0	30·7	97·3	47·1	50·2	76·3	86·2	72·4	−1·8	55·4	63·1	66·3	61·6
Sironcha	·652	·505	·147	·573	−·011	·924	90·2	65·3	25·0	95·8	53·8	42·0	78·5	88·7	77·1	−0·9	61·3	68·5	70·0	66·6
Chikalda	26·452	26·356	·096	26·398	+·006	?	75·0	56·9	18·0	86·2	46·3	39·9	67·1	73·4	65·4	−2·1	48·2	53·8	56·2	52·8
Buldana	27·886	27·769	·117	27·820	+·005	·919	83·9	59·9	24·0	93·4	48·0	45·4	75·5	80·6	70·8	−2·4	50·7	58·1	58·7	55·9
Akola	29·126	28·975	·151	29·044	+·029	·947	88·7	55·8	32·9	98·7	42·1	56·6	75·1	87·7	71·7	−1·1	50·2	59·9	63·6	57·9
Makhla			Not recorded.				80·2	57·7	22·5	92·0	46·8	45·2	68·6	77·0	67·9	−0·7	51·6	58·0	62·5	57·4
Deesa	·611	29·498	·113	·546	+·041	·981	85·3	53·6	31·8	96·3	42·0	54·3	74·5	83·3	69·0	−1·3	46·4	55·5	59·3	53·7
Bombay	30·018	·900	·118	·950	+·026	·928	82·3	66·9	15·4	87·7	58·5	29·2	75·2	78·1	73·9	−1·1	60·1	65·4	69·4	64·9
Poona	28·203	28·059	·144	28·130	+·031	·931	91·5	55·7	35·8	97·3	45·0	52·3	78·8	88·8	73·0	+0·1	49·9	58·7	61·7	56·7
Sholapur	·445	·294	·151	·364	+·014	·903	92·9	62·3	30·6	98·1	53·4	44·7	80·9	91·0	77·8	0	55·6	65·3	68·9	63·3
Ratnagiri	·915	29·800	·115	29·849	+·016	·897	88·3	66·4	21·9	99·4	58·4	41·0	84·0	83·1	76·4	+0·5	60·4	68·7	71·9	66·9
Karwar	·978	·854	·124	·907	0	·883	88·0	69·1	18·8	94·7	61·0	33·7	79·5	85·3	78·2	+1·8	67·0	70·7	75·0	70·9
Belgaum	27·493	·363	·131	27·424	+·007	·875	88·5	60·5	28·0	92·1	53·9	38·2	79·2	86·3	73·4	+0·7	55·2	60·9	62·9	59·7
Secunderabad	28·250	28·114	·136	28·177	+·026	·911	90·4	63·9	26·5	95·2	57·1	38·1	78·9	87·9	77·2	+0·2	60·0	65·9	67·4	64·4
Vizagapatam	30·049	29·924	·126	29·977	+·026	·946	81·9	72·9	9·0	85·5	65·0	20·5	80·3	82·0	78·7	−0·2	67·1	71·0	72·4	70·2
Bellary	28·550	28·397	·153	28·469	+·027	·877	93·0	66·1	26·9	99·4	58·5	40·9	81·7	90·4	79·6	−0·1	59·9	69·8	70·9	66·9
Madras										Not received.										
Salem	29·121	28·984	·137	29·056	+·018	·939	92·6	68·3	24·3	96·5	58·0	38·5	82·3	89·0	78·6	+1·3	66·9	73·1	74·4	71·5
Mercara	26·318	26·216	·102	26·267	+·013	·918	83·4	57·4	26·0	86·1	49·5	36·6	71·1	77·2	68·6	−0·2	55·5	61·8	64·3	60·5
Trichinopoly	29·786	29·639	·147	29·716	+·010	·905	90·2	70·4	19·8	94·6	62·4	32·2	82·0	87·7	78·7	+0·7	68·5	72·6	72·3	71·1
Cochin	30·009	·865	·144	·928	+·011	·866	90·4	74·1	16·3	93·2	68·2	25·0	85·5	86·9	81·7	+1·0	72·4	75·4	76·8	74·9
Wellington	24·340	24·266	·074	24·303	+·027	?	68·5	49·1	19·4	73·7	35·7	38·0	63·6	64·3	59·0	+1·2	47·6	55·7	58·2	53·4
Akyab	30·037	29·920	·117	29·971	+·016	·935	85·3	62·9	22·5	91·2	58·3	32·9	76·4	80·3	73·4	+1·2	56·6	66·8	68·9	64·1
Diamond Island	·005	·896	·108	·946	+·012	·922	85·7	69·9	15·8	89·8	67·1	22·7	80·5	81·5	76·3	−0·3	67·0	72·6	72·4	70·7
Rangoon	29·989	·856	·133	·920	+·006	·897	93·3	67·0	26·3	96·4	59·8	36·6	80·1	87·8	77·1	+1·3	64·1	70·8	71·2	68·7
Mergui	·918	·798	·120	·853	+·003	·880	89·0	68·1	20·9	91·1	65·4	25·7	83·2	86·7	78·0	−1·3	66·5	75·6	76·6	72·9
Cocos Island	·931	·837	·094	·880	?	?	85·0	71·1	13·9	87·9	68·5	19·4	82·3	80·8	76·5	?	69·0	74·3	73·1	71·5
Port Blair	·961	·857	·104	·904	+·015	·896	88·2	76·3	12·0	90·9	72·5	18·4	83·4	85·6	81·1	+1·4	72·6	77·6	78·0	76·1
Quetta	24·676	24·610	·066	24·636	−·002	?	46·7	31·0	15·7	63·8	14·9	48·9	40·0	44·1	38·2	−3·0	31·7	36·4	39·5	35·9
Leh	19·572	19·498	·074	19·541	−·046	?	28·4	7·0	21·4	40·9	−7·8	48·7	19·6	22·9	17·6	−4·3	6·5	17·1	19·9	14·5
Katmandu	25·730	25·618	·112	25·669	+·027	?	71·4	37·6	33·8	78·0	30·2	47·8	50·4	63·6	52·6	0	35·4	45·5	54·5	45·1
Minicoy	30·026	29·925	·100	29·971	?	·868	86·9	80·3	6·7	89·7	13·3	76·4	83·3	84·0	83·2	?	74·7	77·1	77·2	76·3
Aden	29·974	·858	·116	·916	−·004	·943	83·0	73·3	9·7	89·1	70·1	19·0	79·0	79·9	77·4	+0·6	68·6	71·3	70·6	70·2

II —*concluded.*

in India, and Burma, &c., in February 1891 —concluded.

Vapour Tension.					Humidity.					Cloud.				Wind Direction. Number of Winds from											Wind Steadiness.		Wind Velocity.		Station.
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 Mean.	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.	
·389	·466	·390	·415	—·022	93	67	41	67	—3	3·2	3·3	3·3	+0·2	22	...	3	6	7	5	12	1	...	S 12° E	S 33° E	30	25	15	66	Silchar.
·535	·635	615	·595	—·020	93	66	64	74	—5	3·0	3·8	3·4	+0·7	...	7	12	9	5	15	5	1	2	S 71° E	S 12° W	28	16	219	183	False Point.
·534	·502	·440	·492	—·029	85	50	36	57	—5	2·1	2·6	2·4	+0·6	1	6	16	8	3	5	7	4	6	N 41° E	S 16° W	22	13	59	51	Cuttack.
·377	·442	·388	·402	—·059	71	48	34	51	—6	1·8	2·6	2·2	+0·7	...	9	11	7	4	3	10	4	8	N 5° E	N 52° W	17	19	81	44	Sambalpur.
·333	·359	·327	·340	—·010	64	41	29	45	—1	3·1	3·4	3·3	+0·9	1	11	12	1	3	1	9	9	9	N 32° W	N 40° W	34	13	120	92	Raipur.
·206	·282	·268	·253	—·066	46	34	22	34	—8	1·0	1·5	1·2	—0·2	2	8	16	3	...	6	3	6	11	N 5° W	N 8° W	35	32	108	89	Khandwa.
·263	·325	·356	·314	+·005	61	45	34	46	+2	1·8	2·4	2·1	+0·5	4	7	12	12	1	3	10	6	1	N 54° E	N 58° E	16	18	101	66	Hoshangabad.
						Observations					imperfect.																		Saugor.
·316	·339	·315	·323	+·012	86	51	34	57	—1	1·9	2·2	2·1	0	5	9	10	1	5	9	2	9	6	N 26° W	13° W	13	20	47	59	Jubbulpore.
?	·240	·238	?	?	?	38	33	?	?	2·3	2·9	2·6	+0·7	...	1	3	7	4	5	8	16	12	S 84° W	N 49° W	33	24	107	92	Pachmarhi.
·312	·376	·359	·349	+·024	62	44	31	46	+6	1·8	1·9	1·8	—0·1	1	15	12	3	3	6	4	1	11	N 6° E	N 55° E	36	17	118	93	Nagpur.
·415	·409	·386	·403	+·009	85	45	31	53	+4	1·1	2·1	1·6	—0·3	6	11	6	8	6	2	2	5	10	N 12° E	S 68° E	27	15	54	66	Chanda.
·497	·572	·487	·519	+·048	79	58	36	58	+5	2·0	2·2	2·1	+0·6	30	7	...	2	1	8	2	2	4	S 85° W	S 15° E	6	24	15	62	Sironcha.
·247	·270	·263	·262	—·027	52	41	32	42	0	1·9	3·2	2·5	+1·0	10	9	...	1	2	13	4	5	12	S 59° W	N 75° W	29	29	174	142	Chikalda.
·263	·280	·231	·268	—·021	49	31	23	35	—1	0·6	1·7	1·1	—0·9	10	10	4	5	5	5	4	...	13	N 2° W	N 5° W	37	29	126	149	Buldana.
·304	·326	·274	·309	+·025	64	37	21	38	+2	1·8	2·9	2·3	+0·9	5	5	8	7	1	...	...	6	24	N 20° W	N 1° E	51	25	115	92	Akola.
		Not	computed							1·7	2·8	2·3	—0·7	1	13	...	11	5	23	2	...	1	S 41° E	S 83° W	34	40	?	?	Makhla.
·232	·201	·194	·220	—·009	53	23	17	30	0	2·4	2·6	2·5	+0·1	...	6	8	4	3	1	6	7	7	N 26° W	N 28° W	24	36	218	215	Deesa.
·441	·504	·601	·515	—·091	65	57	62	61	—8	0·8	0·7	0·8	—0·5	...	12	12	8	2	...	...	4	18	N 2° E	N 4° W	57	60	274	257	Bombay.
·294	·255	·228	·265	—·026	66	25	17	32	0	0·8	2·1	1·5	—0·1	13	...	2	10	6	1	1	13	10	N 64° W	N 28° W	10	21	148	152	Poona.
·370	·439	·438	·410	+·102	63	41	30	42	+8	1·2	2·9	2·1	+0·4	...	10	4	12	10	8	1	9	2	S 82° E	S 33° E	19	32	177	159	Sholapur.
·458	·507	·640	·544	—·049	71	44	57	60	—3	0	0	0	—0·4	...	10	...	2	2	8	3	10	21	N 61° W	N 52° W	48	52	216	292	Ratnagiri.
·642	·642	·736	·666	+·017	89	63	60	68	—5	0·2	0·3	0·3	—0·4	...	...	5	...	...	...	...	24	27	N 60° W	N 50° W	81	61	70	?	Karwar.
·379	·315	·285	·344	+·011	71	31	23	42	+4	0·1	1·8	1·0	—0·3	...	5	6	10	12	1	4	5	5	N 88° E	S 78° E	24	23	216	241	Belgaum.
·477	·476	·418	·457	+·056	80	49	32	54	+8	2·2	2·8	2·5	+1·2	9	1	7	22	2	4	...	3	8	N 73° E	S 71° E	37	46	45	90	Secunderabad.
·589	641	·673	·634	—·007	72	61	61	65	0	2·5	2·1	2·3	+0·9	...	7	11	4	3	11	9	10	1	S 38° W	S 11° W	9	43	53	49	Vizagapatam.
·450	·584	·514	·516	+·164	70	54	36	53	+16	1·4	1·7	1·6	+0·3	36	2	...	6	11	...	...	1	...	S 66° E	S 56° E	25	50	102	95	Bellary.
												Not	received.																Madras.
·644	·694	·659	·667	+·119	93	63	50	69	+12	3·6	5·3	4·5	+2·7	4	1	27	16	5	...	3	...	...	N 68° E	S 75° E	70	53	82	132	Salem.
·425	·447	·456	·442	+·014	89	59	49	66	+7	5·4	5·5	5·5	+3·2	...	5	12	30	...	...	...	2	7	N 60° E	N 59° E	65	35	67	93	Mercara.
·676	·668	·588	·644	+·032	91	62	47	67	+4	5·1	4·3	4·7	+1·8	3	5	26	15	6	1	...	...	...	N 64° E	N 65° E	36	74	118	100	Trichinopoly.
·777	·748	·789	·771	+·028	92	62	62	72	+1	1·5	1·6	1·6	—0·5	12	4	3	...	1	2	17	6	11	S 88° W	N 89° W	41	28	?	?	Cochin.
·323	·365	·423	·370	+·090	90	63	71	75	+17	4·7	6·1	5·4	+2·9	5	...	4	10	24	11	2	...	...	S 47° E	S 31° E	69	60	54	62	Wellington.
·380	·532	·559	·490	—·028	66	59	54	60	—9	2·4	2·1	2·3	+1·2	...	14	13	1	...	...	1	6	21	N 17° W	N 27° W	70	45	79	83	Akyab.
·625	·697	·679	·667	—·011	85	67	63	72	—1	3·0	3·6	3·3	+1·1	1	20	4	1	...	...	...	5	25	N 25° W	N 25° W	80	86	128	173	Diamond Island.
·567	·634	·546	·583	+·013	85	62	43	63	0	1·0	3·9	2·5	+0·5	...	6	12	5	7	7	6	7	4	N 76° E	S 56° W	8	13	88	96	Rangoon.
·631	·786	·783	·733	—·040	92	69	62	74	—2	3·4	4·2	3·8	+0·5	...	8	10	2	17	3	3	2	11	N 58° E	N 38° W	19	56	62	49	Mergui.
·689	·745	·715	·693	?	92	67	68	74	?	5·6	4·8	5·2	?	1	29	19	2	...	...	...	...	5	N 15° E	?	85	?	?	?	Cocos Island.
·753	·870	·859	·827	+·016	83	76	70	76	—1	3·9	4·3	4·1	+1·4	...	8	19	10	14	2	...	...	3	N 72° E	N 41° E	59	76	132	117	Port Blair.
?	·186	·200	?	?	97	74	72	81	+15	5·7	5·9	5·8	+1·6	37	...	...	...	3	2	4	6	4	S 67° W	N 76° W	19	30	48	100	Quetta.
·059	·078	·088	·075	+·001	91	71	70	77	+12	7·3	8·6	8·0	+1·3	7	...	3	7	6	12	18	3	...	S 5° W	S 25° E	48	18	16	33	Leh.
·188	·252	·327	·255	+·013	81	69	56	68	+3	4·4	5·4	4·9	+1·8	18	1	...	3	4	1	6	19	4	S 78° W	N 87° W	37	70	26	?	Katmandu.
·786	·848	843	·793	?	76	75	73	71	?	2·8	3·0	2·9	?	...	18	9	4	...	...	...	2	7	N 7° E	?	72	?	?	?	Minicoy.
·638	·665	·628	·644	—·008	78	67	61	69	—3	4·1	1·2	2·6	—1·6	...	1	6	35	8	2	1	1	...	S 86° E	N 81° E	80	72	400	331	Aden.

GOVERNMENT OF INDIA CENTRAL PRINTING OFFICE NO. 26 METEO.—21-7-91—400.



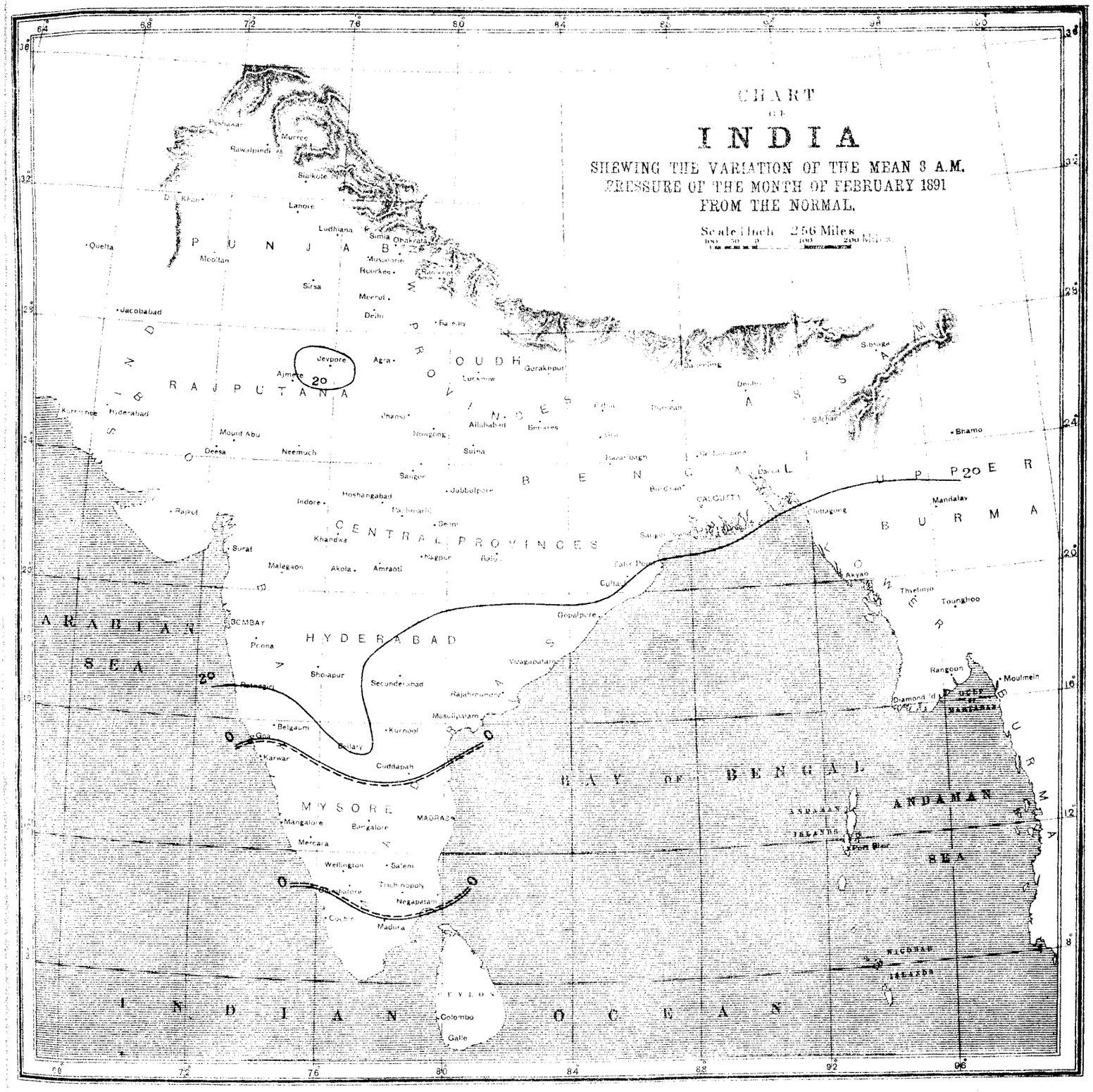
Explanation.

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 a difference 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 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.

Reg. No. 292, Wr., I.—July 91—415.

Litho., 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, &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, represent the line of no variation. the dotted line facing the area of deficient pressure or negative abnormals

Reg. No. 359, Wr., I.—July 91.—415.

Litho., S. I. O., Calcutta

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

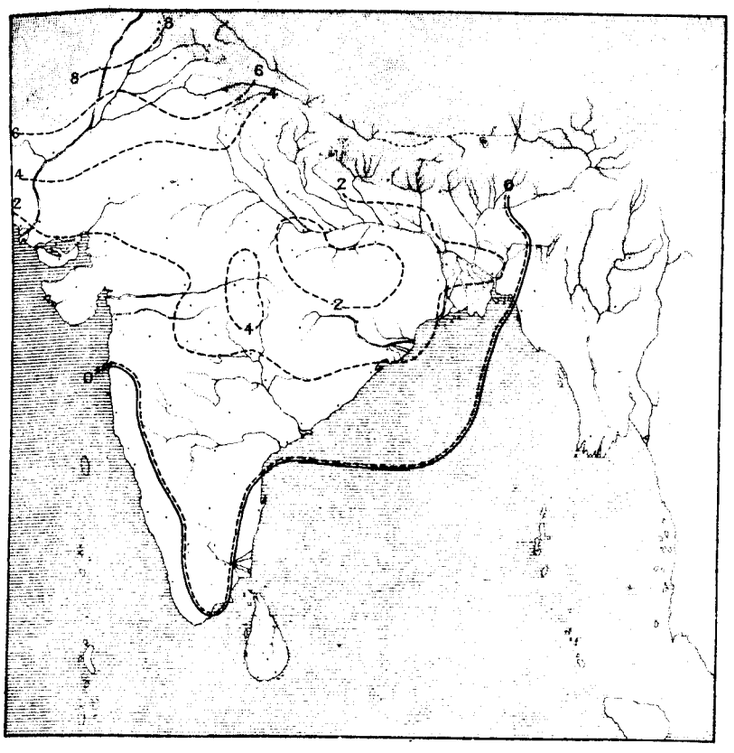
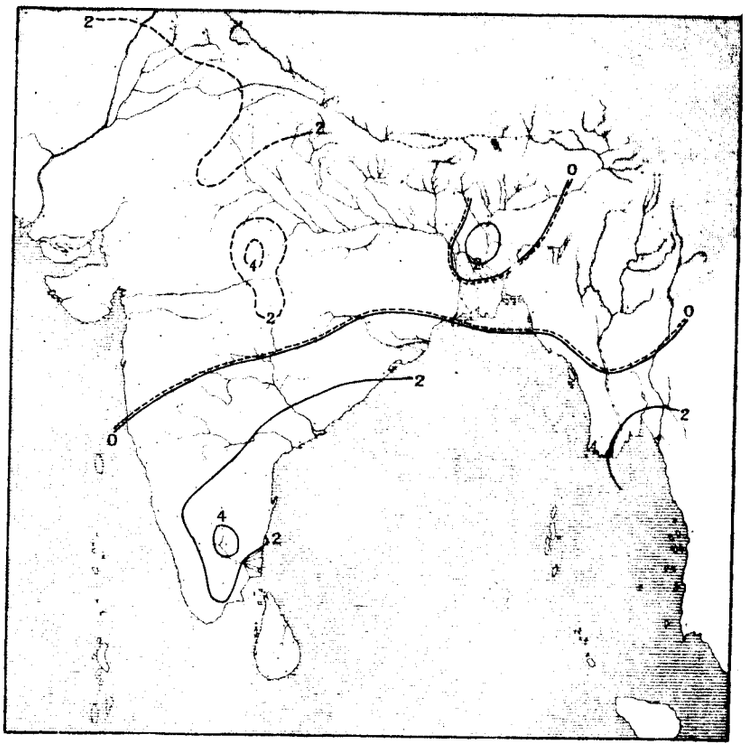


CHART SHEWING THE VARIATION OF THE MEAN MINIMUM TEMPERATURE OF THE MONTH FROM THE NORMAL.



Explanation.

Continuous lines indicate that the mean maximum of the month was in excess by the 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 the month was in excess by the 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.

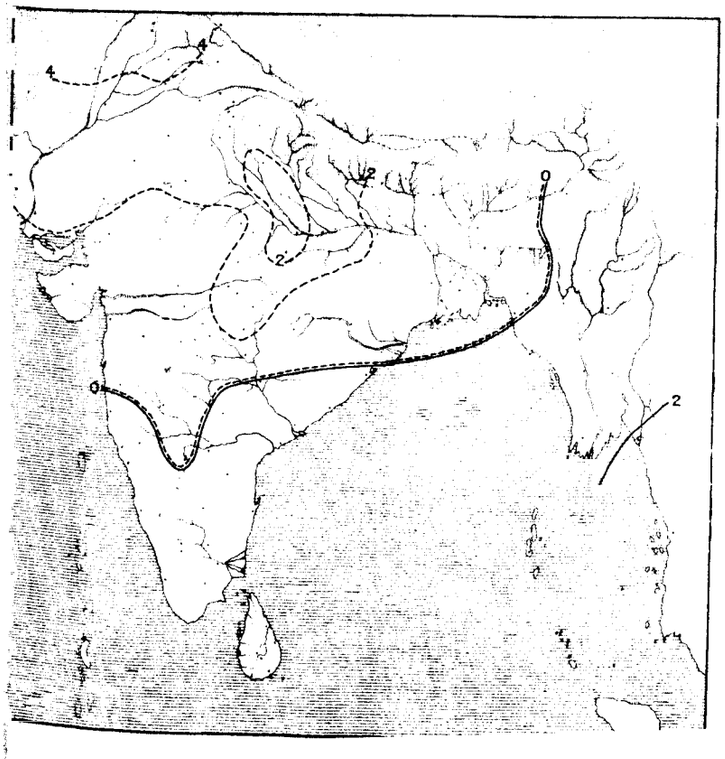
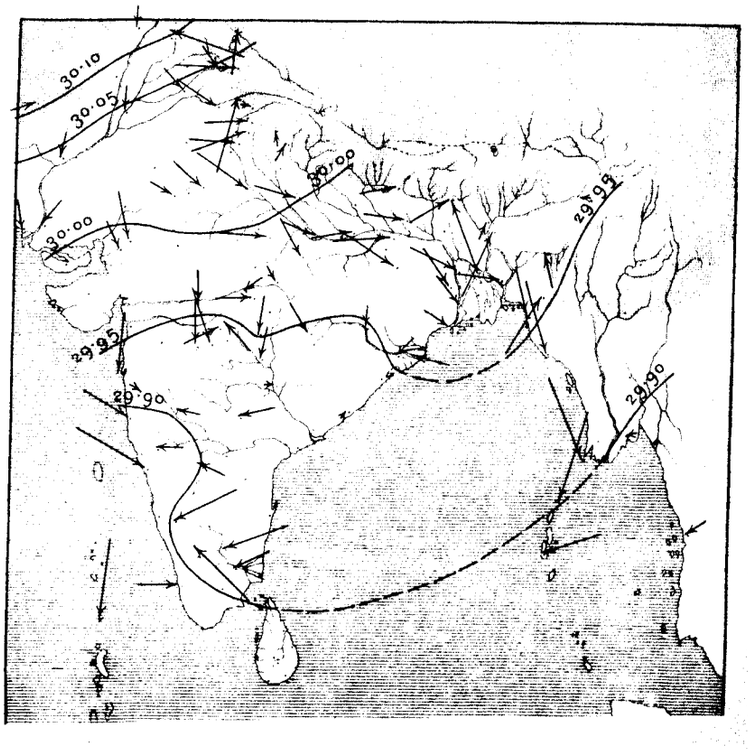


CHART SHEWING THE MEAN DISTRIBUTION OF PRESSURE AND THE RESULTANT WIND DIRECTIONS IN THE MONTH OF FEBRUARY 1891.



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. The double line or line of no rainfall separates areas in which the area 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.

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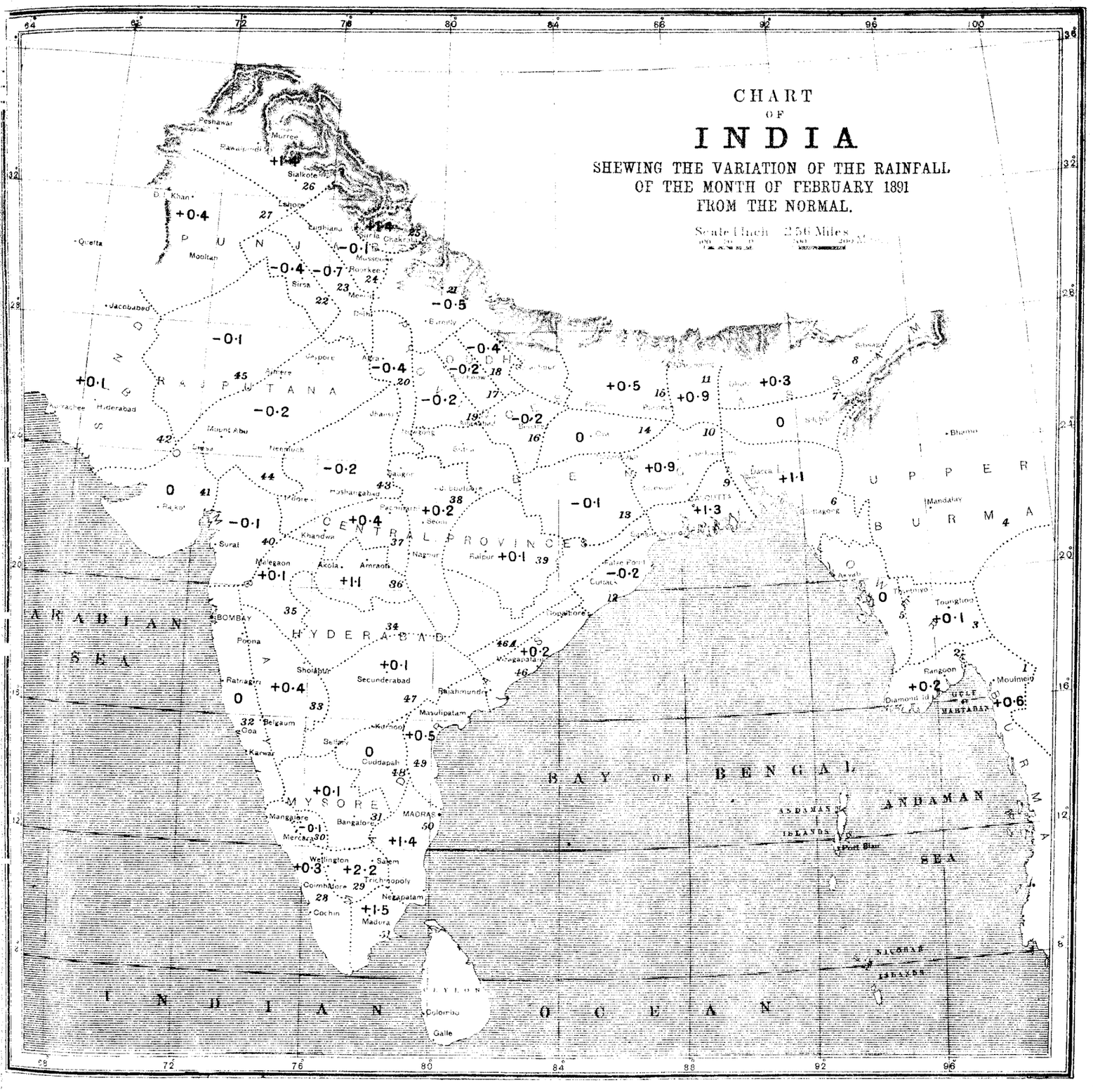


Explanation.

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 51 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 name of the districts 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	14 Behar (South)	27. Punjab (West)	40. Guzerat
2. Lower Burma	15. Do. (North)	28. Malabar	41. Kattiawar
3. Central do.	16. North Western Provinces (East)	29 Madras (South Central)	42. Sind
4. Upper do.	17. Oudh (South)	30. Coorg	43. Central India (East)
5. Arakan	18. Do. (North)	31. Mysore	44. Rajputana (East) Central India (West)
6. Eastern Bengal	19. North Western Provinces (Central)	32. Konkan	45. Rajputana (West))
7. Assam (Surma)	20. Do. do. (West)	33. Bombay Deccan	46. East Coast (North)
8. Do. (Brahmaputra)	21. Do. do. (Submontane)	34. Hyderabad (North)	46(a.) Do. do. (a)
9. Deltaic Bengal	22. Punjab (South)	35. Khandeish	47. Hyderabad (South)
10. Central do.	23. Do. (Central)	36. Berar	48. Madras (Central)
11. North do.	24. Do. (Submontane)	37. Central Provinces (West)	49. East Coast (Central)
12. Orissa	25. Do. (Hill Districts)	38. Do. (Central)	50. East Coast (South)
13. Chota Nagpore	26. Do. (North West)	39. Do. (East)	51. Madras (South)

Reg. No. 252, Wr., I—July 91.—415.

Litho., S. I. O., Calcutta.

GOVERNMENT OF INDIA.
METEOROLOGICAL DEPARTMENT.

MONTHLY WEATHER REVIEW,

PUBLISHED BY ORDER OF

THE GOVERNMENT OF INDIA.

CALCUTTA, MARCH, 1891.

INTRODUCTION.

THE present monthly report is based on observations taken daily at 8 A.M. at 154 stations and on additional observations taken at 10 A.M. and 4 P.M. at 86 stations. Arrangements are in progress for giving a monthly summary of the rainfall observations taken at about 2,500 rainfall stations; but, in consequence of unavoidable delays, the complete rainfall data for March are not yet available, and this rainfall summary for March is hence based on the rainfall data of the meteorological observatories and the weekly rainfall telegrams sent to Simla by the district officers throughout India. The meteorological data of the Bay of Bengal and the Arabian Sea, which are collected at the ports of Calcutta and Bombay, are used, so far as is at present possible, in discussing the meteorology of the month. Summaries of the snowfall information for the month of March, received from the district officers of the North-West Frontier and the Himalayan districts, are included in the report.

Summary of the chief features of the weather in India during the month of March, 1891.

The month of March is usually the commencement of the hot weather in Northern and Central India. The hottest area in February in India is defined by the isotherm of 80° and includes the South Deccan and the Tinnevelly, Madura, Trichinopoly, and Coimbatore districts of South Madras. The North Punjab is the coolest area at this time. The mean temperature of Peshawar and Rawalpindi, allowance being made for elevation above the sea, is slightly below 60°. Temperature during the next month increases least rapidly in Southern India and most rapidly in Central and Northern India, the rise of temperature varying from 3° in Southern India to about 10° in Northern India. The area of highest mean temperature for the month of March includes the whole of the Deccan, Berar and the greater part of the Central Provinces. In that area the mean daily temperature of the month slightly exceeds 85°, the highest mean temperatures being those at Cuddapah (87·7°), Kurnool (86·9°), Sironcha (85·4°) and Bellary (85·2°). When allowance is made for elevation above the sea, the temperature in the South and Central Deccan ranges from 87° to 89°. The lowest temperatures obtain in March, as in February in the North Punjab, where the mean daily temperature averages 65° during the month.

The slow change from the cold weather distribution of pressure to the hot weather and south-west monsoon distribution commences in March. Pressure continues highest in Upper India, but the difference of pressure between Upper and Southern India usually diminishes from a mean of ·2″ in February to a mean of ·1″ in March. One important change in the distribution of pressure occurs during this month, and accompanies the setting in of southerly winds on the Bengal coast. The combination of these winds, with the westerly winds of the Gangetic plain and the easterly winds down the Assam valley, tends to give a

permanent cyclonic circulation in North-Eastern India, and to develop a shallow depression, the central area of which usually lies over Chutia Nagpur and the Bilaspur and Sambalpur districts of the Central Provinces.

The weather of the month of March 1891 was even more abnormal than that of the two preceding months, and in all its more important features the meteorology of March was similar to that of January and February.

The weather was more or less disturbed during the month in Upper India and the mountain districts to the north and north-west. Heavy snow fell on the higher elevations, and the accumulation of snow in the Himalayan and Afghan mountain areas and perhaps in Central Asia, generally due to the abnormally severe winter, was probably greatest in this month and produced its maximum effect in reducing temperature in Northern and Central India. The reduction of temperature was greatest in the Indus valley and diminished in amount eastwards and southwards. It was even more strongly exhibited in the day than in the night temperature. The mean maximum or day temperature was more than 8° below the normal in Upper Sind, the Punjab, the greater part of the North-Western Provinces, Behar and West Bengal. The deficiency was absolutely greatest at Lahore (—10·8°) and Ludhiana (—10·5°). The minimum, or night, temperature was below the normal over the whole of India except Burma, Madras, and Mysore. The deficiency was greatest in the Punjab, where it ranged from 3° to 6°. The mean temperature of the month was hence more or less in defect over the whole of Northern and Central India and over a considerable portion of the Deccan. The deficiency was greatest in Upper India and the central districts of the Gangetic plain. It was absolutely greatest at Lahore (—8·4°), Ludhiana (—7·2°), Dera Ismail Khan (—7·2°), and Sialkot and Agra (—6·8°).

Temperature was below the normal to an even greater amount at the hill stations than in the plains. Thus, the mean temperature of the month at Murree was 9·6° below the normal, at Simla 8·6° below and at Mount Abu 7·6° below.

As a usual rule the variations of the day and night temperature in the month of March are opposite in character at the plains stations. The conditions, for example, which generally give diminished day temperature are cloudy or rainy weather. The same conditions, however, usually give higher temperature at night by diminishing terrestrial radiation. The weather in March was more disturbed than usual with much cloud and rain, but as has been stated above both the day and night temperatures were considerably below the normal in Western India.

It is hence evident that the effect of the local conditions of increased cloud and humidity was overpowered by the presence of larger and more massive conditions extending over a wide area, and the influence of which was greatest in North-Western India. The only possible explanation is the presence of the unusually large accumulation of snow over the whole of the mountain area to the north and north-west of India. It brought down to a lower level than usual over the whole of that area the plane of temperature of 32°, and there was in addition a larger and steadier drift than usual of cool air from these mountain districts into the plains of Northern India.

The following table gives the variations of the maximum, minimum and mean temperatures of the month from the normal in the eleven meteorological provinces of India.

PROVINCE.	VARIATION OF		
	Mean max. from normal of month.	Mean min. from normal of month.	Mean temperature from normal of month.
Burma Coast	+0·9	+1·0	+1·0
Burma, Inland	+0·2	+0·5	+0·4
Assam	—2·9	—1·1	—2·0
Bengal and Orissa	—5·6	—1·2	—3·4
Gangetic Plain and Chutia Nagpur	—7·7	—2·9	—5·3
Upper Sub-Himalayas	—8·7	—4·0	—6·4
Indus Valley and North-West Rajputana	—7·0	—3·7	—5·4
East Rajputana, Central India and Guzerat	—6·4	—2·7	—4·6
Deccan	—3·6	—1·6	—2·6
West Coast	—0·4	—0·8	—0·6
Southern India	—0·5	+0·6	+0·1

The following gives a brief history of the chief features of the weather of the month:—

At the commencement of the month pressure was approximately normal, the only feature of importance being a moderate deficiency in North-Eastern India. Temperature was above the normal except in Northern India. Weather became disturbed in North-Eastern India and the Central Provinces on the 4th, and a depression slowly formed in the eastern districts of the Central Provinces. This was maintained for a short period by a strong inrush of moist winds from the head of the Bay, which gave heavy rain to Assam, Bengal and Behar on the 5th, 6th and 7th and to the North-Western Provinces and Central Provinces (eastern districts) on the 6th and 7th, and light local showers in the Punjab, chiefly on the 7th. Chutia Nagpur received an average of 2½ inches and Central Bengal of 2 inches during this storm. This rainfall caused a large temporary reduction of temperature in Northern India Thus, over nearly the whole of Bengal, Behar, Chutia Nagpur and the North-Western Provinces the mean temperature of the 7th and 8th was from 6° to 12° below the normal. The depression filled up on the 7th. Pressure began to give way on the 8th in North-Western India, and fell steadily until the 11th, when a depression appeared in Sind and West Rajputana. So far as can be judged it apparently originated in that area, and was stationary in position on the 12th and 13th, covering West Rajputana and the adjacent portions of the Punjab and Sind. It determined a strong moist easterly current up the Gangetic plain from the head of the Bay. Hence the whole of Northern and Central India received general rain during this period, extending from the 11th to the 13th or 14th. Behar, Chutia Nagpur, Bengal and Assam obtained the largest

amounts. This depression filled up on the 14th, but was almost immediately followed by another disturbance, which passed from Beluchistan into Sind on the 16th. It advanced eastwards through Rajputana on the 17th and broke up probably near or over the Himalayas on the morning of the 18th. This disturbance gave general rain in Beluchistan and the Punjab on the 16th and 17th. Temperature had been very largely reduced in Northern and Central India by the heavy and general rainfall of the previous disturbance. On the 14th and 15th, for example, the mean temperature was from 10° to 15° below the normal of the day over the whole of Northern and Central India. After the disappearance of the depression of the 16th to 18th weather continued slightly unsettled with occasional thundershowers over the whole of Northern and Central India. The period from the 21st to the 25th was one of daily thundershowers in South-West Bengal and Chutia Nagpur and the eastern districts of the Central Provinces. In Southern India, more especially Travancore, thunderstorms occurred on the 26th and 27th and gave moderate rain. In consequence of this disturbed weather, and of the general conditions in Upper India, temperature was largely below the average from the 16th to the end of the month over the whole of Northern and Central India. The temperature conditions were in fact such as usually obtain in the month of February.

Winds were steadier and stronger at the hill stations of Upper India, and in the North-Western Provinces, but were on the average of the month fairly normal in direction. In consequence of the number and peculiar features of the disturbances in Northern India during the month, winds were remarkably unsteady in Bengal and the mean direction of the winds in West Bengal was north-west instead of south-south-west or south and practically identical with the directions of the prevailing winds in January instead of March. In North-Western and Western India very steady north-west winds extended further south and east in the west coast districts and the Deccan than usual. Winds were very irregular in direction in the Central Provinces, and in the southern districts they had a marked easterly component instead of the normal westerly element.

The distribution of aqueous vapour pressure was even more noteworthy than the winds. Over the greater part of Northern and Central India, although the amount of aqueous vapour was normal, or in slight to moderate defect, the air, in consequence of the decreased temperature, was much damper than usual. The excess was very marked at the hill stations, and the average humidity of the month was 10 or more in excess of the normal values, over the greater part of the Punjab and at the hill stations. The air contained on the average of the month more vapour than usual in West Bengal, Behar, and Chutia Nagpur, and the humidity was largely in excess. This feature of increased vapour amount and humidity was even more strikingly established in the eastern and southern districts of the Central Provinces and the Deccan, at many stations of which the aqueous vapour pressure was from one to two-tenths in excess or 20 to 75 per cent. above the normal amount. On the other hand, there was a large deficiency in the amount of aqueous vapour pressure in the west coast districts of Kattiawar and Sind. The variation was small and of little importance in Sind and Kattiawar.

The rainfall of the month was exceptionally heavy and widely spread. The first period of general rainfall was from the 5th to 7th, when the whole of Northern India received more or less general rain. The rainfall was very heavy in Bengal, Chutia Nagpur, Behar and some parts of the North-Western Provinces and Oudh. The second period of disturbance and rainfall was from the 11th to the 15th, when Northern and Central India obtained general rain. It was again heaviest in the eastern districts, including Behar, Chutia Nagpur, Bengal and Assam. A disturbance of a different character gave light rain to Beluchistan and the Punjab on the 17th and 18th. During the remainder of the month the weather continued slightly disturbed with numerous series of thunderstorms. North-Eastern India received moderate and fairly general rain from this source from the 21st to the 25th, and Southern India during the last week of the month.

Burma, Tenasserim, Khandesh, Guzerat and Kattiawar received practically no rain. There was a large deficiency in Assam, averaging 4 inches. It was most marked in Cachar, which obtained barely a third of its normal supply. Some parts of Madras also received less than usual. The remainder of India obtained amounts more or less largely in excess. The excess was most marked in Behar, Chutia Nagpur, the Central Provinces, East and the North-Western Provinces, which received from four to six times their normal amount. The following table gives comparative data for the eleven meteorological provinces of India :—

METEOROLOGICAL PROVINCES.	RAINFALL.		
	Rainfall of month	Normal rainfall of month.	Variation from normal.
Burma Coast	0·29	0·49	−0·20
Burma, Inland	0·22	?	?
Assam	3·37	5·58	−2·21
Bengal and Orissa	3·47	1·71	+1·76
Gangetic Plain and Chutia Nagpur	2·72	0·50	+2·22
Upper Sub-Himalayas	2·03	1·04	+0·99
Indus Valley and North-Western Rajputana	0·88	0·44	+0·44
East Rajputana, Central India and Guzerat	0·55	0·13	+0·42
Deccan	0·46	0·27	+0·19
West Coast	1·11	0·39	+0·72
Southern India	0·53	0·45	+0·08

The snowfall in the hill districts of Upper India was also much greater than usual and the accumulation in the higher valleys and elevations greater, probably, than in any year since 1877.

Atmospheric Pressure.

The distribution of mean 8 A.M. pressure for March is shown by means of two charts. The first chart (Plate I) gives the distribution of the mean 8 A.M. pressure of the month reduced to sea-level and to constant gravity (that of latitude 45°) by means of isobars drawn for differences of pressure of ·05″ or $\frac{1}{20}$th of an inch. The second chart (Plate II) gives the variations of the actual mean pressure from the normal pressure. These values are obtained from the barometric readings reduced for temperature only. A small chart, No. 4 of Plate III, gives the distribution of the monthly mean daily pressure and of the mean winds in the same form and manner as in the monthly charts given hitherto in the annual reports on the meteorology of India. The data on which this chart is based are given in Table II.

The data that are chiefly used in this discussion are the 8 A.M. reduced observations and the variations derived from a comparison of these observations and the normal values given in Table I. The means in the third column are not only reduced or corrected to sea-level, but also to constant gravity. The normal means are obtained from the observations of the period 1878—88; and in order that the means and variations may be strictly comparable, the means have been calculated for observations of the same period in all cases.

The more important barometric changes and movements during the month are fully given in the following statement of the barometric depressions of the month.

The mean pressure of the month of the whole of India was ·015″ above the normal mean of the month.

Pressure was in excess over the whole of Northern India. The excess was greatest in the Indus valley between Jacobabad and Peshawar, and diminished in amount eastwards and southwards. It was, on the other hand, in defect in Upper Assam, Burma and the greater part of the peninsula. The deficiency was greatest in Lower Burma and the southern districts of Madras and Mysore, and probably across the centre of the Bay.

Deducting ·015″ from the variations the local anomalies are obtained. They show even more clearly than the variations the contrast between the excessive pressure in Northern India and the deficient pressure in the peninsula, Burma and Assam.

The positive anomalies exceeded ·03″ in Upper Sind and the Punjab, and were absolutely greatest at the following stations:—

Station.	Positive pressure anomaly.
Jacobabad	+·050″
Mooltan	+·038″
Peshawar	+·038″
Rawalpindi	+·039″

The negative anomalies exceeded ·03″ in Lower Burma and in the peninsula south of latitude 16° N., and were greatest in the areas represented by the following stations:—

Province.	Station.	Negative pressure anomaly.
Assam	Sibsagar	—·038″?
Lower Burma	Mergui	—·038″
	Rangoon	—·037″
	Diamond Island	—·038″
Andamans	Port Blair	—·022″
Southern India	Negapatam	—·040″
	Coimbatore	—·042″
	Bangalore	—·042″
	Mangalore	—·036″
	Secunderabad	—·036″

The mean pressure of the month at the hill stations in Northern India was in every case below the normal of the month, and in this respect the pressure conditions at the hill stations stand in marked contrast to those at the plains stations. The following gives the variations for the hill stations, and also those at the neighbouring plains stations for comparison:—

Hill Station.	Variations of mean pressure of month from normal.	Neighbouring plains station.	Variations of mean pressure of month from normal.
Leh	—·060	Lahore	+·047
Quetta	—·007	Jacobabad	+·063
Murree	—·005	Rawalpindi	+·054
Ranikhet	—·004	Bareilly	+·043
Darjeeling	—·008	Dhubri	+·026
Pedong	—·014	...	...
Mount Abu	—·006	Deesa	+·021

These figures are very consistent and show that the excess of pressure observable at the level of the plains was solely a phenomenon of the lower 5,000 feet of the atmosphere, and that above that elevation it was in defect by amounts increasing with elevation up to 12,000 feet, at which it was as largely in defect as it was in excess on the plains of Northern India. It was partially, if not entirely, due to the condensation or contraction of the air near the earth's surface due to its decreased temperature.

It may also be noted that the vertical pressure conditions in Southern India and Ceylon were the reverse of those in Northern India; in other words, pressure was in defect at the sea-level, whilst it was in moderate excess at the level of Wellington and Newara Eliya.

A reference to the monthly reports of the months of January and February will show that the following features of the distribution of pressure have been very persistent throughout during the whole period. These are—

1st.—Pressure in excess of the normal over the whole of India.

2nd.—Relative excess of pressure in Northern India greatest in amount on the north-west frontier, and decreasing southwards and eastwards.

3rd.—Relative deficiency of pressure in Assam, Burma and the peninsula, greatest in amount in Lower Burma and the southern districts of Madras and Mysore. There was also a general tendency for the area of local deficiency to extend in North-East India.

4th.—A deficiency of pressure at the hill stations, which probably began at an elevation of 4,000 feet or 5,000 feet, and increased in amount up to an elevation of 12,000 feet at least. The deficiency in Upper India at that elevation, judging from the data of the Leh and Kailang stations, was as large in amount as the excess at the level of the Punjab plains.

Barometric depressions and cold weather storms of the month.

At the commencement of the month pressure was lowest in Central Burma. The differences of pressure over India were very small, and pressure was approximately uniform. The barometric changes of the next two days were generally small in amount and somewhat irregular. On the 3rd pressure increased over the whole of India, the rise being large in Northern India. During the next forty-eight hours the only important change was a brisk fall in the Central Provinces and eastern districts of the North-Western Provinces, which resulted in the formation of a shallow depression in that area on the 6th. Its position is defined by the observations of the following stations :—

Station.	Pressure.			Wind.		Cloud 8 A.M.
	8 A.M.	Change in past 24 hours.	Variation from mean of day.	Direction 8 A.M.	Velocity per hour past 24 hours.	
Raipur	29·875	—·026	—·048	SSW	10	0
Sutna	·841	—·047	—·111	E	10	5
Jubbulpore	·845	—·063	—·094	W	2	2
Nowgong	·867	—·048	—·090	N	3	8

As usual in these cold weather depressions the chief development of cloud was to the north of the central depression. Some local showers fell in the Punjab and the eastern and central districts of the Central Provinces, and general rain in the eastern and central districts of the North-Western Provinces, and in Assam, Bengal and Behar during the disturbance, but the amounts were generally moderate except in South Bengal, Chutia Nagpur and Assam, where several stations received amounts, ranging between 2 and 4 inches in twenty-four hours.

A very rapid rise of the barometer (exceeding three-tenths of an inch at several stations) occurred in the area of depression during the day, and the depression hence completely disappeared before the morning of the 7th. A small residual disturbance however appears to have passed eastwards, as there was a local fall of pressure in Central Bengal on the 7th and a smaller fall in Upper Burma on the 8th.

Thunderstorms occurred over the greater part of Bengal, Behar, Chutia Nagpur and the North-Western Provinces on the 5th and 6th. Skies cleared partially on the 7th over the whole of Northern India, and on the morning of the 8th were either clear or lightly clouded.

In consequence of the rapid increase of pressure on the 7th, high pressure conditions with light westerly winds were established for a short interval in Northern India. Pressure began to give way generally on the afternoon of the 8th, and fell steadily over the whole of India until the 11th. This continuous fall was greatest in North-Western India, where it averaged three-tenths of an inch, and preceded the appearance of a depression in Sind and West Rajputana on the morning of the 11th.

(1) *Depression and storm of the 11th to 14th March.*—The following observations show the character and position of the depression on the 11th :—

Station.	Pressure.			Wind.		Cloud 8 A.M.
	8 A.M.	Change in past 24 hours.	Variation from mean of day.	Direction 8 A.M.	Velocity per hour past 24 hours.	
Mount Abu	25·957	—·078	—·143	SW	7	0
Deesa	29·799	—·094	—·152	NW	8	2
Ajmere	·835	—·052	—·144	S	4	5
Montgomery	·856	—·036	?	ENE	12	9
Mooltan	·792	—·136	—·157	Calm	1	4
Jacobabad	·831	—·056	—·097	Calm	4	10
Hyderabad	·821	—·047	—·117	NW	12	10

The depression although well marked was shallow and the cyclonic circulation feeble at this stage.

The Bushire observations establish that a very shallow depression passed eastwards to the north of that station on

the 7th and 8th, and it is possible that the present disturbance may have been the continuation of that depression. This appears further to be confirmed by the fact that there was a continuous fall of the barometer for three days during the passage of the depression at Bushire, similar to but smaller in amount than that which occurred in Northern India before and during the appearance of the storm. This is shown fully by the following data:—

Barometric changes during 24 hours preceding 8 A.M. of	Bushire.	Quetta.	Jacobabad.	Murree.	Rawalpindi.	Lahore.	Leh.	Mount Abu.	Deesa.
4th . .	+·088								
5th . .	−·075								
6th . .	−·061								
7th . .	−·035	0	−·037	+·043	+·086	+·071	+·048	+·062	+·036
8th . .	+·086	−·010	+·057	+·034	−·024	+·012	+·072	+·017	+·025
9th . .	+·006	−·030	−·092	−·096	−·142	−·140	+·035	−·053	−·052
10th . .	−·052	−·032	−·071	−·025	−·056	−·057	−·080	−·069	−·053
11th . .	+·011	−·086	−·056	−·057	−·032	−·022	−·027	−·078	−·094
12th . .	+·023	+·021	−·011	−·054	−·038	−·113	−·069	−·105	−·045
13th . .	...	−·004	+·005	−·013	+·044	+·072	−·076	+·131	+·132
14th . .	...	+·064	+·104	+·102	+·082	+·112	+·082	+·061	+·031

The pressure changes in India, it will be seen, give no marked indications of the eastward transfer of an area of low pressure from Beluchistan into Sind and Rajputana. The larger barometric movements were almost simultaneous at Leh, Mount Abu and Quetta. They were most pronounced at Mount Abu, and were considerably larger at Leh than at Quetta. A consideration of these facts and of the whole of the observations appears to establish that, even if this depression and disturbance advanced eastwards across Persia and Afghanistan, it developed considerably in India. This development of the depression apparently occurred in Rajputana, after a period of diminishing pressure over the whole Indian area lasting for three days. As will presently be seen, this inference is confirmed by the phenomena of the storm on the 12th and 13th.

Winds were very light and unsteady in the area of depression on the 11th. Southerly winds prevailed at the head of the Bay, and easterly winds in the Gangetic plain. Hence the general fall of the barometer of the previous three days had initiated a gentle indraught from the head of the Bay into the Gangetic plain. Skies were overcast in the Punjab and the western districts of the North-Western Provinces and the larger portion of Bengal, and were more or less heavily clouded over the whole of North-Western India. The weather was slightly unsettled over the whole of Northern India, and numerous thunderstorms had occurred during the preceding twenty-four hours in Bengal, Behar, the North-Western Provinces, Central India, Rajputana, Sind and the Punjab.

The depression in North-Western India intensified slightly during the next twenty-four hours and remained almost unchanged in position. The following observations define its position at 8 A.M. of the 12th:—

Station.	Pressure.			Wind.		Cloud 8 A.M.
	8 A.M.	Change in past 24 hours.	Variation from mean of day.	Direction 8 A.M.	Velocity per hour past 24 hours.	
Ajmere . .	29·757	−·078	−·229	S	4	8
Lahore . .	·749	−·113	−·192	E	4	10
Montgomery .	·707	−·149	?	NNE	10	8
Jacobabad . .	·820	−·011	−·097	W	3	0
Deesa . .	·754	−·045	−·199	SW	14	3

The centre of the depression was probably a little to the north of Bikaneer, and the amount of the depression at the centre did not exceed a quarter of an inch.

Skies at 8 A.M. of this day were overcast in the Punjab and western districts of the North-Western Provinces, and were heavily clouded in Bengal and the Gangetic plain. There was moderate cloud in Rajputana, but skies were now clear in Sind.

A moderate and fairly well-marked cyclonic circulation obtained in the depression. The most important feature of the air movement on this day was undoubtedly the steady damp easterly winds which prevailed over the whole of the Gangetic plain. Weather was gloomy and unsettled, with frequent thunderstorms, over the whole of Northern India, and general rain had been received during the previous twenty-four hours in Bengal, the North-Western Provinces, the Punjab, Rajputana, Sind and Central India. The largest amounts (in some cases exceeding 2 inches) were recorded in the East Punjab and Bengal.

The depression remained practically stationary in position during the day, but began to fill up. The following observations define its position and character at 8 A.M. of the 13th:—

Station.	Pressure.			Wind.		Cloud 8 A.M.
	8 A.M.	Change in past 24 hours.	Variation from mean of day.	Direction 8 A.M.	Velocity per hour past 24 hours.	
Deesa	29·886	+·132	−·061	WSW	9	0
Ajmere	·893	+·136	−·084	SW	9	4
Sirsa	·792	+·078	−·141	WSW	7	10
Lahore	·821	+·072	−·117	E	5	10
Mooltan	·820	+·082	−·121	Calm	2	0
Jacobabad	·825	+·005	−·088	NE	5	0
Hyderabad	·798	−·038	−·127	NW	10	0

The depression was now elliptical shaped, the longer axis running from Hyderabad to Sirsa, and the centre was less clearly defined than on the previous day, but was probably near Bikaneer. The depression at the centre was now less than two-tenths of an inch.

Skies were overcast over the whole of Northern India from Bengal to the Punjab, but were clear, or very lightly clouded over the peninsula and in Central India, Rajputana and Sind. Strong easterly winds had prevailed during the previous 24 hours over the whole of the Gangetic plain, and rain (chiefly accompanying thunderstorms) had fallen more or less generally over the whole of Northern and Central India. Rainfall, varying from 2 to 3 inches in amount, had been received at many stations in Bengal, Behar, Chutia Nagpur and the North-Western Provinces, and showers in the Punjab and Rajputana.

The barometer rose rapidly in North-Western India during the day, and on the morning of the 14th high pressure conditions were established in Upper India, and the disturbance and depression of the previous twenty-four hours had filled up completely. Skies had cleared very rapidly in the Punjab, the North-Western Provinces and Behar, but were still heavily clouded in Bengal. Light showers had fallen in Bengal, the Punjab and western districts of the North-Western Provinces, but the amounts were generally small. Calms were reported by the great majority of stations in the Punjab and North-Western Provinces on this day, and light irregular winds in Bengal.

The preceding storm differed in many important points from the cold weather storms of the preceding months of January and February, more especially in the following:—

1st.—It was during the whole period of its existence in India a stationary, and not a moving depression.

2nd.—It formed in Rajputana during a period of general and continuous decrease of pressure, and may have been the development of a small and unimportant depression, which apparently advanced across Central Persia three days previously to the appearance of the depression in North-Western India; but this appears on the whole to be very doubtful.

3rd.—Although it was a feeble storm, it gave rise to a more clearly-defined cyclonic circulation than usual in the cold weather.

4th.—During its existence an unusually strong and steady influx of moist winds from the head of the Bay extended over the whole of Northern India from Bengal to the Punjab, which gave very disturbed weather and unusually heavy and general rain over the whole of that area for a period of three days.

5th.—The fact that it was stationary from the 11th to the 13th appears not only to be a strong proof that it did not enter India from Beluchistan, and was formed in India, but also that it was not generated in the upper easterly atmospheric current in which the cold weather storms are usually embedded and carried across India. It was apparently a storm generated in North-Western India during a period of decreasing pressure, which caused an unusual influx of moist winds from the head of the Bay up the Gangetic valley. These suppositions would evidently explain the distribution of the rainfall, the general character of the weather, and the occurrence of numerous hail and thunderstorms.

Storms of this class, *viz.* depressions during the cold weather months, initiated in India itself and dependent mainly for their continuance upon an unusual influx of moist winds across the Northern India, are undoubtedly of occasional occurrence.

The barometric changes on the 14th were generally small, but re-established normal conditions of pressure. Skies cleared in Bengal and were free from cloud over nearly the whole of India. Pressure began to give way in North-Western India on the 15th, and the observations indicated that a depression was entering Sind from Beluchistan.

(2). *Depression and storm of the 15th to the 17th March.*—A depression passed eastwards to the north of Bushire on the 12th and 13th, and it is probable that this disturbance advanced at the rate of about 400 miles per diem, and entered Beluchistan on the 15th.

The following table gives the barometric changes at certain stations from the 12th to the 18th:—

Barometric changes during 24 hours preceding 8 A.M. of	Bushire.	Quetta.	Jacobabad.	Mount Abu.	Deesa.	Murree.	Lahore.	Leh.
12th . .	+·023							
13th . .	—·128							
14th . .	+·090							
15th . .	—·080	+·019	+·026	+·048	+·019	+·054	+·020	+·060
16th . .	—·057	—·026	—·068	+·010	—·004	+·011	+·005	+·009
17th . .	+·024	—·014	—·003	—·033	+·009	—·061	—·083	—·055
18th . .	+·058	+·143	+·103	+·073	+·056	+·064	+·081	—·009
19th . .	+·043	+·006	+·016	+·003	—·010	+·026	+·015	+·084

The following observations show that the depression was entering Sind on the morning of the 16th:—

Station.	Pressure.			Wind.		Cloud 8 A.M.
	8 A.M.	Change past 24 hours.	Variation from mean of day.	Direction 8 A.M.	Velocity per hour past 24 hours.	
Quetta . .	...	—·026	—·060	Calm	1	4
Kurrachee . .	29·910	—·020	—·021	WNW	10	5
Hyderabad .	·891	—·021	—·016	SW	6	10
Jacobabad .	·887	—·058	—·006	E	3	4

The depression was evidently not a large or important one. Skies were clear except in Sind and the Punjab, and

westerly winds obtained in the Gangetic plain, and northerly winds in Central India and the Central Provinces. Pressure increased during the day in North-Eastern India and diminished in North-Western India. The observations of the morning of the 17th show that the depression had been transferred about 400 miles in an E. N. E. direction and covered the South Punjab at 8 A M. of that day. The following observations indicate its position and character at that hour :—

Station.	Pressure.			Wind.		Cloud 8 A.M.
	8 A.M.	Change past 24 hours.	Variation from mean of day.	Direction 8 A.M.	Velocity per hour past 24 hours.	
Sirsa . .	29·819	—·119	—·098	SE	6	9
Lahore . .	·875	—·083	—·047	Calm	3	10
Montgomery .	·831	—·137	?	N	7	3
Mooltan . .	·914	—·076	—·012	NE	1	10

Heavy rain had fallen in the North and North-West Punjab during the previous twenty-four hours, and skies were generally overcast in the Punjab. They were clear in the Gangetic plain, down which westerly winds continued to blow.

The barometer rose rapidly during the day in the Punjab as the depression moved eastwards towards the hills. The depression disappeared before the morning of the 18th. Light showers had fallen chiefly in the north of the Punjab during the previous day. Skies cleared rapidly on the 18th, and on the morning of the 19th they were clear or lightly clouded over the whole of India.

Westerly winds continued in the Gangetic plain, so that the air motion in that area had been absolutely unaffected in direction by the passage of the small depression.

This small storm was evidently an example of the numerous class of cold weather disturbances which advance across Beluchistan into India. It was probably the same disturbance which passed to the north of Bushire on the 12th.

If this be the case, it advanced eastwards at the rate of about 400 miles per diem, which is probably a little less than that of the easterly current which carries them across Northern India. The extent of area occasionally affected by these cold weather storms is further shown by the fact that the sky at Meshed, in North-Eastern Persia, which was clear from the 10th to 13th, clouded over on the 13th, and was overcast until the 17th, on which day it again cleared, and fine clear weather prevailed until the 20th. This storm as has already been shown, affected Bushire. It contrasts strikingly with the previous storm, as the rainfall accompanying it was restricted to Beluchistan and the Punjab, and during its existence fine, clear, dry weather obtained in the Gangetic plain.

There had been a tendency to deficient pressure in North-Eastern India during the greater part of the month. It was very marked at Sibsagar and Darjeeling throughout the month. The changes of pressure on the 18th were not large, but they brought into prominence this slight deficiency of pressure. On the morning of the 19th a very shallow depression lay over Central Bengal. The weather was fine, with slight cloud over the whole of Northern India. The barometer fell over the whole of India during the day, and weather became slightly unsettled in the Punjab and Bengal, in both of which areas light thundershowers fell during the day. Pressure began to increase on the 21st, and increased steadily until the 23rd, when anti-cyclonic conditions were again established in Northern India.

Pressure was nearly two-tenths of an inch higher in the Punjab than in Southern India on the 23rd and 24th. The weather continued disturbed in Bengal with local thunderstorms and hailstorms. On the 25th pressure began to fall over the whole of India, and on the morning of the 25th very shallow depressions were shown in South-West Rajputana and Sind, the north-western districts of the North-Western Provinces and West Bengal. Each of these very shallow depressions appears to have originated in the area affected. Pressure increased rapidly in the North-West Frontier districts during the day and fell in the Gangetic plain. The result of these changes was to give a large shallow depression covering the whole of the North-Western Provinces and East Rajputana and Bundelkhand. Skies were partially clouded in this area, and light thundershowers had fallen during the previous day, chiefly in the East Punjab and Central Provinces. During the next twenty-four hours the shallow depression filled up and the barometer began to rise, with the result that on the 28th high pressure conditions with clear skies were established in Upper India. On the 29th and 30th pressure gave way over nearly the whole of India, and a shallow depression formed in Central Burma, which was apparently due mainly to the abnormally high temperature of that area. At the end of the month pressure was very uniform over the whole of Northern and Central India, and the barometer was falling briskly on the North-West Frontier.

Summary of the reports of the weather and snowfall in the mountain districts to the North and North-West of India.

The snowfall reports show that the weather in the mountain districts to the north of India was unusually stormy, and that heavy to excessive snow continued to fall throughout the month in the higher ranges. The accumu-

lation of snow in the higher ranges was hence excessive, and the snow line was at a lower level throughout the month than has been known for many years. The whole of the data seem to establish that the precipitation during the past winter has probably been from four to six times at least its normal amount over the Punjab Himalayas and in Kumaon and Garhwal. The effect of this abnormally large snowfall upon the meteorology was most marked during the month.

I.—The Afghan highlands.

(*a*) *Suleiman Range.*—The Deputy Commissioner of Dera Ismail Khan describes the winter of 1890-91 in the following general terms :—" Snow began to fall in the early part of the season, *i.e.* about the end of November, and was unusually heavy. Towards the end of December the Nave Tezha, Sapreza, Bushta and Kaisarghar peaks of Takht Suleiman and the Pirghal range in the Mahsad country were well covered with snow, which continued generally till the middle of March. In the lower ranges, such as Kashmir Kar, the snow disappeared in February. The total fall is said to have been between five and six feet in depth, and on some of the higher ranges the snow still remains unmelted. Rain fell in abundance, and the season was a severe one with great cold. It may also be mentioned that snow fell on the sanitarium of Shekh-buddin for the first time for many years, and the low Bhittani mountains of Ghabbar had also snow at the end of December."

(*b*) *Hills bordering Kohat.*—The Assistant Commissioner, Thul, states that snow occurred twice (*viz.* on the 10th and on the 17th) during the month on the Spinghar and other high mountain ranges. The approximate depth reported was as follows :—

Spinghar	9 to 12 feet.
Dandoghar	4 inches.
Torghar	4 "

" The snow melted away before the end of the month to a great extent from all the mountains except Sufed Koh, on which it still lay to a depth of about six to nine feet."

(*c*) *Hills bordering the Peshawar district.*—The snowfall on the hills bordering the Yusafzai sub-division of the Peshawar district in the month of March is shown by the following returns :—

Mahaban	1½ feet.
Bagoch	1 foot.

II.—The Kashmir and Punjab Himalayas.

(*a*) *Murree and Kashmir.*—The Deputy Commissioner, Rawalpindi, sent the following returns of the snowfall at Murree and Kahuta :—

DATE.	Approximate depth of snowfall at Murree, Feet.	Inches.
11th	0	6
14th	0	6
18th	0	2
19th	0	2
22nd	0	6
23rd	0	6
24th	0	2
25th	0	4
TOTAL .	2	10

No snow fell at Kahuta.

(*b*) *Kulu.*—The following table shows the reported depth of snow on the higher passes in the Kulu sub-division on the 25th March 1891, and the depths on the corresponding dates of the two previous years for comparison :—

Kulu District.

NAME OF PASS.	Height.	DEPTH OF SNOW AT END OF March 1891.	March 1890.	March 1889.
	Feet.	Feet.	Feet.	Feet.
Rotang	13,000	13	16	17
Hamta	14,500	13	10	16
Chandar khani . . .	?	14	6	10
Barsai	?	9	7	6
Bushtari	?	9	7½	3
Bujadhar	?	10	10	3
Lori Achri . . .	?	8	6	5
Bhubhu	10,000		3½	6
Majang	?	5	2	2

Plach District.

Name of Pass.	Height.	Depth of Snow at end of		
		March 1891.	March 1890.	March 1889.
	Feet.	Feet.	Feet.	Feet.
Chul	?	9½	4	6
Sirikhand	15,000	39	16	5
Maghian	?	11	5	6
Tikkar	?	9	?	?
Dundku	?	15	6	6
Ramgarh	?	½	?	?
Nuna	?	7	2	4
Jalori	10,500	7	4	4
Raghopur	?	8	5	5
Himri	?	8	5	4
Sakiran	?	13	?	?
Suphakham	?	23	8	8
Gargarasan	17,000	28	10	12
Bashleo	11,000	9	6	6
Plach	?	11	11	10
Tirath	?	15	12	13

The Extra Assistant Commissioner adds that "it was cold and damp and the sky cloudy during the month. Snow fell every now and then, and the passes were stil closed at the end of the month. Hail also fell at some places during the month, but no serious injury was done".

III.—The North-Western Provinces Himalayas.

Pauri Gurhwal.—The Senior Assistant Commissioner writes of the weather during the past winter in the following terms:—"It appears that the snowfall during the past winter in the northern parts of the district has been no less than about four times the average amount. Pain Khanda is the northernmost pargana of the district. From Pain Khanda the Niti and Manâ passes lead into Thibet. These passes have been closed since the 16th September last, and not a week has passed since then without snow falling. It is not expected that the passes will be open before August next."

Summary of Special Storm Reports.

There were three periods of disturbed weather during the month when numerous thunderstorms, hailstorms and duststorms occurred. Some of these were very severe. The following gives a brief statement of the more important storms, of which accounts have been received from observers:—

First period, March 5th to 9th, during which a depression advanced from the Central Provinces to Bengal—

5th.—Severe thunderstorm with violent wind and heavy rain at Hazaribagh on night of 5th.

6th.—Severe hailstorm at Kishnaghur from south-west at 10-20 P.M., which caused slight damage to property.

Thunderstorm with heavy rain at Hazaribagh from 7 to 8-30 P.M.

Duststorm at Sutna from 3 P.M. to 3-30 P.M.

Severe thunder and hailstorm at Allahabad.

8th.—Thunderstorm at Chikalda from 4 to 5 P.M.

9th.—Hailstorm at Nagpur from 5 to 6 P.M., which did much damage to the crops.

Thunderstorm at Chikalda from 2 P.M. to 4-30 P.M.

Second period of disturbed weather, March 10th to 14th, during the existence of a stationary depression in North-Western India—

10th.—Severe duststorm at Jacobabad from west, lasting from 3-15 P.M. to 3-30 P.M., during which the darkness was very great. Duststorm at Hyderabad (Sind) from 4-35 P.M. to 6 P.M. Wind shifted from S. W. to N. E. and back to S. W. The storm gave very violent winds, their average velocity when strongest being 65 miles per hour.

Thunderstorm at Chikalda from 5 to 6 P.M.

11th.—Thunderstorm with very strong winds at Deesa. Gale of wind and duststorm from west at Bhuj.

Severe thunderstorm and strong wind at Hazaribagh from 5-45 P.M. to 6-15 P.M.

12th.—Thunderstorm at Saugor from 2-30 to 3-50 P.M. The wind rose to a strong gale.

Thunderstorm at Delhi from 0-15 P.M. to 2 P.M.

Thunderstorm at Cawnpore from 3 P.M. to 4-15 P.M. It passed from S. W. to N. E. Wind changed from E. to S. E. during the storm.

Thunderstorm at Sutna from 2 A.M. to 5 A.M. from N. W.

Duststorm at Khandwa from west at 0-45 P.M.

Third period of disturbed weather from 18th to 26th March—

18th.—Severe duststorm with very strong winds at Belgaum from 6 to 7 P.M.

19th.—Severe hailstorm and snowstorm at Murree.

21st.—Severe hailstorm and snowstorm at Murree.

24th.—Violent duststorm at Hyderabad from 5-5 P.M. to 6-10 P.M. It gave a severe gale of wind.

Severe duststorm at Kurrachee from N. N. W. lasting from 8-55 P.M. to 9-30 P.M. It gave very violent winds.

25th.—Severe duststorms at Hyderabad and Bhuj.

26th.—Duststorm at Nagpur from south-east.

Weather in the Bay of Bengal and the Arabian Sea.

Fine weather, with light to moderate winds, obtained over the whole of the Bay, the winds decreasing in force northwards and being very light at the head of the Bay during nearly the whole of the month; at the entrance to the Bay, and in the neighbourhood of the equator 7° N., squalls were of occasional occurrence. For example, the ship "Palgrave" in Lat. 3° 38′ N. and Long. 85° 70′ E., at noon of the 3rd, had heavy squalls with torrents of rain. The S. S. "Kaisar-I-Hind" had heavy rain squalls on the 7th at the Ceylon coast. The ship "Bangalore" in Lat. 6° 16′ N. and Long. 84° 5′ E., on the 12th, had heavy north-west squalls; the ship "Battle Abbey" had heavy north-west squalls and heavy rain in Lat. 0° 59′ S. and Long. 91° 23′ E. on the 16th. Squalls in the south of the Bay were only experienced to the south of Lat. 8° N. (Thick squally weather was experienced at the head of the Bay on the 10th and 11th.) Hence fine weather, with light to moderate winds, prevailed over the whole of the Bay during the month, except in the extreme south, where squalls with heavy rain, chiefly from the north-west, were of occasional occurrence, and at the head of the Bay, for a brief period of 48 hours, on the 10th and 11th, when weather was thick and squally, in consequence of the prevalence of the disturbed weather in the whole of Northern India.

The weather in the Arabian sea was very similar in character. Squalls were of occasional occurrence to the south of Lat. 8° N. Between Lat. 8° N. and Lat. 25° or 26° N. weather was uniformly fine, with light to moderate north-east winds. To the north of Lat. 25° N. weather was occasionally slightly unsettled during the disturbed period of the month in Northern India. The "Baghdad" in the Persian Gulf, near Bushire, on the 6th, had heavy squalls with rain, terrific thunder and vivid lightning. The S. S. "Assyria" on the 8th, at Muscat, had heavy squalls from south, force 6. The S. S. "Assyria," and "Kilwa" had squalls in the Persian Gulf and between Muscat and Kurrachee on the 10th, 11th and 12th. Hence the weather was disturbed over the Persian Gulf and the head of the Arabian sea during the unsettled weather of the first fortnight of the month in North-Western India.

Temperature of the Air.

The distribution of temperature in India for March 1891 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. The continuous lines indicate that the temperature was in excess by the amounts indicated by the numbers given near the lines, and the broken lines that it was in defect by the amounts indicated by the numbers placed near the lines. 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 data, by means of which these charts have been prepared, are given in Table I. The mean maximum and minimum temperatures have been obtained for each station from the observations of the same number of years, *viz.* 1878 to 1888. 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 amounts which vary from month to month. But the variation of the mean daily temperatare from the normal, as determined by the use of this definition, agrees in almost all cases very closely with the variation as determined by the use of true daily means based on readings at 16 hours in addition to those 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.

The month of March was unusually cool over the greater part of India. This was partly due to the antecedent temperature conditions of February, and the excessive snowfall in the Himalayan and Afghan mountain areas, and in part to an unusual number of disturbances, large amount of cloud and abnormally heavy rainfall during the month. The reduction of temperature was shown much more largely in the day than in the night temperature.

The mean day, or maximum, temperature of the month was below the normal over the whole of India, except a small portion of Madras and Mysore and the whole of Burma, in both of which areas there was a slight excess. The deficiency exceeded 8° over a large portion of Northern India, including Upper Sind, the Punjab, the greater part of the North-Western Provinces, Behar and West Bengal, and was absolutely greatest at the following stations:—

STATION.	Actual mean maximum temperature of March 1891.	Normal mean maximum temperature of month of March.	Difference.
	°	°	°
Lahore	73·5	84·3	—10·8
Ludhiana	75·2	85·7	—10·5
Agra	82·7	92·0	— 9·3
Berhampore	83·5	93·2	— 9·7
Rawalpindi	67·8	77·2	— 9·4
Dera Ismail Khan	74·9	84·2	— 9·3
Sialkot	72·9	82·1	— 9·2

To the north of the 19° parallel of latitude and west of a line joining Chittagong, Silchar and Sibsagar, the deficiency exceeded 2°. It increased northwards from that line to a line of stations in the Gangetic plain (including Rawalpindi, Lahore, Agra, Gya, and Berhampore), which hence defined the belt of greatest deficiency of temperature in the Indo-Gangetic plain. The deficiency decreased slightly from the line in the Gangetic plain defined above to the foot of the hills. It was quite as marked at the hill stations as at the nearest plain stations, *e.g.*,

PLAINS STATION.	Variation of mean temperature of month from normal.	HILL STATION.	Variation of mean temperature of month from normal.
	°		°
Rawalpindi	—9·4	Murree	—10·2
Ludhiana	—10·5	Simla	—10·3
Bareilly	—7·3	Ranikhet	— 7·2
Jalpaiguri	—4·3	Darjeeling	— 4·3

An inspection of the chart No. I (Plate III) shows that the phenomenon of decreased day temperature, although apparently depending upon actions or causes originating over the hills, was largest in amount, not at the foot of the hills, but at some distance away, and practically near the medial line of the great Indo-Gangetic plain of Northern India.

The mean night, or minimum, temperature was below the normal, except in Burma, Madras and Mysore, but the variations were much smaller than those of the maximum temperature. They exceeded 2° in Sind, Rajputana, the Punjab, the North-Western Provinces, Behar, Chutia Nagpur, Central India and Khandeish. They were greatest in the area represented by the following stations:—

STATION.	Actual mean minimum temperature of March 1891.	Normal mean minimum temperature of March.	Variation of actual from normal.
	°	°	°
Sialkot	51·0	55·4	—4·4
Lahore	50·5	56·4	—5·9
Meerut	53·6	58·0	—4·4
Agra	58·7	62·9	—4·2
Sirsa	53·2	57·3	—4·1
Dera Ismail Khan	50·9	55·6	—4·7
Peshawar	47·4	51·9	—4·5

They were much greater at the hill stations, as is shown by the following data:—

STATION.	Variation of the mean minimum temperature of the month from the normal.	STATION.	Variation of the mean minimum temperature of the month from the normal.
	°		°
Murree	—8·9	Rawalpindi	—3·3
Simla	—6·9	Ludhiana	—3·9
Ranikhet	—6·1	Bareilly	—2·9
Darjeeling	—4·1	Jalpaiguri	— ·4
Mount Abu	—6·2	Deesa	—2·5
Quetta	—4·8	Jacobabad	—3·5

The variations of the maximum and minimum temperatures were of the same kind, although they differed in amount, and hence the mean temperature of the month was more or less below the average over the whole of India, with the exception of Madras and Mysore, in which areas and in Burma it was in excess by small amounts. The excess was less than 1°, except at the following stations:—

PROVINCE.	STATION.	Variation of mean temperature of month from the normal.
		°
Mysore	Mercara	+ 1·1
Burma	Bassein	+ 1·6
	Moulmein	+ 1·9
	Toungoo	+ 1·2

The deficiency in the mean temperature was greatest in the Punjab and Upper Sind, and decreased in amount eastwards and southwards. It exceeded 4° over the whole of the Punjab, Upper Sind, Rajputana, the North-Western Provinces, Central India, Behar, Chutia Nagpur and West Bengal. It exceeded 6° in the Punjab and Upper Sind, and was absolutely greatest at Lahore (8·4°), Ludhiana (7·2°), Dera Ismail Khan (7·2°), and Sialkot and Agra (6·8°).

The deficiency was considerably greater at the hill stations than in the adjacent plains districts. The greater deficiency in this area was due to the unusually low night

temperature at the hill stations. The following gives data for the hill stations and nearest plains stations :—

STATION.	Variation of mean temperature of the month from the normal.	STATION.	Variation of mean temperature of the month from the normal.
	°		°
Murree	—9·6	Rawalpindi	—6·6
Simla	—8·6	Ludhiana	—7·2
Ranikhet	—6·7	Bareilly	—5·1
Mount Abu	—7·6	Deesa	—3·7
Quetta	—6·3	Jacobabad	—6·0
Darjeeling	—4·2	Jalpaiguri	—3·4

The preceding remarks have shown fully the variations of the mean temperature conditions of the month from the normal. It now remains to describe a few of the more important and larger temperature waves of the month. It will be seen that these mainly depended upon the large disturbances of the month. The report for February has already shown that, in consequence of the heavy snowfall of the season in the mountain regions to the north and north-west of India, temperature was reduced very considerably below the normal over the whole of Northern India, the resultant effect being greatest on the North-West Frontier, and diminishing in amount eastwards and southwards. The same conditions continued in March and contributed largely to the reduced temperature.

The reduction of temperature below the normal, due to the excessive snowfall in the mountain districts of Northern India, and to the frequent disturbances of the cold weather type during the months of January, February, and March, reached its culmination, it may be noted, in March.

The following gives a brief description of the larger temperature changes and features of the month :—

The temperature conditions at the beginning of the month were somewhat remarkable. Temperature differed little from the normal in North-Eastern India and Burma, and was in moderate defect over the greater part of Madras. It was excessive in Central India and Rajputana, more especially at Deesa (+8·1°), Ajmere (+5·9°), and Jhansi (+5·3). There was a very large local deficiency in a portion of Upper India, which was greatest at Jacobabad (—12°) and Dera Ismail Khan (—7·6°). The following gives the mean variations in the different provinces on the 1st :—

PROVINCE.	VARIATION OF		
	Mean maximum temperature from normal.	Mean minimum temperature from normal.	Mean temperature from normal.
	°	°	°
Burma	—1·5	+0·7	—0·4
Bengal	—1·6	+1·7	+0·1
North-Western Provinces	—2·0	+3·9	+1·0
Punjab	—3·8	+4·5	+0·4
Bombay	+0·7	+2·6	+1·7
Central Provinces	+3·6	+0·9	+2·3
Guzerat and Central India	+3·7	+4·8	+4·3
Sind and Rajputana	—4·3	+3·5	—0·4
Madras	—1·4	—1·4	—1·4

Temperature increased rapidly in Sind and Southern India during the next three days, and on the 4th was more or less above the normal, except in the Punjab, the North-Western Provinces and West Bengal, where it was generally in defect by moderate amounts. The deficiency was most marked in the Punjab, in which it averaged 3°. A feeble disturbance in Central India, which gave light to moderate rain during the next twenty-four hours, caused a rapid reduction of temperature. The area of greatest deficiency of temperature moved slowly eastwards from the 7th to the 11th. The following gives the largest variations of the mean temperature of the twenty-four hours preceding 8 A.M. of the days in question, and illustrates the eastward movement of the cool area or area of greatest reduction of temperature below the normal :—

DATE.	STATION.	Variation of the mean temperature of 24 hours preceding 8 A.M. of date.
		°
7th	Lucknow	—12·6
	Allahabad	—10·9
8th	Benares	—10·5
	Patna	— 8·9
9th	Berhampore	—10·8
	Burdwan	— 9·0
10th	Cuttack	— 8·8
	Saugor Island	— 7·2

The second disturbance and storm of the month commenced in Rajputana on the 10th. This disturbance was a stationary depression, which overlay North-Western India from the 11th to the 13th, when it filled up. It gave a very general and heavy burst of rain over the whole of Northern and Central India. The reduction of temperature caused by the storm extended over the whole of Northern and Central India, and was solely determined by the rainfall.

The mean temperature of the day was from 10° to 20° below the normal over a considerable extent of country on the 11th, 12th, 13th, 14th and 15th.

The following statement gives the largest variations on each of these days :—

DATE.	STATION.	Variation of mean temperature of day from the normal.
		°
11th	Benares	—13·4
	Allahabad	—10·6
12th	Mount Abu	—14·0
	Quetta	—13·5
	Mooltan	—12·8
13th	Mount Abu	—19·9
	Neemuch	—15·7
	Agra	—15·3
14th	Ranikhet	—16·3
	Delhi	—14·9
	Agra	—13·4
15th	Hazaribagh	—10·9
	Gya	—10·5

The deficiency was throughout this period larger at the hill stations than at the neighbouring plains stations. The data given above show that the greatest reduction of temperature was on the 13th and 14th.

The provincial variations for these days are given in the following table :—

Province.	13th			14th		
	Difference of			Differences of		
	Mean maximum temperature from normal.	Mean minimum temperature from normal.	Mean temperature from normal.	Mean maximum temperature from normal.	Mean Minimum temperature from normal.	Mean temperature from normal.
	°	°	°	°	°	°
Burma	+ 1·4	—1·5	— 0·1	+ 1·6	+2·1	+ 1·9
Bengal	— 8·2	—0·2	— 4·2	—11·0	—2·4	— 6·7
North-Western Provinces.	—17·4	—4·6	—11·0	—16·4	—7·0	—11·7
Punjab	—19·0	—2·9	—11·0	—16·3	—1·3	— 8·8
Bombay	— 6·4	—4·2	— 5·3	— 6·9	—4·7	— 5·8
Central Provinces.	— 9·2	—5·6	— 7·4	—14·1	—7·1	—10·6
Guzerat and Central India.	—14·3	—7·8	—11·1	—14·3	—4·5	— 9·4
Sind and Rajputana.	—15·9	—6·6	—11·3	—12·7	—4·9	— 8·8
Madras	— 1·0	+ 1·6	+ 0·3	— 2·0	+2·7	+ 0·4

These figures show that the day temperature was very largely reduced below the normal over the whole of Northern and Central India, and that the night temperature was also in defect, but to a much smaller extent. The mean temperature of the twenty-four hours preceding 8 A.M. of the 13th of the whole area, including the North-Western Provinces, Punjab, Rajputana, Sind and Central India, was 11° below the average.

Temperature increased slowly from the 15th to the 18th in Northern and Central India. A slight disturbance, which gave light rain in the Punjab on the 18th and 19th, 20th and 21st, caused a rapid and fairly continuous fall of temperature in North-Western India. A cool wave hence advanced slowly across Northern India after the disturbed weather in Upper India passed away.

The following data illustrate its progress :—

Date.	Station.	Variation of mean temperature of the day from the normal.
		°
21st	Peshawar	—16·6
	Quetta	—13·9
	Dera Ismail Khan	—12·7
22nd	Murree	—20·4
	Lahore	—16·8
	Sialkot	—14·4
23rd	Lahore	—15·1
	Ludhiana	—14·3
	Murree	—18·4
24th	Lahore	—13·3
	Agra	—11·7
	Nowgong	—12·4
	Simla	—14·7
25th	Burdwan	—14·5
	Calcutta	—13·9
	Benares	—11·3

The 25th was the day of the most general large deficiency of temperature. The following gives the provincial variations for that day :—

Province.	Variation of		
	Mean maximum temperature from normal.	Mean minimum temperature from normal.	Mean temperature from normal.
	°	°	°
Burma	+ 2·3	+0·9	+1·6
Bengal	— 9·4	—5·6	—7·5
North-Western Provinces	—10·4	—8·2	—9·3
Punjab	—12·4	—6·0	—9·2
Bombay	— 1·8	—3·9	—2·9
Central Provinces	—10·0	—2·6	—6·3
Guzerat and Central India	— 7·2	—3·1	—5·2
Sind and Rajputana	— 8·7	—3·2	—6·0
Madras	— 1·0	+0·2	—0·4

Temperature was very largely below the normal during the remainder of the month. The following table gives the provincial variations for the last day of the month :—

District.	Variation of		
	Mean maximum from normal.	Mean minimum from normal.	Mean from normal.
	°	°	°
Burma	+2·2	—0·3	+1·0
Bengal and Assam	—3·3	—6·2	—4·8
North-Western Provinces	—8·3	—6·6	—7·5
Punjab	—2·7	—6·2	—4·5
Bombay	—0·3	—1·1	—0·7
Central Provinces	—4·7	—4·0	—4·4
Guzerat and Central India	—7·2	—9·2	—8·2
Sind and Rajputana	—3·2	—5·6	—4·4
Madras	—0·5	—1·3	—0·9

Winds.

The mean wind directions at 8 A.M. during the month are shown in Plate I by arrows flying with the wind. They are obtained by the use of Lambert's formula, in which an equal value is given to every wind. The data are given in Table I. The mean wind directions derived from the wind observations at 10 A.M. and 4 P.M. are given in the small chart, No. 4 of Plate III, by means of arrows flying with the wind. The data for these will be found in Table II, together with the normal direction as obtained from the observations of the past ten to twenty years.

Winds were unusually steady at the hill stations and were of normal strength during the month. In the Punjab, the North-Western Provinces and Behar, they were generally slightly steadier than usual, and were, on the average of the month, considerably above their mean force, and had a stronger northerly component than usual, as is shown by the following data of four representative stations :—

STATION.	Average steadiness, March 1891.	Normal steadiness, March.	Mean daily movement, March 1891.	Normal daily movement, March.
Lahore	35	33	57	73
Agra	34	39	112	109
Allahabad . . .	43	34	112	72
Patna	51	48	98	83

Winds were remarkably unsteady in Bengal. This was due to the character and number of the disturbances of the month, which gave strong south-east winds during their existence, and were followed by the extension of north-west winds from the North-Western Provinces and Behar into Bengal. The result was to give mean wind directions for the month of the Bengal stations, similar to those of the cold weather months of December and January. The following data of these stations illustrate their motion :—

STATION.	Mean direction, March 1891.	Normal direction, March.	Average steadiness, March 1891.	Normal steadiness, March.	Mean daily movement, March 1891.	Normal daily movement, March.
Burdwan . .	N 55° W	S 78° W	20	43	61	80
Calcutta . . .	N 70° W	S 32° W	21	49	74	126
Chittagong . .	N 49° W	S 54° W	22	20	71	139

In North-Western and Western India north-westerly winds prevailed over a much larger area than usual, and were on the whole steadier and stronger than usual :—

STATION.	Mean direction, March 1891.	Normal direction, March.	Average steadiness, March 1891.	Normal steadiness March.	Average daily movement, March 1891.	Normal daily movement March.
Mount Abu .	N. 31 W.	S. 85 W.	36	39	157	161
Bombay . .	N. 32 W.	N. 38 W.	61	55	300	272
Akola . .	N. 42 W.	N. 43 W.	54	44	135	104
Sholapur . .	N. 38 W.	N. 51 E.	32	9	157	181
Belgaum . .	N. 89 W.	S. 88 W.	29	8	252	279

In the Central Provinces winds were very irregular, and, at many stations, much less steady than usual. At Nagpur, Chanda and Sironcha, the westerly component of the southerly winds, which prevail in the month, was replaced by an easterly component, as is shown by the following data :—

STATION.	Mean direction, March 1891.	Normal direction, March.	Average steadiness, March 1891.	Normal steadiness March.
Nagpur	S. 37 E.	N. 20 W.	16	6
Chanda	S. 33 E.	S. 52 W.	22	9
Sironcha	S. 4 E.	S. 2 W.	54	36

In Madras and Burma winds were on the whole steadier and below their normal strength, but differed little in direction from the normal. At Port Blair the mean wind direction was N. 87°E., the normal mean being N. 56°E.

Humidity and Cloud.

The hygrometric data for 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 the minimum of the vapour tension and humidity at the same hours, and also the daily means of these elements. The hygrometric data are taken from the tables given in the *Vade Mecum*, which are 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 five to twenty 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 computed, are the means for periods varying from five to twenty-five years of the available cloud data for the same hours.

The amount of vapour in the air was either normal or slightly in defect in the Punjab, Rujputana and North-Western Provinces. Notwithstanding, in consequence of the diminished air temperature, the humidity was generally considerably above the normal. The excess was most marked at the hill stations, more especially Chakrata (+17) Murree and Chamba (+13), and at Lahore (+15) and Ajmere (+12) in the plains.

There was a slight excess of vapour at the Behar, and most Bengal stations. Humidity was hence considerably above the average, in consequence, chiefly, of diminished

temperature. The excess was greatest at Hazaribagh (+15), and Burdwan and Berhampore (+12). The amount of aqueous vapour was, on the other hand, in moderate defect in East and North Bengal and Assam.

There was a remarkable excess of aqueous vapour in the eastern districts of the Central Provinces, and in some parts of the Deccan. The following gives the most noteworthy cases:—

		Actual vapour pressure.	Normal vapour pressure.	Variation from normal.
CENTRAL PROVINCES, EAST AND SOUTH	Raipur	·487	·366	+·121
	Nagpur	·420	·332	+·088
	Chanda	·539	·402	+·137
	Sironcha	·598	·501	+·097
BOMBAY, MADRAS, DECCAN	Sholapur	·433	·325	+·108
	Secunderabad	·512	·438	+·074
	Bellary	·544	·374	+·170

The average humidity of the month was hence from 10 to 15 above the normal in those two areas.

There was, on the other hand, a considerable deficiency in the amount of aqueous vapour in the west coast districts, which was most marked at Bombay (—·103) and Ratnagiri (—·089), and extended south as far as Mangalore.

In South Madras and Burma the variation was small and unimportant.

The mean cloud amount was in excess over the whole of Northern and Southern India and the North Deccan. It was generally in defect in Burma and the west, centre, and south of the peninsula. At many stations in the Central Provinces and the Gangetic plains, the mean cloud amount was more than double the normal amount. The following table gives comparable data of this feature, and of the variation of the aqueous vapour pressure and humidity in the eleven meteorological provinces of India:—

DIVISION.	MEAN VARIATION.		CLOUD AMOUNT.	
	Aqueous vapour pressure, normal.	Humidity from normal.	Actual.	Variation from normal.
Burma Coast and Bay Islands	—·021	—3	2·9	+0·2
Assam	—·013	+3	5·0	+1·1
Bengal and Orissa	—·019	+3	4·8	+2·1
Gangetic plain and Chutia Nagpur	—·007	+9	4·2	+2·1
Upper Sub-Himalayas	—·016	+6	3·6	+0·6
Indus Valley, and N.-W. Rajputana	—·055	+1	3·9	+0·9
East Rajputana, Central India and Guzerat	—·007	+6	3·8	+1·4
Deccan	+·035	+6	2·8	+0·7
West Coast	—·049	—4	1·0	—0·8
Southern India	+·049	+5	2·9	+0·3

Rainfall.

Rainfall observations are made at upwards of 2,500 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 officer in the province, and monthly statements are published in the *Provincial Gazettes*. A statement of the rainfall of every district is telegraphed weekly to the Simla Meteorological Office by district officers, and a summary of this information is published in the *Gazette of India*. The charts, illustrating the distribution of rainfall in March 1891, 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. 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 160 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 indicating the rainfall. Over a considerable portion of the country no rain fell. The line of rainfall is indicated by two parallel lines separated by a short distance, one continuous and the other dotted; the latter facing the districts of no rainfall.

The second chart illustrating the distribution of the rainfall of the month is given in Plate V, and shows by figures the variation of the mean actual rainfall of the month from the normal rainfall in each of the 51 meteorological districts into which India and Burma have been divided for purposes of comparing crops and rainfall. The data of this chart are deduced from the rainfall information telegraphed by district officers, of which a summary is given in the following table, and the actual figures utilized are those given in the last column. The numbers given in the centre of each district are the variations of the actual mean rainfall of the district from the normal mean rainfall. A number given in a corner of each district in small slanting figures serves as an index, by means of which, on referring to the list of districts at the foot of the chart, the name of the district can be at once ascertained.

March is usually one of the driest months of the year. During the previous three months rainfall in Northern India is almost exclusively due to the class of disturbances known as cold weather cyclonic storms. These storms are also of occasional occurrence in March, but are rare in April and May. During these months the chief disturbances are due to the local thermal conditions of India itself, and the accompanying rainfall occurs chiefly as thundershowers or during duststorms. The only area which is liable to moderately heavy rain is East Bengal and Assam, where the hot weather rains usually begin first, and are most severe. Over the greater part of Northern India, including Behar, the North-Western Provinces and Oudh, the South and Central Punjab, Rajputana, Central India,

the greater part of the Berars, the Central Provinces, Bombay, Sind and the greater portion of the Deccan, the normal rainfall is less than half an inch, and over West Rajputana, Kathiawar, Guzerat, Khandeish and Konkan is less than a tenth of an inch.

The rainfall over the whole of Northern India and some parts of Central India in March 1891 was abnormally heavy. In Behar, Chutia Nagpur and the eastern districts of the North-Western Provinces it occurred most unseasonably, just at the period when the greater part of the wheat crop was lying out in the field, and it very considerably reduced the value of that crop in these areas.

The following gives a brief account of the chief periods of rainfall so far as it can at present be compiled from the available rain records :—

The first period of rainfall was from the 5th to the 7th. A local depression formed in the eastern districts of the Central Provinces on the 5th and 6th, which drifted eastwards towards Bengal on the 7th and filled up on the 8th. The rainfall was hence chiefly due to easterly winds from the head of the Bay, and was heaviest in Bengal, Behar, and Chutia Nagpur. Rain was also received in moderate amounts generally in the North-Western Provinces, the Punjab and eastern districts of the Central Provinces. The following table gives the average daily and total rainfall during the disturbance :—

District.	Average rainfall of 24 hours preceding 8 A.M. of			Total average rainfall of 5th to 7th.
	5th	6th	7th	
Bengal	0·33	0·09	0·46	0·88
Assam	...	0·12	0·44	0·56
Behar	.	0·05	0·71	0·76
Chutia Nagpur	0·08	0·73	0·85	1·66
Oudh	...	...	0·54	0·54
North-Western Provinces	...	0·05	0·21	0·26
Central Provinces	...	0·03	...	0·03
Punjab	...	0·01	...	0·01

The heaviest falls in twenty-four hours during this disturbance were the following :—

Province.	District.	Station.	Amount of rainfall.
ORISSA	Balasore	Baripodah	3·82
BEHAR	Monghyr	Gogri	3·47
	Sonthal Pergunnahs.	Nya Doomka	2·78
CHUTIA NAGPUR	Lohardugga	Ranchee	3·21
	"	Garwah	2·75
	Manbhoom	Jhalda	7·12

The second period of disturbance and general rainfall extended from the 11th to the 14th. This was due to a depression which appeared in Sind and West Rajputana, and remained nearly stationary during the next two days, when it filled up and disappeared. It gave rise to an unusually strong indraught of moist winds up the Gangetic plain from the head of the Bay, which continued for nearly 48 hours after the depression had disappeared or filled up. The rainfall was exceptionally heavy in West Bengal, Behar, Oudh and Chutia Nagpur, and inflicted much injury upon the crops in Behar.

The following shows the distribution and character of the rainfall day by day during the disturbance :—

District.	Average rainfall of 24 hours preceding 8 A.M. of				Total rainfall of 11th to 14th.
	11th	12th	13th	14th	
Assam	..	0·03	0·17	0·80	1·00
Bengal	0·04	0·26	0·34	0·96	1·60
Behar	0·02	0·31	1·17	0·09	1·59
Chutia Nagpur	0·02	0·31	0·07	0·08	0·48
Oudh	...	0·87	1·02	...	1·89
North-Western Provinces	0·05	0·32	0·91	0·09	1·37
Punjab	0·02	0·45	0·44	0·18	1·09
Central Provinces	0·04	0·06	0·07	...	0·17
Rajputana	0·17	0·34	0·50	...	1·01

Rainfalls in twenty-four hours exceeding two inches were registered at a large number of stations in Bengal. The following gives rainfalls in 24 hours exceeding 3 inches :—

Province.	District.	Station.	Date on which registered.	Amount.
BENGAL	Nuddea	Kooshtea	13th	3·20
	Jessore	Jhenidah	14th	4·22
		Magoorah	14th	3·70
	Moorshedabad	Patkabari	12th	3·10
BEHAR	Patna	Dinapore	12th	3·50

When the disturbance in Northern India was passing away weather became slightly unsettled in Southern India, and thunderstorms occurred on the 14th, 15th, 16th and 17th over the greater part of Travancore and South Madras which gave fairly general and moderate rain.

During this period a depression of the cold weather type advanced from Beluchistan across Upper India to the North-Western Provinces Himalayas. It gave moderate general rain to Beluchistan and the Punjab. The following gives average data :—

District.	Average rainfall of 24 hours preceding 8 A.M. of			Total rainfall of 15th to 17th.
	15th	16th	17th	
Beluchistan	0·01	0·04	0·11	0·16
Punjab	0·02	0·03	0·17	0·22

A brief period of fine weather succeeded and lasted until the 21st, when weather became again unsettled, the disturbance being of the ordinary hot weather type. Orissa, South-West Bengal, Chutia Nagpur and the eastern districts of the Central Provinces received daily thundershowers from the 21st to the 25th. Travancore and South Madras had a series of thundershowers from the 26th to the 27th, which gave fairly general and light rain. It is

remarkable that each disturbance of the month in Northern India was followed by a shorter disturbance and fairly general rain in the extreme south of India. Whether this is more than a mere coincidence can at present only be surmised, but the examination of the complete rainfall data of India in future will throw much light on such matters.

The following table gives the rainfall data of the 51 meteorological areas into which the empire is divided for the month of March. The variations from the normal given in the last column are shown in Plate V, a reference to which will indicate at a glance the chief features of the variation of the rainfall of the month from the normal :—

Province.	Division.	March 1891. Average actual rainfall of division for week ending 7th.	Average actual rainfall of division for week ending 14th.	Average actual rainfall of division for week ending 21st.	Average actual rainfall of division for week ending 28th.	Average actual rainfall of division for (29th to 31st) March.	Total actual rainfall during the month.	Normal rainfall during month.	Variation.
		Inches.	Inches.	Inches.	Inches.	Inches.			
Burma	Tenasserim	0	0	0	0·06	0	0·06	0·93	— 0·87
	Lower Burma	0	0	0	0	0	0	0·26	— 0·26
	Central do.	0	0	0·07	0	0	0·07	0·16	— 0·09
	Upper do.	0	0·02	0	0	0·01	0·03	?	?
	Arakan	0	0·36	0·66	0	0	1·02	0·31	+ 0·71
Bengal and Assam	Eastern Bengal	0·36	1·35	0·48	0	0·01	2·20	2·67	— 0.47
	Assam (Surma)	0·73	1·42	0·90	0·07	0	3·12	9·77	— 6 65
	Do. (Brahmaputra)	1·04	0 99	0·46	0·34	0·04	2 87	4·28	— 141
	Deltaic Bengal	1·35	2·08	0·38	0 22	0·03	4·06	1·90	+ 2 16
	Central do.	2·11	1·73	0·33	0·11	0	4·28	0·93	+ 3 35
	North do.	0·99	1·37	0 02	0	0	2·38	1·74	+ 0 64
	Orissa	0·76	2·66	0·20	0·52	0	4·14	1·03	+ 3 11
	Chutia Nagpur	2·61	1·77	0·36	0·54	0	5·28	1·00	+ 4·28
	Behar (South)	1·11	1·72	0	0	0	2·83	0·33	+ 2·50
	Do. (North)	0·67	1·50	0 02	0	0	2·19	0 38	+ 1·81
North-Western Provinces and Oudh.	North-Western Provinces (East)	0·41	0·53	0	0·07	0	1·01	0·24	+ 0·77
	Oudh (South)	0·29	1·65	0·04	0·01	0	1·99	0·32	+ 1·67
	Do. (North)	0·35	1·56	0	0	0	1·91	0·45	+ 1·46
	North-Western Provinces (Central)	0·13	1·33	0	0	0	1·46	0·30	+ 1·16
	Do. Do. (West)	0·07	0·87	0	0	0	0·94	0·37	+ 0·57
	Do. Do. (Submontane)	0·15	1·99	0	0·01	0	2·15	0·93	+ 1·22
Punjab	Punjab (South)	0	1·70	0·28	0	0	1·98	0·46	+ 1 52
	Do. (Central)	0·05	1·63	0·09	0·06	0	1·83	0·46	+ 1 37
	Do. (Submontane)	0	1·78	0·24	0·07	0	2·09	0·99	+ 1·10
	Do. (Hill Districts)	0·11	1·06	0·51	0·94	0	2·62	2·69	— 007
	Do. (North-West)	0·15	1·08	1·32	0·21	0·07	2·83	1·89	+ 094
	Do. (West)	0·05	0·45	0·36	0 08	0·05	0·99	0·62	+ 037
Bombay and Malabar Coast Districts (Madras).	Malabar	0·05	0·34	0·77	0·59	0·06	1·81	1·04	+ 0·77
	Madras (South Central)	0	0·23	0·26	0	0	0·49	1·21	— 0·72
	Coorg	0·13	0·28	0·58	0	0	0·99	0·99	0
	Mysore	0	0·12	0·52	0	0	0·64	0·43	+ 0·21
	Konkan	0	0·05	0·23	0	0	0·28	0·05	+ 0·23
	Bombay Deccan	0	0	0·49	0	0·01	0·50	0·23	+ 0·27
	Hyderabad (North)	...	...	...	...	...	...	...	...
	Khandeish	0	0	0·02	0	0	0·02	0·06	— 0·04
Central Provinces and Berar.	Berar	0	0·03	0	0·05	0·07	0·15	0·35	— 0·20
	Central Provinces (West)	0·07	0·11	0	0·14	0·09	0·41	0·28	+ 0·13
	Do. (Central)	0·08	0·39	0·06	0·21	0·17	0·91	0·50	+ 0·41
	Do. (East)	0·34	1·67	0·37	1·48	0·10	3·96	0·66	+ 3·30
Bombay (North)	Guzerat	0	0·04	0	0	0	0·04	0	+ 0·04
	Kathiawar	0	0·04	0	0·02	0	0·06	0·11	— 0·05
	Sind	0·04	0·21	0·08	0·15	0·05	0·53	0·22	+ 0·31
Rajputana and Central India.	Central India (East)	0·01	0·14	0	0	0	0·15	0·12	+ 0·03
	Rajputana (East), Central India (West)	0	0·95	0	0	0	0·95	0·15	+ 0·80
	Rajputana (West)	0	0·15	0	0	0	0·15	0·05	+ 0·10
Madras	East Coast (North)	0·12	0·66	0·87	0·20	0·01	1·86	0·50	+ 1·36
	Do. (do.) (a)	0·20	0·65	0 80	0·45	0·05	2·15	?	?
	Hyderabad (South)	0	0	0·53	0	0	0 53	0·59	— 0·06
	Madras (Central)	0	0·12	0·03	0·01	0	0·16	0 32	— 0·16
	East Coast (Central)	0	0·17	0	0	0	0·17	0·25	— 0·08
	Do. (South)	0	0·15	0·01	0	0	0·16	0·68	— 0·52
	Madras (South)	0	1·03	1·27	0·43	0·03	2·76	1·10	+ 1·66

The total rainfall of the month was practically *nil* in Burma and Tenasserim, Khandeish, Guzerat and Kathiawar. It was very considerably in defect in Assam, where the spring rainfall is of much importance for the tea crop.

The following gives data :—

DIVISION.	DISTRICT.	Actual rainfall during the month.	Normal rainfall of month.	Variation from normal.
ASSAM	Surma	3·12	9·77	—6·65
	Brahmaputra	2·87	4·28	—1·41

Hence the Silchar district of Assam received less than one-third of its normal amount. There was also a slight deficiency in some parts of Madras.

Rainfall was more or less in excess over the whole of India, with the exception of the areas mentioned above. The excess was most marked in Orissa, Behar, Chutia Nagpur, Bengal, the North-Western Provinces and Oudh, and the eastern districts of the Central Provinces. It was also moderately large in South Madras and the Punjab. The following gives data for these areas:—

DISTRICT.	RAINFALL.		
	Actual during the month.	Normal of month.	Variation from normal.
Chutia Nagpur	5·28	1·00	+4·28
Orissa	4·14	1·03	+3·11
Central Provinces (East)	3·96	0·66	+3·30
Behar	2·51	0·35	+2·16
Bengal	3·57	1·52	+2·05
North-Western Provinces	1·68	0·45	+1·23
Punjab	1·94	0·88	+1·06
South Madras	2·76	1·10	+1·66

This shows that the area, including Behar, Chutia Nagpur, Orissa, and the eastern districts of the Central Provinces, received from four to six times the normal rainfall of the month. The rainfall was exceptionally heavy, and such as in fact has not occurred for many years. It was also most inopportune in a part of the area affected (more especially Behar), as it occurred in the midst of the wheat harvest, when a large portion of the crops was lying cut over the ground.

Explanation of Tables.

Table I gives an abstract of the meteorological observations at 8 A.M. daily, taken at 154 stations in India during the month of January 1891.

In this table the observing stations are grouped under two sets of divisions. According to the first arrangement India and Burma are divided into eleven large meteorological areasor provinces. These divisions have been selected in consultation with the Medical Department. The climatic conditions of each area are fairly uniform, and they hence are presumed to form suitable areas for the discussion of the relations between disease and meteorology. The names of these divisions are printed in bold type, and the mean variations of the more important meteorological data, more especially temperature, are given opposite to each in prominent figures.

Each of these larger divisions is subdivided into smaller meteorological areas, of which there are 51 in all. This subdivision was made in consultation with the Revenue and Financial Departments. In each of these smaller areas the distribution and character of the rainfall are fairly uniform, and the staple crops in each are hence the same. This subdivision will, it is hoped, serve to make a more exact comparison between crops, prices and rainfall than has been hitherto possible.

The headings of the columns in the great majority of cases explain themselves. The figures in the third column "variation from normal" are obtained by taking in each case the difference between the mean actual barometer (reduced for temperature, but not to sea-level or constant gravity) and the normal means obtained from the observations of the eleven years' period, 1878-88.

The "mean daily temperature" is assumed in Table I to be the mean of the maximum and minimum. It is chiefly utilized in order to obtain the mean variation of the temperature of the month from the normal.

In obtaining the figures for the column headed "Number of rainy days," a rainy day is assumed to be one on which a fall of a tenth of an inch or upwards has been recorded. A fall of less than a tenth of an inch is practically of no value for agricultural purposes in India, and it has not been found possible to secure the accurate record of rainfalls of less than a tenth of an inch at a great majority of the rainfall-recording stations.

Table II gives an abstract of the observations recorded at 10 A.M. and 4 P.M. at 86 second class observatories throughout India, Burma and the adjacent regions. This table is intended in part to supplement Table I, and hence information given in full in the latter table, as for example rainfall, is not included in Table II. This table is intended to give for the month, so far as is possible, all the information furnished hitherto in the Appendix A of the Annual Report on the Meteorology of India. The methods of calculating the means have been very fully explained in the Annual Reports, to which the reader is referred for

complete information. The data of the mean daily pressure, the figures of which are given in the sixth column, are the means of the 10 and 16 hours' observations, with corrections obtained from a comparison of the 10 and 16 hours' observations of the same or a neighbouring observatory, with a series of hourly observations at the same observatory.

The mean temperature is calculated by the formula $\text{mean} = \frac{\textit{maximum} + \textit{16 hours} + 2\ \textit{minimum}}{4}$ by applying a constant correction for each month, derived from the hourly observations of the same or of a neighbouring station.

The mean daily vapour tension and humidity are the averages of the values for 10 A.M., 4 P.M., and the minimum readings and the mean daily cloud is the average of the mean amounts for 10 and 16 hours.

The mean wind direction for each month is the trigonometrical resultant of the winds given under each of the eight cardinal points, and is calculated by means of Lambert's formula, in which an equal weight or value is given to every wind.

It should be noted that in the preceding discussion, in speaking of the maximum, minimum or mean temperature, the total amount of wind or the rainfall of a given day, as for example the 5th, the maximum, &c., of the 24 hours preceding 8 A.M. of the 5th, is meant. This definition has been adopted to avoid confusion. As the observations are taken at 8 A.M., a part of them refer to 8 A.M. of that day and a part to the previous twenty-four hours, and, therefore, including a portion of the previous civil day. It is found most convenient to use the same day to designate and define both classes of observations.

Table

Abstract of observations taken at 8 A.M., at 154

Meteorological Province or District.	Station.	Height of Station 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.
Burma Coast and Bay Islands.		...	...	−·014	...	...	...	...	...	...	...	93·0	+0·9	71·9	+1·0	82·5	+1·0	21·4	...	...	...	...	30·1
Bay Island	Port Blair	61·16	29·897	?	29·889	29·958	23rd	29·812	31st	·146	80·9	91·1	?	77·3	?	84·2	?	13·8	93·8	31st	73·9	1st & 2nd.	19·9
Tenasserim	Mergui	96·27	29·862	?	29·890	29·999	6th	29·732	27th	·267	80·1	91·2	?	69·6	?	80·4	?	21·6	94·1	8th	66·5	3rd	27·6
	Tavoy	26·26	29·968	?	29·927	30·024	23rd	29·885	31st	·139	76·9	93·2	?	70·3	?	81·8	?	22·9	96·2	30th	65·2	2nd	31·0
	Moulmein	93·79	29·870	+·010	29·903	29·939	4th	29·782	31st	·157	79·5	95·3	+1·5	74·4	+2·3	84·9	+1·9	20·9	98·4	27th	65·9	13th	32·5
	Toungoo	181·1	29·750	−·013	29·877	29·840	4th	29·657	31st	·183	76·7	97·2	−0·6	70·1	+3·0	83·7	+1·2	27·1	102·2	24th & 31st.	63·2	16th	39·0
Lower Burma	Rangoon	40·69	29·912	−·022	29·892	29·994	12th	29·815	31st	·179	75·1	97·1	+0·6	71·7	+0·8	84·4	+0·7	25·4	101·2	27th	66·8	1st	34·4
	Bassein	21	29·932	−·013	29·892	29·992	7th	29·824	31st	·168	77·2	95·6	+1·5	71·3	+1·2	83·5	+1·4	24·3	99·7	25th & 26th.	67·9	3rd, 10th & 18th.	31·3
	Diamond Island.	41	29·922	−·023	29·900	29·974	12th	29·822	31st	·152	80·1	87·0	+1·6	72·2	−3·0	79·6	−0·7	14·8	91·3	6th	69·6	11th	21·7
Arakan	Akyab	20·44	29·942	−·024	29·907	30·024	8th	29·826	31st	·198	74·1	89·6	+0·8	70·6	+1·7	80·1	+1·3	19·0	100·1	30th	67·1	1st, 3rd & 8th.	33·0
Burma, Inland		...	...	−·005	...	...	...	...	...	...	...	94·4	+0·2	65·0	+0·5	79·7	+0·4	29·4	...	...	...	...	42·2
Central Burma	Thayetmyo	134	29·796	−·005	29·875	29·868	5th	29 710	30th	·158	78·5	100·0	+0·2	66·5	+0·5	83·3	+0·4	33·5	104·2	24th	58·8	17th	45·4
Upper Burma	Mandalay	?	29·715	?	?	29·839	4th	29·586	21st	·253	77·5	96·4	?	69·1	?	82·7	?	27·3	101·5	23rd, 24th & 29th.	62·3	1st	39·2
	Kindat	?	29·561	?	?	29·694	6th	29·455	31st	·239	68·6	93·7	?	64·5	?	79·1	?	29·2	99·8	25th	58·0	17th	41·8
	Bhamo	?	29·534	?	?	29·626	4th	29·437	31st	·189	67·3	87·3	?	59·7	?	73·6	?	27·6	94·1	23rd & 30th	51·6	16th	42·5
Assam		...	...	+·009	...	...	...	...	...	...	...	80·7	−2·9	61·6	−1·1	71·2	−2·0	19·1	...	...	...	...	31·9
Assam (Surma)	Silchar	104·3	29·875	+·013	29·934	29·961	6th	29·799	31st	·162	68·2	84·1	−1·0	62·9	−0·8	73·5	−0·8	21·2	91·7	29th	57·3	17th	34·4
Brahmaputra	Sibsagar	333	29·628	−·011(?)	29·929	29·711	5th	29·521	20th	·190	62·9	76·8	−2·4	59·6	−0·5	68·2	−1·5	17·2	85·1	31st	55·5	16th	29·6
	Dhubri	115·34	29·836	+·025	29·910	29·954	6th	29·717	20th	·237	66·7	81·2	−5·4	62·4	−2·3	71·9	−3·9	18·8	90·2	29th	58·6	4th	31·6
Bengal and Orissa		...	...	+·029	...	...	...	...	...	...	...	83·9	−5·6	66·3	−1·2	75·3	−3·4	18·1	...	...	...	...	31·4
East Bengal	Chittagong	86·7	29·888	+·005	29·925	29·967	4th	29·815	31st	·152	73·1	86·9	+0·9	68·3	+0·6	77·6	+0·8	18·6	92·7	30th & 31st	63·3	12th	29·4
	Lungleh	?	?	?	?	?	?	?	?	?	64·8	68·9	?	?	?	?	?	?	75·9	28th	?	?	?
	Noakholly	42·73	29·936	?	29·927	30·034	4th	29·861	20th & 28th.	·173	73·4	84·0	?	66·5	?	75·3	?	17·5	91·0	29th	62·0	31st	29·0
	Comillah	34·75	29·942	?	29·926	30·018	4th	29·872	31st	·146	73·0	84·9	?	65·7	?	75·3	?	19·2	91·3	30th & 31st.	60·9	9th, 16th & 31st.	30·4
	Serajgunj	46·37	29·910	?	29·907	29·994	4th & 8th	29·834	20th	·160	69·7	83·1	?	62·5	?	72·8	?	20·6	92·0	29th	57·1	16th	34·9
	Dacca	21·7	29·946	+·031	29·916	30·060	24th	29·874	2nd	·186	72·2	84·9	−5·3	66·9	−1·7	75·9	−3·5	18·0	92·1	29th	62·8	7th, 9th & 12th.	29·3
	Burrisal	12	29·958	+·037	29·916	30·048	4th	29·875	14tn	·173	?	?	?	?	?	?	?	?	?	?	?	?	?
	Mymensingh	55·18	29·906	+·025	29·916	29·994	6th	29·825	20th	·169	69·0	81·7	−5·0	63·2	+0·8	72·5	−2·1	18·5	90·6	29th	57·8	31st	32·8
Deltaic Bengal	Furreedpore	39	29·939	?	29·927	30·019	4th & 6th	29·869	14th	·150	71·3	82·8	?	66·3	?	74·5	?	16·5	92·0	29th	61·5	16th	30·5
	Jessore	33·29	29·934	+·035	29·915	30·030	24th	29·867	1st	·163	72·2	84·5	−8·4	67·7	−0·8	76·1	−4·6	16·8	93·7	29th	63·0	12th	30·7
	Calcutta	21·38	29·949	+·038	29·916	30·038	7th & 8th	29·880	20th	·158	73·3	84·8	−5·9	67·9	−2·0	76·4	−4·0	16·9	91·5	23rd	62·8	12th	28·7
	Saugor Island	25·3	29·939	+·029	29·909	30·029	7th	29·861	20th	·168	76·2	83·7	−3·8	72·3	−2·8	78·0	−3·3	11·4	90·7	29th	65·4	7th	25·3
	Kishnaghur	46·64	29·914	?	29·911	30·001	8th & 24th.	29·845	1st	·156	71·8	84·4	?	65·6	?	75·0	?	18·8	92·9	29th	57·8	7th	35·1
	Midnapore	148·88	29·818	?	29·917	29·998	2nd	29·753	20th	·245	73·6	87·4	?	68·2	?	77·8	?	19·2	95·3	3rd	63·2	5th & 6th.	32·1
Central Bengal	Bankoora	300	29·638	?	29·896	29·729	7th	29·558	20th	·171	71·3	86·0	?	67·0	?	76·5	?	19·0	95·4	23rd	62·7	6th, 7th & 15th	32·7
	Raneegunge	333	29·629	?	29·917	29·715	7th	29·557	20th	·158	70·1	84·7	?	65·6	?	75·2	?	19·1	92·9	29th	59·5	7th	33·4
	Burdwan	99·09	29·873	+·044	29·922	29·973	8th	29·783	20th	·190	71·4	85·3	−8·6	66·8	−1·8	76·0	−5·2	18·5	93·6	29th	62·4	15th	31·2

I.

stations in India, Burma, &c., in March 1891.

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 March.	Normal rainfall for period 1st to 31st March.	Variation from normal of period.	Station.	Meteorological Province or District.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·29	0·49	−0·20	...	...	...	**Burma Coast and Bay Islands.**	
...	8	6	4	2	...	3	4	3	4	4	0	83	·875	3·2	0	...	...	0	0·49	−0·49	0	0·49	−0·49	Port Blair .	Bay Island.
...	3	2	...	...	2	8	...	16	3	2	+50	81	·826	1·7	3	...	...	1·17	2·50	−1·33	1·17	2·50	−1·33	Mergui .	Tenasserim.
25	2	...	...	...	...	...	...	4	2	?	?	84	·785	0·3	1	...	...	0·18	?	?	0·18	?	?	Tavoy.	
...	1	3	9	7	5	3	2	1	4	3	+33	78	·792	0·7	0	...	...	0	0·41	−0·41	0	0·41	−0·41	Moulmein.	
8	2	1	...	14	6	...	...	...	3	3	0	74	·692	2·9	1	...	...	0·25	0·04	+0·21	0·25	0·04	+0·21	Toungoo.	
...	2	...	...	...	1	9	14	5	5	5	0	87	·754	1·0	0	...	...	0	0·07	−0·07	0	0·07	−0·07	Rangoon .	Lower Burma.
7	...	...	...	...	...	...	1	23	7	5	+40	84	·789	2·4	0	...	...	0	0·03	−0·03	0	0·03	−0·03	Bassein.	
...	12	...	...	...	...	...	2	17	6	8	−25	75	·762	2·3	0	...	...	0	0	0	0	0	0	Diamond Island.	
...	16	14	...	...	...	...	...	1	4	4	0	79	·662	1·4	2	...	...	1·04	0·37	+0·67	1·04	0·37	+0·67	Akyab .	Arakan.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·22	?	?	...	...	...	**Burma, Inland.**	
...	1	...	1	3	7	5	4	10	7	5	+40	57	·560	0·8	1	...	...	0·65	0	+0·65	0·65	0	+0·65	Thayetmyo .	Central Burma.
7	2	5	2	6	...	3	2	4	?	?	?	54	·501	5·4	0	...	...	0·02	?	?	0·02	?	?	Mandalay .	Upper Burma.
6	4	5	...	...	...	...	1	5	5	?	?	89	·625	0·2	0	...	...	0	?	?	0	?	?	Kindat.	
...	...	6	...	2	...	1	1	21	?	?	?	77	·514	4·2	1	...	...	0·19	?	?	0·19	?	?	Bhamo.	
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3·37	5·58	−2·21	...	...	...	**Assam.**	
20	2	2	4	3	...	...	...	...	1	3	−67	86	·592	6·8	8	...	...	4·11	9·29	−5·18	4·11	9·29	−5·18	Silchar .	Assam (Surma).
2	1	14	2	6	2	2	...	2	2	3	−33	95	·550	8·2	10	...	...	3·76	4·73	−0·97	3·76	4·73	−0·97	Sibsagar .	Brahmaputra.
1	4	8	6	4	...	7	...	1	6	6	0	81	·529	3·6	4	...	...	2·25	2·72	−0·47	2·25	2·72	−0·47	Dhubri.	
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3·47	1·71	+1·76	...	...	...	**Bengal and Orissa.**	
3	2	14	5	2	1	...	1	3	3	6	−50	81	·662	4·3	2	...	...	1·73	2·87	−1·14	1·73	2·87	−1·14	Chittagong .	East Bengal.
Not recorded.												74	·460	...	4	...	...	1·15	?	?	1·15	?	?	Lungleh.	
3	8	6	5	...	3	3	2	1	4	?	?	84	?	1·1	4	...	...	3·01	2·85	+0·16	3·01	2·85	+0·16	Noakholly.	
...	6	6	6	4	6	3	...	...	2	?	?	84	?	2·2	4	...	...	2·51	3·07	−0·56	2·51	3·07	−0·56	Comillah.	
...	...	2	3	2	7	11	5	1	2	?	?	82	?	4·0	6	...	...	2·15	?	?	2·15	?	?	Serajgunj.	
4	2	5	1	5	3	7	2	2	4	5	−20	82	·641	6·3	5	...	...	2·68	3·74	−1·06	2·68	3·74	−1·06	Dacca.	
12	4	5	...	...	1	7	1	1	3	?	?	?	?	4·4	5	...	...	2·58	2·51	+0·07	2·58	2·51	+0·07	Burrisal.	
1	1	4	11	8	2	2	1	1	3	?	?	83	·591	4·3	4	...	...	2·02	2·19	−0·17	2·02	2·19	−0·17	Mymensingh.	
11	2	3	2	2	4	6	...	1	3	?	?	85	?	4·0	4	...	...	1·94	2·78	−0·84	1·94	2·78	−0·84	Furreedpore .	Deltaic Bengal.
14	2	...	3	2	1	3	1	5	2	3	−33	86	·711	6·5	7	...	...	3·42	2·87	+0·55	3·42	2·87	+0·55	Jessore.	
9	3	1	2	1	2	7	3	3	3	5	−40	83	·676	4·5	8	...	...	3·94	1·40	+2·54	3·94	1·40	+2·54	Calcutta.	
...	4	3	2	3	7	5	4	3	11	12	−8	87	·794	6·1	6	...	...	2·89	1·55	+1·34	2·89	1·55	+1·34	Saugor Island.	
...	1	3	4	3	4	5	6	5	5	?	?	79	?	5·6	6	...	...	3·53	1·25	+2·28	3·53	1·25	+2·28	Kishnaghur.	
1	6	9	...	2	8	4	1	...	8	?	?	77	?	2·7	9	...	...	7·93	1·41	+6·52	7·93	1·41	+6·52	Midnapore.	
8	3	1	3	1	...	3	7	5	4	?	?	73	?	5·0	6	...	...	3·36	1·41	+1·95	3·36	1·41	+1·95	Bankoora .	Central Bengal.
...	3	4	1	2	2	2	6	11	3	?	?	75	?	4·4	6	...	...	6·73	?	?	6·73	?	?	Raneegunge.	
7	2	...	1	2	3	5	7	4	3	3	0	74	·568	4·9	10	...	...	6·91	1·37	+5·54	6·91	1·37	+5·54	Burdwan.	

Table

Abstract of observations taken at 8 A.M., at 154 stations

Meteorological Province or District.	Station.	Height of Station 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.
Central Bengal —*contd.*	Nya Doomka	490	29·446	?	29·909	29·547	7th	29·375	13th	·172	70·2	83·9	?	63·8	?	73·9	?	20·1	93·6	28th	59·0	8th & 15th	34·6
	Berhampore	66·45	29·885	+·029	29·902	29·980	7th	29·818	20th	·162	69·4	83·5	−9·7	64·7	−1·4	74·1	−5·6	18·8	92·2	29th	60·7	8th	31·5
	Rampore Bauleah.	70	29·882	?	29·903	29·976	7th	29·815	20th	·161	70·2	82·1	?	64·1	?	73·1	?	18·0	91·3	29th	59·7	4 dates	31·6
	Maldah	80	29·865	?	29·899	29·961	7th	29·782	20th	·179	70·0	83·7	?	61·4	?	72·4	?	22·3	91·8	28th	56·5	15th	35·3
	Bogra	61·48	29·871	+·036	29·886	29·962	7th	29·790	20th	·172	69·2	82·5	−7·5	62·3	−2·1	72·4	−4·8	20·2	91·6	29th	57·5	16th	34·1
North Bengal	Dinagepore	117·59	29·822	+·005	29·897	29·931	7th	29·721	20th	·210	68·3	83·1	−7·4	61·4	−0·2	72·3	−3·8	21·7	91·6	21st	56·4	17th	35·2
	Rungpore	123	29·836	?	29·917	29·948	7th	29·726	20th	·222	67·1	82·7	?	59·7	?	71·2	?	23·0	90·6	21st	54·8	17th	35·8
	Jalpaiguri	283·7	29·659	+·036	29·908	29·778	7th	29·543	20th	·235	65·5	81·2	−4·3	57·8	−2·4	69·5	−3·4	23·4	89·9	29th	52·6	14th	37·3
Orissa	Balasore	56·15	29·908	+·030	29·912	30·020	6th	29·832	20th	·188	74·4	86·2	−4·4	69·0	−1·4	77·6	−2·9	17·2	92·4	28th	63·7	6th	28·7
	False Point	20·60	29·938	+·012	29·901	30·024	6th	29·864	20th	·160	77·3	85·0	−2·9	71·8	−0·5	78·4	−1·7	13·2	89·0	29th & 30th	65·5	10th	23·5
	Cuttack	80	29·888	+·037	29·912	29·980	6th	29·817	20th	·163	76·5	91·1	−6·1	72·4	−0·5	81·7	−3·3	18·7	98·4	30th	65·8	10th	32·6
	Shortt's Island	?	29·943	?	?	30·033	6th	29·872	20th	·161	78·2	84·0	?	73·8	?	78·9	?	10·2	89·2	22nd, 28th & 31st.	65·7	12th	23·5
	Pooree	11·99	29·947	?	29·900	30·028	6th	29·888	20th	·140	77·6	84·7	?	73·8	?	79·3	?	10·9	89·2	29th	60·6	10th	28·6
Gangetic Plain and Chutia Nagpur.		...	...	+·032	...	...	...	...	...	...	...	83·7	−7·7	60·5	−2·9	72·1	−5·3	23·2	...	...	...	...	39·1
Chutia Nagpur	Hazaribagh	2007·12	27·919	+·011	29·915	28·007	7th	27·848	13th	·159	67·2	82·6	−6·4	60·8	−3·1	71·7	−4·8	21·8	90·3	27th	54·5	7th & 15th	35·8
	Ranchee	2128·14	27·800	?	29·912	27·881	7th	27·739	13th	·142	67·1	80·2	?	59·4	?	69·8	?	20·8	86·5	23rd & 31st	48·9	6th	37·6
	Chybassa	760	29·183	?	29·908	29·265	7th	29·122	20th	·143	71·1	86·7	?	66·6	?	76·7	?	20·1	97·3	23rd	61·0	6th	36·3
Behar (South)	Gya	37·45	29·582	+·039	29·923	29·728	7th	29·503	21st	·225	70·2	85·7	−8·5	64·1	−2·2	74·9	−5·4	21·6	95·7	28th	58·7	7th	37·0
	Dehree	351·14	29·600	?	29·915	29·760	7th	29·518	21st	·242	71·5	86·0	?	63·6	?	74·8	?	22·4	94·8	28th	57·0	8th	37·8
	Patna	182·84	29·760	+·027	29·901	29·911	7th	29·686	20th	·225	70·3	84·0	−7·4	61·4	−2·2	72·7	−4·8	22·6	94·4	28th	56·7	9th	37·7
	Arrah	190·02	29·752	?	29·900	29·896	7th	29·677	21st	·219	68·4	84·7	?	60·5	?	72·6	?	24·2	94·4	28th	55·6	4th	38·8
	Buxar	239·22	29·708	?	29·911	29·861	7th	29·611	21st	·250	68·2	84·0	?	61·5	?	72·8	?	22·5	92·4	27th	55·4	14th	37·0
Behar (North)	Purneah	125	29·821	+·034	29·904	29·946	7th	29·721	20th	·225	65·6	82·3	−8·3	58·6	−1·9	70·4	−5·1	23·7	90·7	21st	53·3	17th	37·4
	Bhagalpur	159·78	29·780	?	29·897	29·912	7th	29·704	20th	·208	70·0	83·8	?	62·4	?	73·1	?	21·4	93·7	28th	58·0	9th & 17th.	35·7
	Durbhunga	166·32	29·781	+·035	29·907	29·949	7th	29·685	20th	·264	67·1	82·2	−5·6	60·1	−3·4	71·2	−4·5	22·1	92·4	28th	50·0	26th	42·4
	Mozufferpore	178·42	29·753	?	29·892	29·916	7th	29·658	20th	·258	?	81·8	?	59·3	?	70·6	?	22·5	92·3	28th	51·3	8th	41·0
	Motiharee	223·61	29·703	?	29·893	29·861	7th	29·621	20th	·240	65·3	82·1	?	56·7	?	69·4	?	25·4	92·2	28th	48·9	4th	43·3
	Chupra	181·3	29·744	?	29·896	29·888	7th	29·670	20th	·218	67·7	84·1	?	60·7	?	72·4	?	23·4	94·1	28th	56·0	4th	38·1
N.-W. P. (Eastern District).	Benares	266·97	29·682	+·035	29·917	29·826	7th	29·583	21st	·243	66·9	85·1	−8·7	59·0	−3·5	72·1	−6·1	26·1	94·8	22nd	54·0	4th & 11th.	40·8
	Allahabad	309·28	29·645	+·034	29·923	29·792	7th	29·523	12th	·269	68·0	86·2	−7·5	58·9	−3·4	72·6	−5·5	27·3	94·9	27th	51·6	7th	43·3
N. W. P. (Eastern Submontane).	Gorakhpur	255·93	29·676	+·034	29·903	29·831	7th	29·597	20th	·234	66·2	82·8	−8·5	59·8	−2·8	71·3	−5·7	23·0	91·9	28th	54·3	4th, 7th & 9th.	37·6
Oudh, South	Lucknow	369·4	29·583	+·042	29·929	29·732	7th	29·500	21st	·232	65·9	83·4	−8·2	57·5	−3·2	70·5	−5·7	25·9	91·3	27th	49·0	7th	42·3
N.-W. Provinces (Central).	Cawnpore	412	29·527	?	29·918	29·670	7th	29·403	12th	·267	66·8	82·7	?	58·2	?	70·5	?	24·5	92·3	27th	49·3	7th	43·0
Upper Sub-Himalayas		...	...	+·042	...	...	...	...	...	...	...	76·0	−8·7	52·8	−4·0	64·4	−6·4	23·2	..	...	...	...	38·9
N.-W. Provinces (Submontane).	Bareilly	568·47	29·362	+·043	29·925	29·518	7th	29·306	13th & 17th.	·212	61·1	80·7	−7·3	56·3	−2·9	68·5	−5·1	24·4	88·3	27th & 31st.	49·1	9th	39·2
	Dehra Dun	2232·4	27·677	?	29·949	27·789	7th	27·584	12th	·205	57·5	74·5	?	51·0	?	62·8	?	23·5	83·0	31st	46·5	15th	36·5
	Roorkee	886·63	29·034	+·036	29·937	29·170	7th	28·915	12th	·255	59·7	79·5	−6·6	53·2	−3·5	66·3	−5·1	26·3	88·[illegible]	31st	47·2	8th & 9th.	41·4
	Meerut	737·48	29·196	+·042	29·936	29·319	7th	29·063	12th	·256	61·8	80·4	−7·0	53·6	−4·4	67·0	−5·7	26·8	87·	31st	50·1	10th & 11th.	37·6
Punjab (Central)	Delhi	717·81	29·231	+·045	29·946	29·349	7th	29·069	12th	·280	64·3	79·9	−9·0	58·5	−4·0	69·2	−6·5	21·4	87	27th & 31st.	53·1	13th & 14th.	34·0
	Lahore	702·22	29·242	+·044	29·955	29·359	8th	29·036	12th	·323	59·1	73·5	−10·8	50·5	−5·9	62·0	−8·4	23·0	83·8	31st	41·6	6th & 7th.	42·2

I—*continued.*

in India, Burma, &c., in March 1891—continued.

Wind Direction. Number of winds from									Wind Velocity.			Hygrometry, 8 A.M.		Mean cloud amount.	Rainfall.									Station.	Meteorological Province or District.
Calm.	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Mean velocity in miles per hour.	Normal.	Precentage 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.	Normal rainfall for period 1st to 31st March.	Variation from normal of period.		
9	3	...	1	1	2	5	3	7	4	?	?	68	?	2·3	7	...	...	5·91	0·72	+5·19	5·91	0·72	+5·19	Nya Doomka.	Central Bengal, —*contd.*
1	...	1	2	2	5	6	9	5	3	3	0	83	·594	5·0	8	...	...	3·96	1·20	+2·76	3·96	1·20	+2·76	Berhampore.	
3	2	3	2	5	1	8	6	1	3	?	?	79	?	3·0	7	...	...	6·10	1·23	+4·87	6·10	1·23	+4·87	Rampore Bauleah.	
3	...	6	...	6	...	4	3	9	4	?	?	75	?	2·3	3	...	...	3·80	0·85	+2·95	3·80	0·85	+2·95	Maldah.	
8	1	3	3	3	1	7	4	1	3	?	?	78	·552	3·8	4	...	...	3·48	0·84	+2·64	3·48	0·84	+2·64	Bogra.	
...	1	1	5	1	6	15	2	...	4	?	?	76	·519	2·2	3	...	...	2·43	0·90	+1·53	2·43	0·90	+1·53	Dinagepore.	North Bengal.
3	1	1	14	1	2	1	8	...	3	?	?	80	?	1·2	3	...	...	1·72	1·15	+0·57	1·72	1·15	+0·57	Rungpore.	
Not observed.									3	?	?	83	·525	0·8	3	...	...	2·47	1·83	+0·64	2·47	1·83	+0·64	Jalpaiguri.	
4	7	2	2	...	3	9	1	3	5	?	?	84	·718	1·9	10	...	...	5·67	1·38	+4·29	5·67	1·38	+4·29	Balasore.	
3	6	3	2	2	3	2	4	6	9	11	−18	85	·796	5·1	4	...	...	1·96	1·38	+0·58	1·96	1·38	+0·58	False Point.	
12	...	5	4	1	3	4	1	1	2	3	−33	78	·711	5·2	7	...	...	3·37	1·14	+2·23	3·37	1·14	+2·23	Cuttack.	
...	...	3	2	...	4	7	9	3	12	?	?	80	·773	4·1	4	...	...	1·81	?	?	1·81	?	?	Shortt's Island.	
8	1	4	...	...	2	13	2	1	10	?	?	81	?	2·6	3	...	...	2·94	0·57	+2·37	2·94	0·57	+2·37	Pooree.	
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2·72	0·50	+2·22	...	...	...	**Gangetic Plain and Chutia Nagpur.**	
4	1	...	...	1	6	5	7	7	9	7	+29	62	·406	5·2	4	...	...	2·63	0·82	+1·81	2·63	0·82	+1·81	Hazaribagh.	Chutia Nagpur.
10	...	...	...	...	5	5	4	7	5	?	?	65	?	4·7	8	...	...	7·52	1·30	+6·22	7·52	1·30	+6·22	Ranchee.	
6	...	4	1	...	...	4	12	2	2	?	?	76	?	5·0	7	...	...	5·19	1·21	+3·98	5·19	1·21	+3·98	Chybassa.	
...	1	1	7	1	8	3	10	...	5	3	+67	63	·462	4·3	3	...	...	2·45	0·64	+1·81	2·45	0·64	+1·81	Gya . .	Behar, (South).
15	...	...	2	...	1	6	6	1	3	?	?	58	?	4·0	2	...	...	2·26	?	?	2·26	?	?	Dehree.	
2	...	1	6	1	1	3	17	...	4	3	+33	59	·429	4·8	3	...	...	2·69	0·41	+2·28	2·69	0·41	+2·28	Patna.	
...	1	1	3	1	3	13		1	3	?	?	67	?	2·4	3	...	...	2·74	0·49	+2·25	2·74	0·49	+2·25	Arrah.	
...	...	3	3	2	1	8	9	5	5	?	?	59	?	4·1	4	...	...	1·32	0·27	+1·05	1·32	0·27	+1·05	Buxar.	
6	1	2	3	1	1	7	7	3	3	3	0	78	·493	2·2	3	...	...	2·12	0·49	+1·63	2·12	0·49	+1·63	Purneah .	Behar (North).
19	..	...	2	1	2	1	5	1	2	?	?	70	?	4·5	4	...	...	3·07	0·39	+2·68	3·07	0·39	+2·68	Bhagalpur.	
1	2	4	3	2	...	7	7	5	5	5	0	71	·466	3·0	4	...	...	2·12	0·34	+1·78	2·12	0·34	+1·78	Durbhunga.	
1	...	2	7	3	...	6	11	1	6	?	?	?	?	3·2	3	...	...	2·11	0·45	+1·66	2·11	0·45	+1·66	Mozufferpore.	
...	2	2	6	3	...	4	9	5	8	?	?	75	?	4·3	3	...	...	3·09	0·51	+2·58	3·09	0·51	+2·58	Motiharee.	
4	...	1	2	1	3	4	11	5	5	?	?	69	?	2·6	3	...	...	3·19	0·38	+2·81	3·19	0·38	+2·81	Chupra.	
4	...	4	3	1	4	11	4	...	5	5	0	69	·451	4·5	2	...	...	1·16	0·17	+0·99	1·16	0·17	+0·99	Benares .	N.-W. P. (Eastern Districts).
4	1	1	3	3	1	5	7	6	5	3	+67	60	·399	5·3	2	...	...	1·13	0·20	+0·93	1·13	0·20	+0·93	Allahabad.	
...	1	1	2	2	2	1	20	2	3	4	−25	67	·435	2·6	3	...	...	2·89	0·26	+2·63	2·89	0·26	+2·63	Gorakhpur .	N.-W. P. (Eastern Submontane).
5	4	...	1	2	...	1	10	8	5	4	+25	63	·396	4·5	3	...	...	2·43	0·23	+2·20	2·43	0·23	+2·20	Lucknow.	Oudh (South.)
3	3	3	3	2	3	4	6	4	5	?	?	56	·360	4·2	3	...	...	1·55	?	?	1·55	?	?	Cawnpore .	N.-W. Provinces (Central).
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2·03	1·04	+0·99	...	...	...	**Upper Sub-Himalayas.**	
10	1	1	1	2	...	1	1	14	4	4	0	70	·378	3·5	4	...	...	3·24	0·99	+2·25	3·24	0·99	+2·25	Bareilly .	N.-W. Provinces (Submontane).
24	...	2	3	...	1	...	...	1	2	2	0	64	·301	4·1	3	...	...	1·69	?	?	1·69	?	?	Dehra Dun.	
17	1	1	1	3	...	1	5	2	4	3	+33	70	·358	2·7	2	...	...	0·91	0·83	+0·08	0·91	0·83	+0·08	Roorkee.	
10	1	...	...	2	...	2	8	8	3	3	0	64	·319	3·2	3	...	...	1·24	1·02	+0·22	1·24	1·02	+0·22	Meerut.	
7	1	1	2	2	...	3	10	5	4	4	0	62	·365	4·0	3	...	...	0·98	0·56	+0·42	0·98	0·56	+0·42	Delhi . .	Punjab (Central).
6	6	5	4	1	1	...	4	4	2	3	−33	74	·371	3·2	6	...	...	2·87	0·69	+2·18	2·87	0·69	+2·18	Lahore.	

Table

Abstract of observations taken at 8 A.M., at 154 stations

Meteorological Province or District.	Station.	Height of Station 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.
Punjab (Submontane).	Ludhiana	811·86	29·109	+·028	29·933	29·209	7th	28·932	12th	·277	60·5	75·2	−10·5	53·5	−3·9	64·4	−7·2	21·7	85·2	31st	46·7	7th	38·5
Punjab (North)	Sialkot	829·47	29·101	+·043	29·953	29·198	7th	28·951	12th	·247	57·7	72·9	−9·2	51·0	−4·4	62·0	−6·8	21·9	83·6	31st	42·6	6th	41·0
	Rawalpindi	1648·9	28·295	+·054	29·984	28·409	7th	28·140	12th	·269	52·2	67·8	−9·4	47·2	−3·3	57·5	−6·4	20·6	80·0	31st	40·0	6th	40·0
Indus Valley and N.-W. Rajputana.		...	...	+·042	...	...	...	..	..	...	...	79·2	−7·0	56·2	−3·7	68·1	−5·4	23·8	...	...	...	...	41·9
Punjab (West)	Peshawar	1110·4	28·897	+·053	30·009	29·020	8th	28·717	12th	·303	54·9	68·0	−8·9	47·4	−4·5	57·8	−6·7	20·6	81·1	31st	37·9	5th	43·2
	Khushab	611·51	29·342	?	29·961	29·447	8th	29·152	12th	·295	59·0	72·3	?	?	?	?	?	?	86·9	31st	?	?	?
	Montgomery	558·46	29·400	?	29·957	29·523	23rd	29·149	12th	·374	61·2	76·5	?	52·2	?	64·4	?	24·3	90·3	31st	42·3	6th	48·0
	D. I. Khan	572·56	29·392	+·028	29·972	29·505	8th	29·165	12th	·340	58·2	74·9	−9·3	50·9	−4·7	62·9	−7·0	24·0	87·6	31st	41·9	7th	45·7
	Mooltan	420·19	29·562	+·053	29·973	29·670	23rd	29·325	12th	·345	60·7	78·3	−7·9	54·3	−3·6	66·3	−5·8	24·0	90·3	31st	48·3	7th	42·0
	Sirsa	661·61	29·277	+·031	29·941	29·393	23rd	29·052	12th	·341	60·4	79·8	−5·6	53·2	−4·1	66·5	−4·9	26·6	88·5	31st	42·2	7th	46·3
Sind and Cutch	Jacobabad	185·9	29·799	+·065	29·955	29·895	8th	29·662	12th	·233	64·5	82·5	−8·5	55·9	−3·5	69·2	−6·0	26·6	96·0	31st	49·5	22nd	46·5
	Hyderabad	117·43	29·863	+·038	29·939	29·937	22nd	29·721	13th	·216	67·7	87·2	−6·3	61·2	−3·4	74·2	−4·9	26·0	95·2	31st	55·1	12th	40·1
	Kurrachee	49	29·945	+·026	29·947	30·013	19th	29·819	11th	·194	68·0	83·5	−2·4	63·9	−2·2	73·7	−2·3	19·6	92·1	5th	56·0	12th	36·1
	Bhuj	394·9	29·567	?	29·925	29·637	19th	29·433	11th & 12th.	·204	72·0	88·6	?	63·5	?	76·1	?	25·1	94·5	31st	56·8	12th & 13th.	37·7
Rajputana (West)	Bickaneer	743·5	29·243	?	29·982	29·439	1st	29·146	26th	·293	63·3	80·1	?	59·1	?	69·6	?	21·0	88·2	31st	55·0	6th, 12th & 31st.	33·2
East Rajputana, Central India and Guzerat.		...	...	+·020	...	...	...	...	...	...	...	86·7	−6·4	60·0	−2·7	73·4	−4·6	26·8	...	...	...	...	41·0
Rajputana (East)	Jeypore	1430·6	28·516	+·020	29·959	28·620	23rd	28·304	12th	·316	65·9	82·6	−7·7	57·2	−3·8	69·9	−5·8	25·4	90·1	31st	51·7	7th	38·4
	Sambhar	1253·52	28·670	+·009	29·939	28·768	8th	28·456	12th	·312	63·3	82·0	−6·4	55·0	−4·4	68·5	−5·4	27·0	87·9	31st	48·9	7th & 8th.	39·0
	Ajmere	1611	28·351	+·030	29·977	28·458	23rd	28·115	12th	·343	65·3	81·8	−7·8	57·8	−1·1	69·8	−4·5	24·0	88·5	26th & 31st.	52·8	14th & 15th.	35·7
	Deesa	465·5	29·498	+·016	29·933	29·563	8th	29·310	12th	·253	71·6	91·0	−4·9	61·4	−2·5	76·2	−3·7	29·6	98·3	31st	53·4	13th	44·9
Kathiawar	Rajkot	428·83	29·548	+·017	29·943	29·616	18th	29·403	12th	·213	69·6	90·2	−6·6	60·2	−2·4	75·2	−4·5	30·0	97·9	31st	54·0	13th	43·9
	Veraval	?	29·965	?	29·928	30·023	27th	29·873	12th	·150	74·6	87·3	?	63·8	?	75·6	?	23·5	96·8	31st	58·3	7th	38·5
	Bhavnagar	?	29·961	?	29·948	30·016	27th	29·838	12th	·178	70·5	91·6	?	64·4	?	78·0	?	27·2	96·4	26th	56·0	13th	40·4
Central India	Nowgong	757·04	29·193	+·026	29·936	29·305	7th	29·034	12th	·271	67·7	86·1	−7·8	58·8	−2·1	72·5	−5·0	27·3	94·6	27th	53·3	14th	41·3
	Sutna	1040·1	28·890	+·014	29·924	28·997	7th	28·723	12th	·274	69·9	85·3	−6·7	59·2	−1·8	72·3	−4·3	26·1	93·1	27th	50·3	7th	42·8
	Indore	1823·2	28·123	+·013	29·946	28·191	23rd	27·979	9th	·212	69·6	88·4	−4·4	58·2	−2·6	73·4	−3·5	30·2	94·5	31st	50·1	14th	44·4
	Neemuch	1630	28·315	+·015	29·948	28·401	23rd	28·108	12th	·293	68·4	85·0	−7·3	58·0	−3·3	71·6	−5·3	27·0	92·3	1st & 31st.	47·9	13th	44·4
Guzerat	Surat	36	29·948	+·011	29·929	29·993	18th	29·855	12th	·138	74·6	94·1	−2·0	64·1	−1·7	79·1	−1·9	30·0	101·2	31st	56·0	7th	45·2
N.-W. P. (West).	Agra	555·44	29·415	+·042	29·959	29·525	7th	29·242	12th	·283	64·2	82·7	−9·3	58·7	−4·2	70·8	−6·8	24·0	90·1	27th	53·1	13th	37·0
	Jhansi	840·13	29·105	+·030	29·933	29·221	23rd	28·947	12th	·274	68·9	87·3	−6·0	62·9	−2·5	75·1	−4·3	24·4	93·5	26th & 27th.	55·9	13th	37·6
Deccan	...	...	...	+·003	...	...	...	...	...	...	...	93·1	−3·6	64·0	−1·6	78·6	−2·6	29·2	...	...	...	...	42·4
Bombay Deccan	Belgaum	2524	27·415	−·018	29·887	27·457	4th & 8th.	27·373	11th	·084	73·0	91·9	−2·2	62·8	−1·4	77·4	−1·8	29·1	97·3	31st	53·9	12th	43·4
	Sholapur	1589·7	28·350	0	29·897	28·406	18th	28·309	25th	·097	77·4	99·2	−1·1	67·9	−1·0	83·5	−1·1	31·3	105·7	31st	59·1	12th	46·6
	Poona	1840·37	28·118	+·005	29·935	28·173	27th	28·045	12th	·128	72·2	96·0	−1·1	61·6	−3·0	78·8	−2·1	34·4	101·2	29th & 31st.	54·9	8th	46·3
Khandesh	Malegaon	1430·12	28·524	+·006	29·935	28·576	4th	28·411	12th	·165	73·2	93·6	−4·0	60·7	−3·1	77·2	−3·6	32·9	99·9	31st	54·0	13th, 14th & 21st.	45·9
	Ahmednagar	2151·62	27·799	?	29·916	27·850	27th	27·716	12th	·134	73·4	92·5	?	60·4	?	76·4	?	32·1	98·7	30th	52·5	3rd	46·2
Berar	Akola	930	28·995	0	29·898	29·046	27th	28·932	12th	·114	73·2	96·3	−2·8	63·7	−2·3	80·0	−2·6	32·6	102·3	30th	55·5	14th	46·8
	Amraoti	1215·5	28·712	+·009	29·900	28·760	4th	28·627	12th	·133	75·4	96·3	−2·7	67·5	−1·0	81·9	−1·9	28·8	100·8	20th & 30th.	56·8	13th	44·0

I—*continued*

in India, Burma, &c., in March 1891—continued.

Wind Direction. Number of winds from									Wind Velocity.			Hygrometry, 8 A.M.		Mean cloud amount.	Rainfall.									Station.	Meteorological Province or 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 March.	Normal rainfall for period 1st to 31st March.	Variation from normal of period.		
8	6	1	...	1	1	...	8	6	3	2	+50	72	·381	3·7	3	...	...	2·36	1·04	+1·32	2·36	1·04	+1·32	Ludhiana .	Punjab (Submontane).
4	13	3	6	..	...	1	3	1	2	2	0	79	·382	3·3	6	...	...	2·38	1·24	+1·14	2·38	1·24	+1·14	Sialkot .	Punjab (North).
15	3	3	1	...	...	1	...	8	2	3	−33	82	·324	4·4	7	...	...	2·60	1·95	+0·65	2·60	1·95	+0·65	Rawalpindi.	
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·88	0·44	+0·44	...	...	...	**Indus Valley and N.-W. Rajputana.**	
10	...	1	1	5	7	2	1	4	4	4	0	76	·333	4·7	5	...	...	1·63	1·84	−0·21	1·63	1·84	−0·21	Peshawar .	Punjab (West).
6	5	4	6	1	2	2	4	1	4	?	?	67	·334	3·5	4	...	...	1·71	?	?	1·71	?	?	Khushab .	
6	6	2	7	1	3	1	3	2	6	?	?	68	·366	3·4	4	...	...	1·32	?	?	1·32	?	?	Montgomery.	
10	6	4	1	..	...	1	2	7	2	2	0	68	·333	2·8	4	...	...	1·23	0·58	+0·65	1·23	0·58	+0·65	D. I. Khan.	
11	...	7	...	2	...	5	...	6	1	2	−50	69	·376	3·1	2	...	...	0·63	0·49	+0·14	0·63	0·49	+0·14	Mooltan.	
6	8	4	2	2	1	2	3	3	6	4	+50	72	·377	3·8	2	...	...	0·92	0·36	+0·56	0·92	0·36	+0·56	Sirsa.	
7	1	4	8	2	1	...	2	6	4	4	0	52	·308	3·5	3	...	...	0·18	0·11	+0·07	0·18	0·11	+0·07	Jacobabad .	Sind and Cutch.
...	3	10	...	...	...	9	1	8	7	8	−12	51	·335	3·6	2	...	...	0·25	0·17	+0·08	0·25	0·17	+0·08	Hyderabad.	
...	5	9	4	1	...	...	4	8	10	12	−17	75	·529	3·4	3	...	...	1·18	0·18	+1·00	1·18	0·18	+1·00	Kurrachee.	
...	8	2	1	...	...	...	7	13	7	8	−12	57	·451	2·1	0	...	...	0	0·10	−0·10	0	0·10	−0·10	Bhuj.	
...	4	8	2	3	...	2	4	8	5	4	+25	56	·325	3·2	3	...	...	0·68	0·11	+0·57	0·68	0·11	+0·57	Bickaneer .	Rajputana (West).
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·55	0·13	+0·42	...	...	...	**East Rajputana, Central India and Guzerat.**	
4	5	10	4	2	...	1	1	4	4	5	−20	50	·310	4·4	2	...	...	1·44	0·07	+1·37	1·44	0·07	+1·37	Jeypore .	Rajputana (East).
11	6	4	1	3	2	...	2	2	7	6	+17	52	·298	3·7	3	...	...	0·66	0·36	+0·30	0·66	0·36	+0·30	Sambhar.	
16	...	6	...	2	4	3	...	...	3	4	−25	56	·343	3·2	3	...	...	0·97	0·01	+0·96	0·97	0·01	+0·96	Ajmere.	
...	8	10	1	1	2	3	3	3	9	9	0	34	·258	3·5	0	...	...	0·09	0·06	+0·03	0·09	0·06	+0·03	Deesa.	
5	5	4	1	...	...	2	4	10	8	8	0	65	·466	2·3	0	...	...	0·11	0	+0·11	0·11	0	+0·11	Rajkot .	Kathiawar.
16	11	...	...	...	...	...	1	3	6	?	?	46	·389	2·8	0	...	...	0	?	?	0	?	?	Veraval.	
...	...	...	...	...	...	12	13	6	10	?	?	73	·546	2·3	1	...	...	0·55	?	?	0·55	?	?	Bhavnagar.	
11	4	2	4	1	1	2	2	4	2	2	0	55	·364	4·6	1	...	...	0·21	0·17	+0·04	0·21	0·17	+0·04	Nowgong. .	Central India.
13	7	1	3	...	2	...	2	3	4	6	−33	45	·316	2·2	2	...	...	0·73	0·25	+0·48	0·73	0·25	+0·48	Sutna.	
10	4	6	4	2	...	2	...	3	2	4	−50	34	·245	2·4	0	...	...	0	0	0	0	0	0	Indore.	
5	4	4	3	3	...	2	3	7	7	9	−22	43	·291	1·7	1	...	...	0·30	0·01	+0·29	0·30	0·01	+0·29	Neemuch.	
...	4	1	...	...	...	1	6	19	?	6	?	58	·504	2·4	0	...	...	0·04	0	+0·04	0·04	0	+0·04	Surat . .	Guzerat.
2	1	1	...	5	1	4	2	15	5	5	0	62	·370	4·4	3	...	...	1·90	0·24	+1·66	1·90	0·24	+1·66	Agra . .	N.-W. P. (West).
8	3	5	2	2	2	3	...	6	3	3	0	53	·375	2·5	3	...	...	0·64	0·33	+0·31	0·64	0·33	+0·31	Jhansi.	
...	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...	...	...	0·46	0·27	+0·19	...	...	...	**Deccan.**	
6	3	4	2	2	1	1	7	5	3	12	−75	46	·368	1·0	1	...	...	0·28	0·48	−0·20	0·28	0·48	−0·20	Belgaum .	Bombay Deccan.
...	4	8	3	2	1	...	3	10	7	8	−13	41	·376	1·3	1	...	...	0·38	0·12	+0·26	0·38	0·12	+0·26	Sholapur.	
23	...	...	1	...	...	...	4	3	8	8	0	39	·307	1·3	0	...	...	0	0·07	−0·07	0	0·07	−0·07	Poona.	
7	...	1	...	...	...	1	11	11	6	6	0	32	·258	1·6	0	...	...	0	0	0	0	0	0	Malegaon .	Khandeish.
3	14	6	1	1	1	...	...	5	7	?	?	53	·436	0·9	0	...	...	0	0·04	−0·04	0	0·04	−0·04	Ahmednagar.	
6	2	6	3	3	...	1	1	9	6	4	+ 50	36	·297	1·4	0	...	...	0·06	0·42	−0·36	0·06	0·42	−0·36	Akola . .	Berar.
...	3	6	12	3	2	...	5	...	7	4	+ 75	37	·329	1·5	0	...	...	0·04	0·23	−0·19	0·04	0·23	−0·19	Amraoti.	

Table

Abstract of observations taken at 8 a.m., at 154 stations.

Meteorological Province or District.	Station.	Height of Station in feet.	Pressure 8 a.m., in inches. 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.	Temperature of Air. 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.
Central Provinces, West.	Khandwa	1043·71	28·896	+·015	29·925	28·957	27th	28·790	12th	·167	71·4	92·9	−5·0	63·4	−1·6	78·2	−3·3	29·5	98·2	1st	56·1	21st	42·1
	Hoshangabad	1020	28·927	+·005	29·935	28·983	27th	28·806	12th	·177	70·1	91·3	−5·2	64·2	0	77·8	−2·6	27·1	96·4	20th	55·8	13th	40·6
	Nagpur	1025	28·902	+·007	29·904	28·973	8th	28·792	12th	·181	74·8	92·9	−6·1	68·1	+0·3	80·8	−2·9	24·8	98·8	31st	62·3	14th	36·5
C. P., Central	Seoni	2030	27·902	−·002	29·922	27·996	8th	27·764	12th	·232	71·9	89·1	−4·9	61·7	−2·0	75·4	−3·5	27·4	95·2	4 dates	56·0	11th	39·2
	Jubbulpore	1327·02	28·602	+·010	29·925	28·684	8th	28·450	12th	·234	68·9	88·6	−4·9	59·8	−1·4	74·2	−3·2	28·8	95·0	19th	51·9	14th	43·1
	Saugor	1761·5	28·171	+·011	29·934	28·249	23rd	28·012	12th	·237	67·8	88·3	−4·2	60·4	−4·3	74·4	−4·3	27·9	94·4	18th	50·9	13th	43·5
C. P., East	Raipur	960	28·965	+·019	29·908	29·045	7th	28·895	12th	·150	73·8	90·7	−6·2	67·5	−1·2	79·1	−3·7	23·2	97·9	31st	60·7	14th	37·2
Hyderabad South	Secunderabad	1786·69	28·150	−·021	29·902	28·208	18th	28·103	11th & 25th.	·105	75·4	97·3	−0·6	69·7	+0·1	83·5	−0·3	27·6	100·7	16th & 28th.	65·5	6th	35·2
West Coast		...	...	−·012	...	...	...	...	...	...	...	88·0	−0·4	73·3	−0·8	80·4	−0·6	15·2	...	...	...	...	21·7
Konkan	Bombay	37	29·934	−·002	29·911	29·990	14th	29·864	31st	·126	75·8	83·8	−1·9	71·9	−1·6	77·9	−1·8	11·9	86·4	5th & 19th.	69·0	14th & 15th.	17·4
	Ratnagiri	110	29·834	−·011	29·885	29·883	8th	29·770	31st	·113	78·6	87·2	−0·5	72·0	−0·4	79·6	−0·5	15·2	89·9	29th	66·4	8th & 10th.	23·5
	Mormagao	?	29·895	?	29·891	29·[illegible]38	9th & 17th.	29·828	28th	·110	78·8	?	?	77·3	?	?	?	?	?	?	73·0	11th	?
	Karwar	43·87	29·909	−·019	29.890	29·963	8th	29·861	11th	·102	74·5	88·0	+0·3	71·1	−2·1	79·6	−0·9	16·9	90·3	21st	65·9	10th, 11th & 15th.	24·4
Malabar	Mangalore	25·60	29·942	−·012	29·901	29·988	8th	29·895	30th	·093	80·2	89·2	+0·4	75·5	−0·3	82·4	+0·1	13·7	91·3	29th	71·9	10th & 11th.	19·4
	Calicut	26·58	29·930	−·021	29·888	29·971	4th	29·890	15th	·081	81·6	90·2	?	75·7	?	83·0	?	14·5	93·4	29th	72·6	10th & 15th.	20·8
	Cochin	11·03	29·952	−·008	29·892	30·001	4th	29·911	15th	·090	81·7	90·4	−0·1	76·8	+0·2	83·6	+0·1	13·6	92·3	8th	71·2	24th	21·1
	Trivandrum	?	29·603	?	29·881	29·657	4th & 18th.	29·555	11th	·102	79·5	87·1	?	66·3	?	76·7	?	20·8	89·0	10th	64·0	12th & 18th.	25·0
South India		...	...	−·012	...	...	...	...	...	...	...	92·6	−0·5	72·4	+0·6	82·5	+0·1	20·3	...	...	...	...	31·2
Madras, South	Madura	446·60	29·514	−·014	29·902	29·570	4th	29·446	15th	·124	79·2	94·9	−2·1	73·0	+0·7	84·0	−0·7	21·9	104·0	30th	64·7	4th	39·3
Madras, South Central.	Salem	939·91	29·053	−·006	29·945	29·104	23rd	29·004	11th	·100	77·5	98·6	+0·3	71·5	+1·2	85·1	+0·8	27·1	103·4	30th	63·4	1st	40·0
	Coimbatore	1347·64	28·604	−·027	29·913	28·658	23rd	28·550	11th	·108	75·3	97·0	+0·7	69·2	−0·6	83·2	+0·1	27·8	99·3	20th & 30th.	63·6	4th	35·7
Coorg	Mercara	3780·7	26·273	?	29·895	26·311	4th	26·232	11th	·079	70·0	87·0	+2·6	60·9	−0·4	74·0	+1·1	26·1	89·7	31st	54·2	9th	35·5
Mysore	Bangalore	2981·46	27·020	−·027	29·919	27·058	4th	26·978	15th	·080	73·6	90·0	−0·3	65·1	+1·0	77·6	+0·4	24·9	93·2	30th	58·9	1st	34·3
Madras, East-Coast, South.	Negapatam	15	29·941	−·025	29·887	29·995	23rd	29·875	15th	·120	81·1	86·1	−2·5	75·5	+0·3	80·8	−1·1	10·6	88·0	4 dates	66·7	1st	21·3
	Cuddalore	12·44	29·970	?	29·912	30·037	4th	29·920	10th & 31st	·117	79·7	89·0	?	72·3	?	80·7	?	16·7	92·2	29th	65·3	21st	26·9
	Trichinopoly	254·78	29·716	−·012	29·908	29·778	23rd	29·648	15th	·130	78·6	95·8	−1·5	72·1	−0·3	84·0	−0·9	23·7	100·6	30th	65·4	2nd	35·2
	Madras	22	29·953	−·016	29·908	30·003	4th & 23rd.	29·891	15th	·109	80·3	90·0	+0·5	72·2	−0·1	81·1	+0·2	17·8	94·0	29th	64·5	1st	29·5
Madras, East-Coast, Central.	Nellore	70·82	29·881	?	29·889	29·933	18th	29·811	15th	·122	80·0	95·1	?	72·0	?	83·6	?	23·1	98·8	16th & 29th.	66·1	1st	32·7
	Masulipatam	7·5	29·952	−·016	29·903	30·013	4th	29·889	15th	·124	84·1	89·9	−1·7	74·9	+2·5	82·4	+0·4	15·0	93·6	4th & 28th.	70·1	3rd	23·5
Madras, Central.	Cuddapah	433·36	29·518	?	29·892	29·573	4th	29·466	15th	·107	84·4	101·0	?	75·5	?	88·3	?	25·5	104·7	29th & 30th.	70·1	1st	34·6
	Kurnool	923·45	29·015	?	29·886	29·075	18th	28·966	15th & 16th.	·109	81·7	99·6	?	73·7	?	86·7	?	25·9	102·5	4 dates	65·3	1st	37·2
	Bellary	1474·63	28·456	+·001	29·881	28·505	18th	28·411	16th	·094	80·6	99·1	−1·4	72·2	+0·4	85·6	−0·5	26·9	102·5	31st	65·8	2nd	36·7
Madras, East-Coast, North.	Rajahmundry	112	29·849	?	29·901	29·915	4th	29·799	15th	·116	81·0	95·9	?	74·1	?	85·0	?	21·8	102·0	30th	71·0	1st, 6th & 7th.	31·0
	Cocanada	26	29·948	?	29·911	30·004	4th	29·900	15th	·104	81·0	88·6	?	74·4	?	81·5	?	14·2	108·4	23rd	70·6	5th & 6th.	37·8
	Vizagapatam	31	29·938	−·002	29·909	29·987	4th	29·862	15th	·125	81·2	85·1	−1·2	77·5	+1·4	81·3	+0·1	7·6	88·9	3rd & 31st.	74·4	6th	14·5
	Gopalpur	21·45	29·939	+·012	29·902	30·006	6th	29·885	20th	·121	80·1	84·5	+0·9	76·3	+1·4	80·4	+1·2	8·2	89·2	2nd	72·8	9th	16·4
Hill Stations		...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Beluchistan	Quetta	5502·26	24·651	+·018	?	24·761	4th	24·502	11th	·259	43·3	56·8	−7·7	35·2	−4·8	46·1	−6·3	21·6	72·0	31st	28·8	14th	43·2
North India	Murree	6343·86	23·834	−·007	?	23·976	23rd	23·665	13th	·311	40·8	48·8	−10·2	35·5	−8·9	42·2	−9·6	13·3	63·6	31st	30·7	21st & 22nd.	32·9
	Simla	7274	23·018	?		23·098	18th	22·844	12th	·254	42·0	52·0	−10·3	38·0	−6·9	45·0	−8·6	14·0	61·8	31st	31·2	21st	30·6

I—*continued.*

in India, Burma, &c., in March 1891—continued.

Wind Direction. Number of winds from									Wind Velocity.			Hygrometry, 8 A.M.		Mean cloud amount.	Rainfall.									Station.	Meteorological Province or 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 March.	Normal rainfall for period 1st to 31st March.	Variation from normal of period.		
4	5	6	1	...	1	2	5	7	5	5	0	39	·293	1·1	0	...	...	0	0·07	−0·07	0	0·07	−0·07	Khandwa .	Central Provinces, West.
5	4	13	2	...	...	3	4	...	5	2	+150	40	·293	1·6	0	...	...	0	0·14	−0·14	0	0·14	−0·14	Hoshangabad	
3	7	6	2	2	4	1	1	5	6	5	+ 20	52	·444	1·7	3	...	...	0·86	0·49	+0·37	0·86	0·49	+0·37	Nagpur.	
1	6	...	9	...	6	5	1	3	5	3	+ 67	56	·437	2·2	4	...	...	1·32	0·53	+0·79	1·32	0·53	+0·79	Seoni .	C. P., Central.
7	2	10	1	5	2	2	2	..	3	3	0	54	·377	1·8	1	...	...	0·21	0·32	−0·11	0·21	0·32	−0·11	Jubbulpore.	
...	3	7	8	6	...	2	2	3	3	3	0	43	·284	1·6	0	...	...	0·17	0·14	+0·03	0·17	0·14	+0·03	Saugor.	
3	3	8	4	2	4	5	1	1	6	5	+ 20	64	·526	4·3	8	...	...	2·88	0·60	+2·28	2·88	0·60	+2·28	Raipur .	C. P., East.
4	1	3	11	4	4	2	...	2	5	5	0	64	·556	3·2	3	...	...	0·63	0·37	+0·26	0·63	0·37	+0·26	Secunderabad	Hyderabad, South.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1·11	0·39	+0·72	...	...	...	**West Coast**	
...	12	9	5	2	...	1	1	1	12	11	+ 9	69	·617	1·8	1	...	...	0·20	0	+0·20	0·20	0	+0·20	Bombay .	Konkan.
4	7	7	2	...	...	2	...	9	8	10	− 20	62	·602	0·3	0	...	...	0·02	0	+0·02	0·02	0	+0·02	Ratnagiri.	
2	3	3	6	2	2	...	1	12	10	?	?	76	·747	1·2	0	...	...	0	?	?	0	?	?	Mormagao.	
3	...	26	1	...	...	...	1	...	3	?	?	80	·689	0·7	0	...	...	0	0	0	0	0	0	Karwar.	
10	13	4	2	...	...	...	...	2	3	3	0	77	·788	1·5	1	...	...	0·25	0	+0·25	0·25	0	+0·25	Mangalore .	Malabar.
10	5	5	6	1	...	...	...	4	9	?	?	75	·811	1·5	2	...	...	0·49	0·49	0	0·49	0·49	0	Calicut.	
16	3	2	7	1	...	...	...	2	0	?	?	78	·851	1·4	6	...	...	4·72	1·82	+2·90	4·72	1·82	+2·90	Cochin.	
...	6	9	8	1	...	...	...	7	7	?	?	79	·805	2·9	7	...	...	3·23	?	?	3·23	?	?	Trivandrum.	
...	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·53	0·45	+0·08	...	...	...	**South India.**	
10	5	5	4	5	...	...	1	1	2	4	− 50	77	·772	3·6	2	...	...	1·20	0·19	+1·01	1·20	0·19	+1·01	Madura .	Madras, South.
4	1	15	9	...	2	...	...	...	4	6	− 33	78	·748	2·2	1	...	...	0·29	0·96	− 0·67	0·29	0·96	−0·67	Salem .	Madras, South Central.
..	9	6	6	2	1	2	1	4	2	3	− 33	78	·692	4·3	2	...	...	0·36	0·61	−0·25	0·36	0·61	−0·25	Coimbatore.	
...	12	1	6	...	...	...	5	7	1	3	− 67	66	·482	4·8	1	...	...	0·20	0·96	−0·76	0·20	0·96	−0·76	Mercara .	Coorg.
...	...	1	1	9	12	5	2	1	1	4	− 75	63	·527	2·0	1	...	...	0·87	0·52	+0·35	0·87	0·52	+0·35	Bangalore .	Mysore.
11	1	1	2	5	...	...	4	7	6	4	+ 50	78	·834	5·0	0	...	...	0	0·43	−0·43	0	0·43	−0·43	Negapatam.	Madras, East Coast, South.
...	1	1	1	3	2	2	10	11	3	?	?	84	·856	1·4	0	...	...	0	?	?	0	?	?	Cuddalore.	
4	7	14	3	2	...	...	...	1	4	4	0	79	·774	3·4	1	...	...	0·65	0·57	+0·08	0·65	0·57	+0·08	Trichinopoly.	
1	...	...	...	2	8	7	12	1	6	6	0	77	·804	3·2	0	...	...	0	0·21	−0·21	0	0·21	−0·21	Madras.	
1	...	...	...	15	14	1	...	...	7	?	?	78	·804	4·7	0	...	...	0·04	?	?	0·04	?	?	Nellore .	Madras, East Coast, Central.
8	2	...	...	8	13	...	...	...	3	7	− 57	85	·892	3·8	1	...	...	0·66	0·08	+0·58	0·66	0·08	+0·58	Masulipatam	
...	...	5	4	19	3	...	...	...	?	?		55	·656	0·5	0	...	...	0	0·14	−0·14	0	0·14	−0·14	Cuddapah .	Madras, Central.
29	...	1	...	...	1	...	...	...	?	?	?	53	·575	1·0	1	...	...	0·23	0·34	−0·11	0·23	0·34	−0·11	Kurnool.	
23	...	...	1	...	...	1	1	5	4	5	− 20	60	·647	1·1	0	...	...	0·11	0·21	−0·10	0·11	0·21	−0·10	Bellary.	
7	...	1	5	11	4	...	2	1	?	?	?	70	·767	4·6	0	...	...	0	?	?	0	?	?	Rajahmundry	Madras, East Coast, North.
7	6	3	2	8	...	...	3	2	6	?	?	71	·729	1·7	2	...	...	1·82	?	?	1·82	?	?	Cocanada.	
...	...	...	...	...	...	...	28	3	2	3	− 33	72	·766	2·7	2	...	...	0·28	0·40	−0·12	0·28	0·40	−0·12	Vizagapatam.	
5	5	1	1	1	2	12	1	3	12	12	0	78	·791	1·3	5	...	...	2·78	0·67	+2·11	2·78	0·67	+2·11	Gopalpur.	
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	**Hill Stations.**	
28	...	...	...	...	...	1	1	1	2	5	− 60	61	·172	3·0	2	...	...	0·59	1·95	−1·36	0·59	1·95	−1·36	Quetta. .	Beluchistan, North India.
5	2	5	6	12	1	...	...	...	8	9	− 11	64	·164	4·7	16	...	...	11·23	3·61	+7·62	11·23	3·61	+7·62	Murree.	
...	...	3	6	15	5	1	...	1	?	3	?	60	·158	4·6	7	...	...	1·70	2·75	−1·05	1·70	2·75	−1·05	Simla.	

Table

Abstract of observations taken at 8 A.M., at 154 stations

Meteorological Province or District.	Station.	Height of Station 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.
North India —*contd.*	Mussooree	?	23·538	?	?	23·620	23rd	23·394	13th	·226	43·8	55·0	?	34·9	?	45·0	?	20·1	67·2	31st	28·0	14th	39·2
	Ranikhet	6068·75	24·094	—·007	?	24·168	26th	24·009	3rd	·159	47·8	58·2	—7·2	43·1	—6·1	50·7	—6·7	15·1	67·6	31st	31·5	13th	36·1
	Darjeeling	7421·1	22·962	—·005	?	23·038	5th & 6th.	22·855	14th	·183	44·8	52·5	—4·3	39·2	—4·1	45·8	—4·2	13·3	60·6	24th	34·3	14th	26·3
Central India	Mount Abu	3945	26·092	+·003	?	26·170	28th	25·957	11th	·213	61·9	70·1	—9·0	55·8	—6·2	63·0	—7·6	14·3	77·6	31st	47·0	12th & 13th.	30·6
	Pachmarhi	3511	26·503	—·007	?	26.567	28th	26·376	12th	·191	68·8	80·7	—4·2	58·9	—1·6	69·8	—2·9	21·8	85·7	31st	50·2	12th	35·5
South India	Wellington	6200	24·308	+·010	?	24·351	4th	24·270	15th	·081	63·6	72·8	—0·9	51·4	—1·5	62·1	—1·2	21·4	76·2	11th & 30th.	45·7	6th	30·5
Extra India.		...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Persia	Meshed	?	Not recorded.								40·1	56·4	?	36·1	?	46·3	?	20·3	75·0	27th & 28th	29·0	11th	46·0
	Bushire	14	30·045	?	30·016	30·161	19th	29·921	13th	·240	65·6	71·9	?	60·3	?	66·1	?	11·6	93·8	31st	52·3	1st	41·5
Arabia	Baghdad	?	29·639	?	?	29·658	31st	29·618	15th	·040	66·3	77·9	?	44·4	?	61·2	?	33·5	85·3	28th	41·0	1st	44·3
	Aden	94·1	29·902	?	29·929	30·005	5th	29·845	1st	·160	78·8	84·1	?	75·1	?	79·6	?	9·0	90·3	25th	70·7	2nd	19·6
Arabian Sea Islands	Minicoy	10·46	29·971	?	29·906	30·020	5th	29·924	16th	·096	82·2	88·1	?	79·9	?	84·0	?	8·2	90·6	31st	75·4	9th	15·2

I—*concluded.*

in India, Burma, &c., in March 1891—concluded.

Wind Direction. Number of winds from									Wind Velocity.			Hygrometry, 8 A.M.			Rainfall.										
Calm	N.	NE.	E.	SE.	S.	SW.	W.	NW.	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 31st March.	Normal rainfall for period 1st to 31st March.	Variation from normal of period.	Station.	Meteorological Province or District.
...	8	2	3	7	4	1	...	6	?	?	?	67	·193	3·6	5	...	...	2·26	?	?	2·26	?	?	Mussooree.	North India —*contd.*
...	1	2	6	..	...	...	...	1	5	3	+67	69	·236	3·9	5	...	...	3·76	2·46	+1·30	3·76	2·46	+1·30	Ranikhet.	
21	...	1	1	...	1	6	3	1	8	7	+14	82	·222	4·8	4	...	...	3·47	1·85	+1·62	3·47	1·85	+1·62	Darjeeling.	
18	4	11	2	...	...	4	3	4	7	7	0	40	·215	3·5	2	...	...	0·66	0·06	+0·60	0·66	0·06	+0·60	Mount Abu .	Central India.
3	2	4	11	4	...	3	5	2	5	5		36	·258	2·5	1	...	...	0·20	0·31	−0·11	0·20	0·31	−0·11	Pachmarhi .	
...	...	4	3	3	1	...	...	1	2	3	−33	59	·347	1·5	2	...	...	2·22	2·21	+0·01	2·22	2·21	+0·01	Wellington .	South India.
19																									
	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...		...	...	**Extra India.**	
...	8	3	...	1	1	2	2	8	1	?	?	?	?	4·5	2	...	...	1·10	?	?	1·10	?	?	Meshed .	Persia.
6	3	9	3	10	...	1	...	5	7	9	−22	71	·450	?	1	...	...	0·21	0·72	−0·51	0·21	0·72	−0·51	Bushire .	
...	18	2	1	1	6	...	1	2	5	?	?	78	·507	1·6	2	...	...	0·60	?	?	0·60	?	?	Baghdad .	Arabia.
...	...	6	18	1	...	...	...	...	12	15	−20	74	·735	3·9	1	...	...	1·34	0·51	+0·83	1·34	0·51	+0·83	Aden .	
...	6	2	1	...	...	...	7	11	6	?	?	78	·862	3·3	2	...	...	0·60	?	?	0·60	?	?	Minicoy .	Arabian Sea Islands.

Table

Abstract of observations recorded at 10 A.M. and 4 P.M., at 86 stations

Station.	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 to 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.
Murree	23·865	23·837	·028	23·847	− ·005	?	49·7	35·3	14·3	65·6	30·7	34·9	44·8	44·8	41·5	− 8·8	32·1	38·9	39·5	36·8
Chamba	26·978	26·905	·074	26·953	+ ·014	?	63·1	45·8	17·4	76·8	39·1	37·7	55·1	58·9	52·5	− 8·3	43·4	48·4	51·1	47·6
Kailang	20·768	20·714	·054	20·754	− ·063	?	36·7	16·1	20·7	42·2	5·0	37·2	29·1	32·2	24·3	− 5·8	15·2	25·0	27·7	22·6
Simla	23·043	22·996	·047	23·013	?	?	52·1	38·0	14·1	63·2	31·2	32·0	46·0	48·5	44·4	− 6·6	33·7	38·9	41·1	38·0
Peshawar	28·914	28·831	·084	28·867	+ ·051	30·014	68·5	47·5	21·0	81·1	37·9	43·2	61·5	66·0	57·2	− 6·1	44·8	54·2	55·3	51·4
Lahore	29·263	29·186	·077	29·219	+ ·047	29·923	73·8	50·5	23·3	86·3	41·4	44·9	66·8	72·2	61·6	− 6·3	49·4	58·1	58·9	55·5
Ludhiana	·123	·045	·078	·078	+ ·020	·891	75·0	53·3	21·7	87·1	46·2	40·9	68·3	73·0	63·5	− 5·4	51·2	58·8	59·8	56·6
Mooltan	·578	·483	·095	·525	+ ·059	·930	79·0	54·4	24·6	93·8	48·3	45·5	65·9	76·7	66·0	− 5·0	48·8	58·7	66·6	58·0
Jacobabad	·820	·696	·124	·751	+ ·063	·902	83·6	55·9	27·7	98·9	49·4	49·5	74·2	81·8	69·1	− 5·9	49·8	58·2	59·7	55·6
Hyderabad	·872	·771	·101	·822	+ ·046	·894	86·9	61·3	25·7	97·0	55·3	41·7	76·2	84·0	73·4	− 4·5	53·8	59·4	61·4	58·2
Kurrachee	·959	·855	·104	·903	+ ·022	·906	83·6	64·0	19·6	92·0	55·9	36·1	75·5	81·1	73·3	− 2·2	59·1	64·4	68·2	63·9
Jeypore	28·541	28·430	·111	28·480	+ ·028	·902	82·8	57·1	25·7	93·1	51·6	41·5	74·1	80·5	69·3	− 5·5	50·4	58·2	59·8	56·1
Ajmere	·368	·260	·108	·310	+ ·024	·915	81·9	57·7	24·2	92·4	52·6	39·8	73·7	80·1	69·9	− 3·2	53·8	60·0	62·6	58·8
Mount Abu	26·113	26·037	·076	26·069	− ·006	?	70·0	56·0	14·0	80·1	45·6	34·5	65·3	68·0	62·5	− 6·5	46·1	50·7	51·8	49·6
Chakrata	23·305	23·253	·053	23·272	+ ·021	?	56·4	37·5	18·9	66·9	31·1	35·8	47·7	48·9	45·3	− 6·2	34·9	42·1	43·1	40·0
Ranikhet	24·117	24·062	·055	24·083	− ·004	?	58·4	43·0	15·3	68·1	31·5	36·6	53·4	54·6	50·0	− 6·9	38·7	46·0	47·3	44·0
Pithoragarh	24·784	24·717	·067	24·744	+ ·024	?	62·2	45·2	17·0	72·0	37·6	34·4	56·7	60·1	53·4	− 6·2	41·2	49·0	49·6	46·6
Dehra	27·693	27·612	·081	27·653	+ ·022	·903	74·8	51·0	23·7	83·3	46·6	36·7	66·3	69·8	61·7	− 5·5	47·8	55·2	55·6	52·7
Roorkee	29·057	28·958	·099	29·001	+ ·031	·888	79·8	53·2	26·7	89·1	47·2	41·9	70·1	77·5	65·8	− 4·1	49·3	58·2	59·1	55·5
Meerut	·221	29·121	·100	·164	+ ·045	·892	80·7	53·6	27·1	89·3	49·1	40·2	72·1	78·3	66·4	− 5·2	52·0	59·0	60·0	57·0
Agra	·450	·324	·126	·375	+ ·055	·907	82·9	58·5	24·4	92·6	51·6	41·0	73·3	81·6	69·9	− 5·0	52·5	60·7	62·3	58·5
Lucknow	·610	·490	·119	·544	+ ·043	·882	83·9	57·5	26·4	92·3	49·0	43·3	74·9	81·3	70·9	− 5·6	53·4	61·6	61·8	58·9
Allahabad	·664	·538	·126	·590	+ ·033	·860	86·1	58·9	27·2	94·7	51·5	43·2	76·5	84·3	72·2	− 6·2	54·9	62·3	63·6	60·3
Ghazipur	29·753	29·632	·121	·685	+ ·045	·930	85·9	61·9	24·0	93·6	56·9	36·7	77·5	82·7	73·4	− 3·4	58·6	64·3	64·2	62·4
Nowgong	·203	·082	·121	·134	+ ·018	·862	86·3	58·7	27·6	94·6	50·4	44·2	76·9	84·5	72·3	− 5·0	53·3	61·8	64·6	59·9
Sutna	28·905	28·775	·130	28·833	+ ·008	·850	85·4	59·2	26·2	93·3	50·1	43·2	77·9	84·2	72·2	− 4·4	52·6	59·7	61·4	57·9
Durbhunga	29·806	29·679	·127	29·738	+ ·044	·862	82·6	60·5	22·1	92·6	54·5	38·1	74·3	81·8	71·8	− 4·3	58·7	64·5	66·1	63·1
Patna	29·782	29·657	·124	·715	+ ·035	·855	84·3	61·3	23·0	94·4	56·7	37·7	77·0	82·3	72·7	− 4·5	57·0	63·5	64·5	61·7
Hazaribagh	27·940	27·842	·098	27·886	+ ·018	·863	82·7	60·8	21·9	90·3	54·5	35·8	74·1	79·9	71·4	− 4·0	54·8	60·4	62·2	59·1
Darjeeling	22·976	22·907	·069	22·943	− ·008	?	52·8	39·2	13·6	60·6	34·3	26·3	47·2	49·9	45·3	− 3·0	36·3	43·1	45·2	41·5
Pedong	25·315	25·219	·095	25·268	− ·014	?	64·9	48·4	16·5	73·6	42·5	31·1	59·5	61·2	55·8	− 2·8	45·9	53·8	54·0	51·1
Berhampore	29·911	29·784	·126	29·838	+ ·046	·855	83·6	64·7	18·9	92·2	60·7	31·5	75·7	82·1	73·7	− 5·0	62·6	67·3	69·3	66·4
Burdwan	·891	·762	·129	·818	+ ·055	·865	85·3	66·8	18·5	93·6	62·4	31·2	77·0	82·4	75·2	− 5·8	64·6	67·5	68·7	66·9
Calcutta (Alipore)	·964	·844	·120	·897	+ ·040	·864	84·9	67·8	17·1	91·5	62·9	28·6	77·8	83·3	75·6	− 3·7	66·0	70·1	71·2	69·1
Calcutta (Chowringhee)	·965	?	?	?	?	?	86·7	68·2	18·5	93·0	63·5	29·5	79·4	?	77·5	?	66·7	71·3	?	?
Saugor Island	·964	·848	·116	·899	+ ·039	·868	83·9	72·2	11·8	90·5	65·2	25·3	79·7	81·8	76·4	− 3·2	69·8	74·5	74·6	73·0
Dacca	·962	·849	·113	·902	+ ·043	·872	85·1	66·9	18·2	92·3	62·6	29·7	78·2	82·4	75·2	− 3·3	64·2	70·0	69·9	68·0
Chittagong	·905	·798	·106	·846	+ ·013	·881	87·3	68·5	18·7	92·9	63·8	29·1	81·2	82·7	77·3	+ 0·5	64·9	72·0	71·9	69·8
Demagiri	Not recorded.						84·2	64·4	19·8	90·3	59·5	30·8	77·6	83·2	74·1	+ 0·6	?	?	?	?
Tura	Ditto.						79·1	66·3	12·8	87·1	57·4	29·7	72·5	76·9	72·3	− 2·2	?	62·2	64·6	?
Dhubri	·857	·721	·136	·787	+ ·026	·859	81·5	62·4	19·1	90·2	58·6	31·6	72·2	80·4	70·7	− 3·8	60·5	64·9	66·2	63·9
Sibsagar	·63	·49	·140	·564	− ·029?	·862	77·1	59·6	17·5	85·1	55·5	29·6	68·1	75·6	67·1	− 0·5	59·2	64·8	67·5	63·8
Silchar	·889	·762	·127	·822	+ ·014	·879	84·3	62·8	21·5	91·7	57·0	34·7	75·2	82·1	72·7	− 0·7	61·4	68·5	69·4	66·5

II.

in India, Burma, &c., in the month of March 1891.

Vapour Tension.					Humidity.					Cloud.				Wind Direction.											Wind Steadiness.		Wind Velocity.		Station.
														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.	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.	
·150	·178	·193	·176	− ·018	74	61	66	67	+ 13	5·2	7·7	6·5	+ 0·5	4	4	2	9	28	12	..	...	2	S. 49° E.	S. 35° E.	63	28	201	214	Murree.
·255	·265	·286	·269	− ·017	82	62	59	68	+ 13	5·1	8·2	6·7	+ 1·3	28	9	...	2	4	2	1	3	13	N. 33° W.	N. 15° E.	25	17	100	115	Chamba.
·083	·103	·116	·101	?	89	63	63	72	?	5·3	7·7	6·5	+ 0·2	...	2	...	...	2	3	8	40	7	S. 86° W.	S. 64° W.	80	71	39	31	Kailang.
·150	·166	·185	·167	− ·033	65	54	55	58	+ 6	5·4	6·6	6·0	+ 1·2	...	...	1	3	11	27	14	2	2	S. 2° W.	S. 42° W.	69	31	?	?	Simla.
·267	·335	·311	·304	− ·030	80	62	51	64	+ 7	4·5	5·0	4·7	− 0·2	10	6	6	5	5	5	7	10	8	N. 73° W.	N. 15° E.	14	14	94	88	Peshawar.
·341	·371	·326	·346	− ·010	92	57	43	64	+ 15	2·7	3·7	3·2	0	5	14	5	8	3	1	3	13	10	N. 24° W	N. 10° W.	35	33	57	73	Lahore.
·354	·372	·342	·356	− ·012	86	55	44	62	+ 8	3·6	5·4	4·5	+ 0·6	2	26	3	3	1	2	.	14	11	N. 26° W.	N. 47° W.	60	33	77	44	Ludhiana.
·274	·401	·529	·400	+ ·030	64	63	57	61	+ 10	3·9	3·6	3·8	+ 1·4	4	...	25	...	4	...	11	...	18	N.	N. 11° W.	32	21	28	49	Mooltan.
·280	·276	·220	·274	− ·047	64	34	21	39	0	3·7	3·5	3·6	+ 0·5	9	4	5	11	10	6	2	3	12	N. 80° E.	N. 67° E.	15	26	79	93	Jacobabad.
·321	·289	·253	·288	− ·107	58	34	23	38	− 4	4·9	4·5	4·7	+ 3·1	...	3	24	...	...	...	19	1	15	N. 25° W.	N. 83° W	31	39	168	198	Hyderabad.
·442	·467	·523	·475	− ·119	73	53	50	58	− 8	2·8	2·5	2·7	− 0·2	...	3	11	6	1	...	9	23	9	N. 65° W.	S. 69° W.	38	64	230	283	Kurrachee.
·284	·295	·262	·280	− ·032	60	36	26	41	+ 4	3·8	4·7	4·3	+ 1·6	...	5	7	10	2	4	9	9	16	N. 47° W.	N. 20° W.	23	34	91	131	Jeypore.
·370	·351	·352	·358	+ ·020	77	42	36	52	+ 12	2·3	3·5	2·9	+ 0·6	10	4	12	1	5	4	10	9	7	N. 71° W.	S. 61° W.	14	28	77	90	Ajmere.
·203	·206	·203	·209	+ ·005	46	35	31	38	+ 9	3·6	4·8	4·2	+ 1·6	...	8	17	2	2	...	10	12	11	N. 31° W.	S. 85° W.	36	39	157	161	Mount Abu.
·179	·215	·221	·205	+ ·009	79	66	65	70	+ 17	3·4	6·1	4·7	+ 0·7	5	1	17	11	1	...	9	18	...	N. 6° W.	S. 56° W.	10	8	156	138	Chakrata.
·194	·238	·253	·228	− ·006	70	59	61	63	+ 10	4·0	6·3	5·1	+ 1·4	21	...	2	14	1	1	20	3	...	S. 4° W.	S. 56° W.	24	44	132	68	Ranikhet.
·220	·268	·249	·246	− ·013	73	59	50	61	+ 9	4·9	5·6	5·2	+ 1·5	28	...	7	1	8	5	13	...	...	S. 9° E.	S. 29° E.	24	29	89	75	Pithoragarh.
·300	·301	·271	·290	?	82	48	38	56	?	3·1	4·6	3·9	+ 0·4	2	7	2	3	4	5	8	21	10	N. 86° W.	N. 78° W.	43	25	65	55	Dehra.
·303	·331	·259	·298	− ·038	76	46	29	50	+ 1	2·0	2·8	2·4	− 0·1	14	1	1	2	8	1	2	28	5	S. 83° W.	N. 58° W.	40	23	85	70	Roorkee.
·370	·331	·279	·327	− ·045	89	43	31	54	+ 4	2·9	3·5	3·2	+ 0·6	7	2	...	4	5	2	7	16	19	N. 80° W.	N. 51° W.	45	44	74	65	Meerut.
·317	·364	·309	·330	+ ·004	65	46	31	47	+ 9	4·4	4·3	4·4	+ 2·3	...	2	6	1	10	2	9	2	30	N. 55° W.	N. 70° W.	34	39	112	109	Agra.
·357	·376	·295	·343	− ·022	75	46	30	50	+ 7	4·3	4·5	4·4	+ 1·7	...	6	4	3	5	1	5	22	16	N. 66° W.	N. 54° W.	48	49	111	97	Lucknow.
·382	·378	·319	·306	− ·068	77	44	29	50	+ 8	4·5	4·6	4·6	+ 2·7	5	6	6	4	3	1	4	15	18	N. 50° W.	N. 65° W.	43	34	112	72	Allahabad.
·452	·429	·357	·413	?	82	48	35	55	?	3·6	3·8	3·7	+ 2·3	3	3	3	5	8	1	10	17	12	W.	S. 83° W.	32	51	72	68	Ghazipur.
·339	·355	·346	·347	+ ·013	69	39	30	46	+ 8	4·3	4·7	4·5	+ 1·5	...	13	8	12	1	1	2	14	11	N. 11° W.	N. 63° W.	38	34	51	54	Nowgong.
·318	·291	·262	·290	+ ·040	64	31	23	39	+ 8	2·4	2·8	2·6	+ 0·7	8	20	2	3	3	6	...	8	12	N. 25° W	N. 55° W.	39	39	101	135	Sutna.
·474	·480	·433	·462	+ ·001	90	58	42	63	+ 9	2·9	2·1	2·5	+ 1·1	3	1	6	6	4	1	12	20	9	S. 88° W.	S. 70° W.	35	27	122	109	Durbhunga.
·413	·410	·373	·399	− ·009	76	47	37	53	+ 7	4·2	3·6	3·9	+ 1·2	2	1	2	10	1	1	...	41	4	N. 84° W.	N. 74° W.	51	48	98	83	Patna.
·358	·360	·344	·354	+ ·064	68	43	36	49	+ 15	5·5	6·9	6·2	+ 3·7	1	6	...	4	5	7	3	12	24	N. 66° W.	N. 75° W.	41	61	225	178	Hazaribagh.
·186	·238	·257	·227	− ·031	78	75	73	75	+ 2	5·5	6·2	5·9	+ 0·7	16	1	2	1	1	...	22	17	2	S. 50° W.	S. 77° W.	31	43	203	160	Darjeeling.
·285	·354	·336	·324	− ·030	83	70	63	73	+ 2	5·5	6·7	6·2	+ 0·9	...	...	4	16	7	21	...	...	...	S. 46° E.	?	69	?	?	?	Pedong.
·544	·561	·550	·552	+ ·038	86	66	52	69	+ 12	5·2	5·2	5·2	+ 2·4	...	1	2	6	4	7	17	15	10	S. 63° W.	S. 76° W.	43	44	82	82	Berhampore.
·583	·556	·522	·554	+ ·017	88	61	48	66	+ 12	4·5	5·4	4·9	+ 2·6	10	9	...	9	3	4	7	7	13	N. 55° W.	S. 78° W.	20	43	61	80	Burdwan.
·619	·640	·608	·622	− ·049	91	68	55	71	+ 1	5·4	4·9	5·2	+ 2·8	3	9	6	4	4	6	12	8	10	N. 76° W.	S. 32° W.	21	49	74	126	Calcutta (Alipore).
·639	·665	?	?	?	92	67	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	Calcutta (Chowringhee).
·702	·789	·765	·752	− ·070	89	78	71	79	0	5·8	5·5	5·7	+ 2·1	...	10	4	1	4	19	14	6	4	S. 37° W.	S. 33° W.	24	60	258	295	Saugor Island.
·570	·631	·567	·589	− ·045	86	66	53	68	+ 1	5·4	5·4	5·4	+ 2·3	...	8	3	3	5	9	15	9	10	S. 72° W.	S. 23° W.	31	54	93	112	Dacca.
·574	·662	·644	·627	− ·056	81	63	59	68	− 6	4·3	4·7	4·5	+ 1·4	1	7	9	4	5	4	10	7	14	N. 49° W.	S. 54° W.	22	20	71	139	Chittagong.
Wet bulb not recorded.										0·6	2·6	1·6	+ 0·1	3	...	...	2	24	12	16	5	...	S. 4° E.	S. 88° W.	66	21	?	?	Demagiri.
?	·444	·472	?	?	?	57	52	?	?	2·8	2·8	2·8	− 0·1	...	...	...	2	10	13	31	2	4	S. 24° W.	S. 13° W.	70	69	?	?	Tura.
·506	·522	·456	·494	− ·023	89	67	45	67	+ 5	3·2	4·1	3·7	+ 1·3	3	1	5	13	6	3	17	8	5	S. 14° W.	S. 81° E.	19	14	149	151	Dhubri.
·500	·573	·569	·548	+ ·003	98	83	65	82	+ 3	7·7	6·4	7·1	+ 1·0	...	...	42	6	6	3	3	...	2	N. 59° E.	N. 57° E.	69	59	43	66	Sibsagar.
·529	·611	·556	·565	− ·018	92	71	52	72	0	6·7	6·3	6·5	+ 2·2	27	...	4	12	2	6	6	5	...	S. 38° E.	S. 60° E.	19	22	27	78	Silchar.

Table

Abstract of observations recorded at 10 A.M. and 4 P.M., at 86 stations

Station.	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 to 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.
False Point	29·959	29·850	·109	29·904	+ ·016	29·867	85·0	71·4	13·5	89·0	65·3	23·7	82·2	81·9	76·3	− 1·7	69·9	75·4	75·0	73·4
Cuttack	·903	·764	·138	·838	+ ·033	·862	91·2	72·2	19·0	99·9	65·8	34·1	83·0	88·7	79·6	− 2·4	69·4	73·7	74·0	72·3
Sambalpur	·487	·334	·153	·415	+ ·034	·828	90·4	69·5	20·9	96·1	63·5	32·6	80·3	88·5	79·5	− 2·2	65·3	70·7	72·2	69·4
Raipur	28·982	28·823	·158	28·898	+ ·005	·812	90·7	67·5	23·2	97·8	60·7	37·1	80·8	89·6	79·7	− 2·2	62·2	68·1	69·3	66·5
Khandwa	·901	·761	·140	·826	0	·831	93·0	63·4	29·5	100·7	56·1	44·6	83·2	91·3	78·2	− 3·0	52·4	63·0	66·3	60·5
Hoshangabad	·944	·800	·144	·867	− ·001	·852	91·5	64·2	27·3	98·4	56·0	42·4	80·2	90·2	78·0	− 2·5	55·1	61·4	65·5	60·7
Saugor	·190	·071	·119	·126	+ ·016	?	88·6	?	?	95·6	?	?	78·4	86·0	?	?	?	59·3	62·2	?
Jubbulpore	·615	·471	·144	·538	+ ·002	·849	88·6	59·8	28·8	95·1	51·9	43·2	79·2	86·9	74·2	− 2·7	55·3	62·4	64·2	60·6
Pachmarhi	26·527	26·425	·102	26·477	− ·007	?	80·7	?	?	85·7	?	?	73·1	77·8	?	?	?	56·3	57·7	?
Seoni	Imperfect.																			
Nagpur	28·917	28·757	·160	28·833	+ ·008	·809	93·2	68·3	25·3	98·8	62·3	36·5	82·9	91·5	81·5	−2·0	58·1	67·0	69·1	61·7
Chanda	29·299	29·135	·164	29·212	− ·011	·791	95·9	67·4	28·5	103·5	61·1	42·4	84·1	92·4	81·7	−2·1	64·1	70·4	71·7	68·7
Sironcha	·545	·379	·166	·458	− ·038	·800	97·5	73·3	24·2	103·0	68·0	35·0	85·0	94·9	85·6	−1·3	68·1	72·8	73·3	71·4
Chikalda	26·379	26·276	·103	26·323	− ·035	?	82·7	62·7	20·0	88·0	49·6	38·4	74·4	79·6	73·8	−3·9	51·4	58·7	60·8	57·0
Buldana	27·806	27·675	·130	27·735	− ·029	·794	90·8	66·3	24·5	96·5	53·8	42·7	81·6	88·1	78·8	−3·6	52·0	59·7	61·2	57·3
Akola	29·013	28·855	·158	28·928	− ·008	·811	96·4	63·6	32·8	102·2	55·1	47·1	84·6	94·4	80·4	−2·5	53·4	63·3	66·5	61·1
Makhla	Not recorded.						88·1	64·2	23·9	93·8	52·5	41·3	77·0	83·6	75·9	−2·8	55·1	61·6	63·7	60·1
Deesa	·512	29·396	·116	29·448	+ ·021	·874	91·2	61·2	30·0	101·5	53·6	47·9	82·1	88·9	76·6	−4·2	52·5	59·6	62·1	58·2
Bombay	·928	·814	·114	·865	− ·011	·842	84·6	72·0	12·6	87·0	69·0	18·0	79·9	81·8	77·8	−0·9	66·3	70·6	71·6	69·5
Poona	28·121	27·982	·139	28·058	+ ·001	·835	96·2	61·7	34·6	102·2	54·9	47·3	84·2	92·9	78·4	−1·5	53·7	60·8	63·4	59·3
Sholapur	·354	28·195	·159	·271	− ·019	·789	99·5	67·9	31·6	105·8	59·3	46·5	86·9	96·7	83·0	−1·2	58·6	67·7	71·8	66·0
Ratnagiri	29·843	29·738	·105	29·784	− ·009	·832	87·2	71·8	15·4	89·8	66·2	23·6	83·6	84·0	78·9	−0·8	65·4	72·2	73·4	70·3
Karwar	·925	·812	·113	·863	− ·010	·839	88·0	72·8	15·2	90·5	67·1	23·4	82·9	85·3	79·9	−0·3	70·0	73·6	75·1	72·9
Belgaum	27·431	27·299	·132	27·364	− ·020	·797	92·2	62·8	29·4	97·2	54·1	43·1	83·3	87·8	75·9	−1·3	56·9	62·3	65·8	61·6
Secunderabad	28·163	28·023	·140	28·090	− ·008	·801	97·2	69·4	27·8	100·8	56·1	44·7	84·6	93·5	82·4	−0·4	63·6	70·0	71·7	68·4
Vizagapatam	29·962	29·833	·129	29·891	+ ·012	·860	85·3	77·5	7·8	89·0	74·5	14·5	84·3	85·0	80·2	−3·1	71·3	75·1	75·7	74·0
Bellary	28·463	28·310	·153	28·384	− ·005	·782	99·2	72·2	27·0	102·3	66·0	36·3	88·4	97·0	85·2	−0·6	63·6	73·0	73·2	69·9
Madras *	29·879	29·905	·114	29·908	− ·001	·860	90·1	72·3	17·8	93·9	64·5	29·4	87·6	80·2	80·8	0	?	76·9	75·5	75·1
Salem	·059	28·888	·171	28·979	− ·011	·851	98·6	71·1	27·5	103·2	63·2	40·0	81·1	96·2	83·1	+1·6	69·1	75·6	77·2	74·0
Mercara	26·289	26·179	·110	26·234	+ ·002	·855	87·0	61·0	26·0	89·6	54·3	35·3	74·8	80·3	72·0	+0·5	58·0	64·4	66·3	62·9
Trichinopoly	29·729	29·561	·168	29·650	− ·013	·838	96·0	72·1	23·9	100·4	65·2	35·2	85·3	94·3	82·4	−0·7	69·9	74·6	74·2	72·9
Cochin	·963	·829	·134	·890	− ·009	·828	90·3	76·7	13·6	92·3	71·1	21·2	86·5	87·6	83·0	−0·2	75·1	78·4	79·1	77·5
Wellington	24·316	24·239	·077	24·278	+ ·003	?	72·9	51·4	21·5	76·2	45·6	30·6	68·1	68·9	62·8	+0·7	49·2	56·7	57·8	54·6
Akyab	29·958	29·838	·119	29·893	− ·012	·856	89·9	70·5	19·4	100·3	66·9	33·4	83·7	84·7	79·4	+1·4	64·0	72·7	73·3	70·0
Diamond Island	·941	·831	·110	·875	− ·016	·854	87·2	72·2	15·0	91·4	69·7	21·5	82·9	83·4	77·7	−0·9	70·4	75·4	75·7	73·9
Rangoon	·921	·770	·151	·847	− ·023	·825	97·5	71·7	25·8	101·8	66·8	35·0	84·2	92·9	81·7	+1·6	69·2	74·6	75·9	73·2
Mergui	·867	·743	·124	·795	− ·023	·821	91·3	69·6	21·7	94·1	66·0	28·1	85·4	88·7	79·8	−1·3	68·0	77·6	79·2	74·9
Cocos Island	·862	·765	·097	·804	?	·848	87·8	72·5	15·3	91·1	69·7	21·4	84·9	83·6	78·0	?	71·7	76·2	75·8	74·6
Port Blair	·918	·807	·112	·852	− ·007	·844	91·7	77·1	14·6	94·3	73·7	20·6	85·8	89·1	82·7	+1·5	73·7	78·7	80·0	77·5
Quetta	24·662	24·586	·076	24·617	− ·007	?	57·3	35·2	22·3	72·0	29·0	43·0	49·7	54·6	46·0	−5·4	33·6	41·2	42·4	39·1
Leh	19·649	19·563	·086	19·611	− ·060	?	39·0	17·6	21·5	47·2	8·7	38·5	29·0	35·4	27·9	−4·5	16·0	25·9	30·9	24·3
Katmandu	25·678	25·575	·103	25·627	0	?	75·9	44·2	30·0	87·2	38·0	49·2	62·1	67·7	57·3	−4·4	41·8	53·0	56·3	50·3
Minicoy	29·989	29·885	·104	29·927	?	·862	88·1	79·9	8·1	90·6	75·4	15·2	85·0	86·2	83·8	?	75·2	78·5	79·4	77·7
Aden	·917	·801	·117	·859	− ·012	·886	84·1	75·0	9·1	89·7	70·7	19·0	80·7	81·8	79·0	0	70·4	74·0	72·4	72·3

* The hours of observations are 14 hours and 20 hours (in the case of winds 12 hours and 24 hours).

II—*concluded.*

in India, Burma, &c., in the month of March 1891—concluded.

Vapour tension.					Humidity.					Cloud.				Wind Direction.											Wind Steadiness		Wind Velocity.		Station.
														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.	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.	
·717	·793	·777	·763	−·006	93	72	71	79	− 3	5·4	5·6	5·5	+ 2·5	...	3	4	8	10	24	9	2	2	S. 15° E.	S. 38° W.	51	58	225	267	False Point.
·687	·711	·645	·682	+·023	87	63	49	66	+ 4	4·4	5·2	4·8	+ 2·4	1	2	10	7	9	17	10	3	3	S. 23° E.	S. 16° W.	34	43	61	82	Cuttack.
·571	·628	·576	·592	+·073	79	62	44	61	+ 11	3·9	3·7	3·8	+ 2·1	...	9	7	4	11	2	10	12	7	N. 74° W.	N. 88° W.	13	29	87	49	Sambalpur.
·493	·521	·448	·487	+·121	74	51	33	52	+ 15	3·6	4·5	4·0	+ 2·2	4	1	12	6	1	4	11	15	8	N. 79° W.	N. 79° W.	22	20	126	116	Raipur.
·253	·310	·312	·291	−·018	43	27	21	30	− 1	1·5	2·5	2·0	+ 0·3	...	11	13	...	2	1	4	14	17	N. 34° W.	N. 46° W.	53	48	127	112	Khandwa.
·325	·315	·322	·320	+·001	55	31	23	36	+ 3	1·3	3·0	2·2	+ 0·3	9	3	18	5	...	3	13	8	3	N. 16° W.	N. 55° W.	10	15	113	59	Hoshangabad.
?	·271	·268	?	?	?	29	22	?	?	1·8	2·5	2·2	+ 0·8	...	6	19	10	7	4	8	3	5	N. 63° E.	N. 53° W.	29	33	94	78	Saugor.
·386	·359	·321	·355	+·024	75	36	25	45	+ 7	1·6	3·4	2·5	+ 0·2	2	12	14	1	4	6	6	8	9	N. 18° W.	N. 69° W.	26	22	83	70	Jubbulpore.
?	·265	·248	?	?	?	32	27	?	?	2·3	4·2	3·2	+ 1·1	2	1	4	12	5	7	6	17	8	S. 58° W.	N. 57° W.	16	36	128	109	Pachmarhi.
Imperfect.																													Seoni.
·365	·470	·437	·420	+·088	52	42	30	41	+10	1·4	4·0	2·7	+0·2	1	5	10	9	7	11	10	5	4	S. 37° E.	N. 20° W.	16	6	143	108	Nagpur.
·555	·563	·502	·539	+·137	83	49	34	55	+16	1·7	3·8	2·7	+0·4	3	1	1	13	17	4	6	7	10	S. 33° E.	S. 52° W.	22	9	63	77	Chanda.
·621	·643	·530	·598	+·097	76	54	34	55	+10	3·2	3·8	3·5	+1·7	11	1	...	3	13	21	8	3	2	S. 4° E.	S. 2° W.	54	36	63	76	Sironcha.
·255	·317	·320	·275	−·022	45	38	33	33	0	2·5	5·2	3·8	+1·7	11	10	...	2	2	7	3	11	16	N. 63° W.	N. 53° W.	38	34	189	169	Chikalda.
·222	·243	·208	·217	−·075	35	23	16	23	− 5	1·1	2·0	1·6	−0·6	14	15	2	1	...	1	2	2	25	N. 31° W.	N. 28° W.	59	50	115	178	Buldana.
·279	·303	·281	·285	−·004	47	26	18	28	0	1·6	4·4	3·0	+1·6	1	5	4	4	5	...	3	8	32	N. 42° W.	N. 43° W.	54	44	135	104	Akola.
Not computed.										1·8	6·0	3·9	+0·5	...	18	1	12	3	20	8	...	...	S. 45° E.	N. 77° W.	21	39	?	?	Makhla.
·278	·216	·203	·232	−·084	50	21	16	25	− 5	3·7	4·7	4·2	+1·9	...	14	7	5	...	8	7	12	9	N. 47° W.	N. 88° W.	29	35	217	213	Deesa.
·573	·628	·639	·613	−·103	73	62	59	65	− 8	1·5	1·2	1·4	−0·4	...	8	5	4	3	2	...	5	35	N. 32° W.	N. 28° W.	61	55	300	272	Bombay.
·317	·243	·218	·270	−·053	58	22	14	28	− 1	1·6	1·8	1·7	−0·7	16	2	2	3	5	...	2	18	14	N. 69° W.	N. 41° W.	37	42	194	199	Poona.
·384	·446	·470	·433	+·108	56	35	27	38	+ 8	1·1	4·5	2·8	+0·3	...	6	6	12	3	...	2	20	13	N. 38° W.	N. 51° E.	32	9	157	181	Sholapur.
·550	·640	·685	·631	−·081	70	56	59	64	− 4	0·1	0	0	−0·6	...	19	2	...	2	2	4	5	28	N. 36° W.	N. 72° W.	68	60	227	231	Ratnagiri.
·702	·710	·737	·720	−·039	87	63	61	70	− 4	0·6	0·7	0·7	−0·9	...	...	...	...	...	...	...	31	31	N. 68° W.	N. 80° W.	92	70	81	?	Karwar.
·393	·303	·364	·375	−·033	69	27	28	42	+ 1	0·8	2·3	1·6	−0·5	...	5	6	4	4	3	9	15	7	N. 83° W.	S. 88° W.	29	8	252	279	Belgaum.
·513	·532	·492	·512	+·074	72	46	32	50	+10	2·2	4·4	3·3	+1·6	4	1	4	8	8	21	9	3	4	S. 9° E.	S. 63° E.	43	26	115	122	Secunderabad.
·681	·758	·771	·737	−·006	71	64	64	66	0	2·8	2·7	2·8	+0·9	...	1	...	1	9	33	10	7	1	S. 9° W.	S. 45° W.	73	58	48	67	Vizagapatam.
·489	·621	·522	·544	+·170	61	46	30	46	+13	0·6	2·0	1·3	−0·9	45	1	1	1	1	5	2	...	6	S. 70° W.	S. 26° E.	6	20	107	110	Bellary.
?	·784	·823	·796	+·032	?	60	80	76	+ 2	1·3	0·7	1·9	−0·5	...	...	...	8	41	13	...	...	...	S. 41° E.	S. 50° E.	90	81	144	151	Madras*.
·689	·765	·684	·713	+·093	89	65	40	65	+11	2·2	3·1	2·7	+0·6	...	...	24	26	7	5	...	...	...	N. 82° E.	S. 55° E.	78	42	91	132	Salem.
·451	·487	·486	·475	+·005	83	57	47	62	+ 1	5·4	5·5	5·4	+1·9	...	10	8	9	...	...	...	12	23	N. 23° W.	N. 42° W.	56	18	35	81	Mercara.
·708	·714	·577	·666	−·003	89	59	36	61	+ 2	3·4	2·8	3·1	−0·1	2	5	19	20	12	3	1	...	...	N. 81° E.	S. 85° E.	67	50	90	94	Trichinopoly.
·850	·864	·880	·865	+·026	92	68	67	76	+ 1	2·0	1·7	1·8	−1·1	17	2	1	1	...	...	9	20	12	N. 82° W.	N. 81° W.	54	47	?	?	Cochin.
·332	·346	·367	·348	+·018	86	51	53	63	+ 4	3·0	3·6	3·3	+0·4	3	1	4	9	33	11	1	...	...	S. 48° E.	S. 43° E.	75	65	50	66	Wellington.
·513	·661	·672	·615	−·065	69	59	57	62	−10	1·2	1·5	1·4	−0·6	...	26	12	2	1	1	1	1	18	N. 4° W.	N. 58° W.	72	26	100	91	Akyab.
·723	·779	·794	·764	−·012	91	69	69	77	+ 1	6·6	5·1	5·9	+3·6	...	18	...	...	...	1	...	7	36	N. 37° W.	N. 42° W.	86	85	154	189	Diamond Island.
·684	·729	·666	·693	+·021	88	62	43	64	0	1·0	1·2	1·1	−1·1	...	1	2	4	12	17	9	9	6	S. 13° W.	S. 22° W.	43	56	118	121	Rangoon.
·665	·842	·871	·793	−·038	92	70	65	75	− 2	3·1	3·1	3·1	−0·8	...	5	3	...	...	5	10	...	39	N. 55° W.	N. 53° W.	64	43	62	49	Mergui.
·770	·790	·787	·782	?	97	66	68	77	?	2·0	2·0	2·0	?	...	35	10	2	...	...	...	1	14	N. 11° W.	?	74	?	?	?	Cocos Island.
·787	·889	·902	·859	−·011	84	72	66	74	− 3	2·8	2·9	2·9	+0·1	...	4	19	16	22	...	...	...	1	N. 87° E.	N. 56° E.	72	69	104	101	Port Blair.
·164	·159	·132	·148	−·066	84	45	32	54	− 3	3·5	4·3	3·9	−0·3	32	3	1	...	1	2	1	10	12	N. 64° W.	S. 65° W.	32	36	50	111	Quetta.
·080	·116	·138	·111	+·012	80	70	66	72	+15	5·7	7·4	6·6	+0·2	6	2	9	5	2	8	19	9	2	S. 40° W.	S. 37° W.	28	18	18	50	Leh.
·241	·300	·327	·295	−·020	83	55	49	64	+ 2	4·5	5·5	5·0	+1·3	6	2	2	8	6	6	1	27	4	S. 74° W.	N. 78° W.	28	69	40	?	Katmandu.
·811	·891	·913	·871	?	80	74	73	76	?	3·4	3·4	3·4	?	1	11	4	1	...	...	...	11	32	N. 39° W.	?	62	?	152	?	Minicoy.
·687	·754	·675	·704	+·004	79	70	62	70	− 1	4·4	2·1	3·4	+0·1	...	...	7	38	7	4	2	...	...	S. 83° E.	N. 83° E.	75	73	355	359	Aden.

and the means are as given in the registers sent by the Government Astronomer, Madras.

Government of India Central Printing Office.—No. 33 Meteor.—3-9-91.—400.

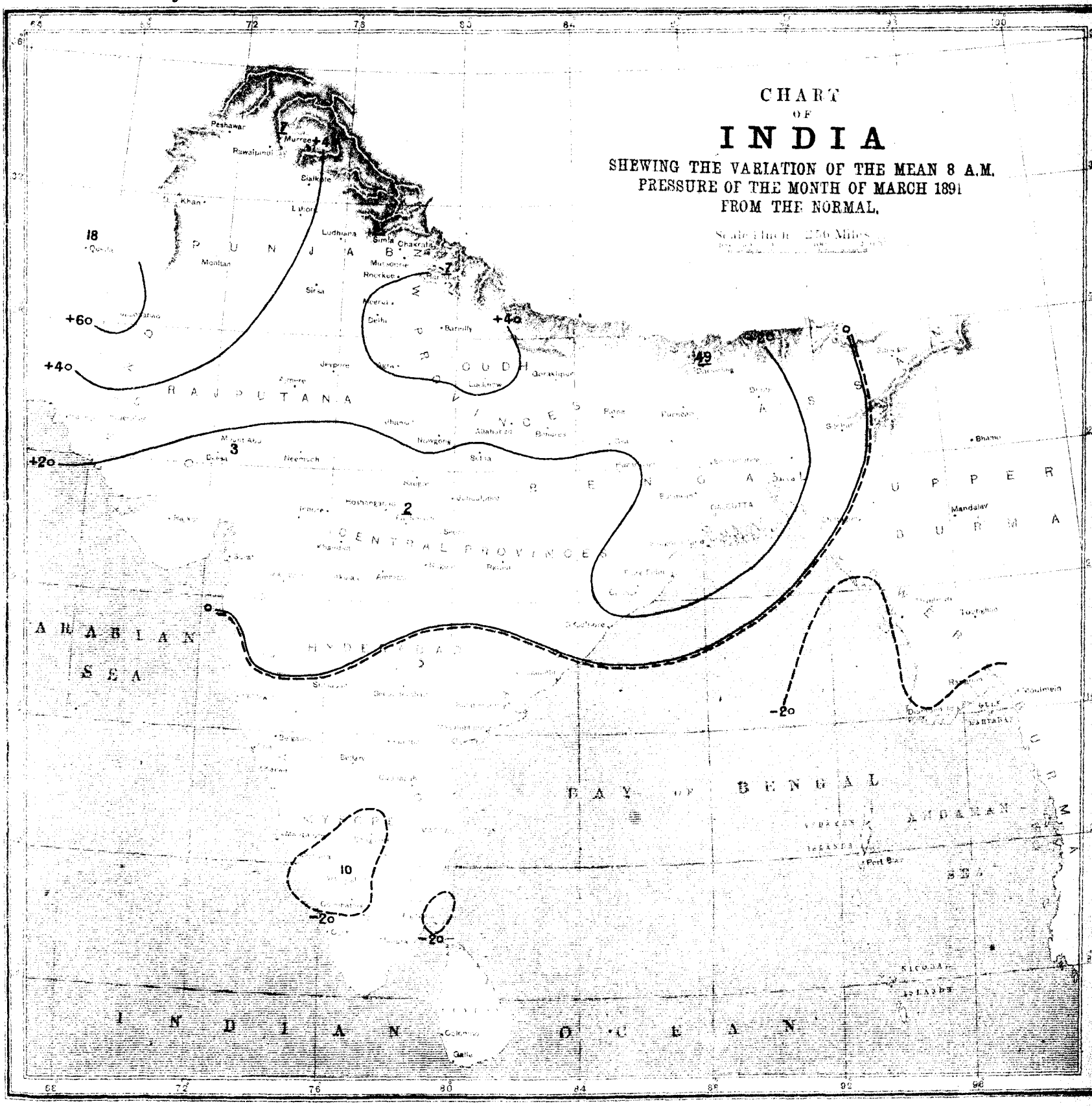
Explanation.

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 a difference 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 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.

Reg. No. 326, Wr., I.—Aug. 94.—415

Zinco., 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, &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 line. Two parallel lines near to each other, one continuous and the other broken, represent the line of no variation, the dotted line facing the area of deficient pressure or negative abnormals.

Reg. No. 378, Wr., I—Aug. 91—415.

Zinco., S. I. O., Calcutta.

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

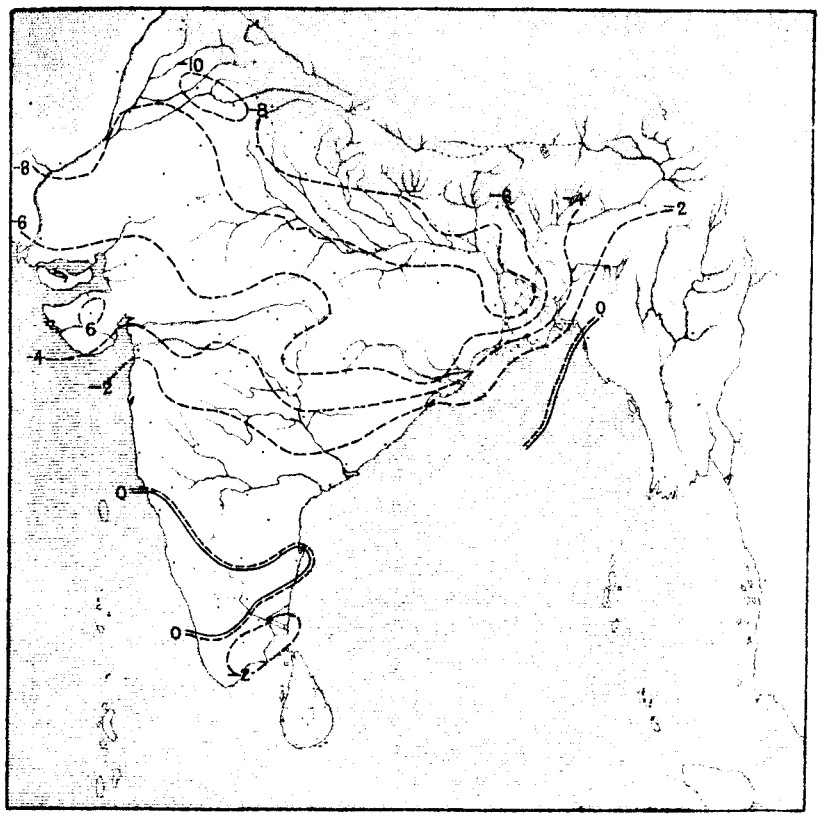
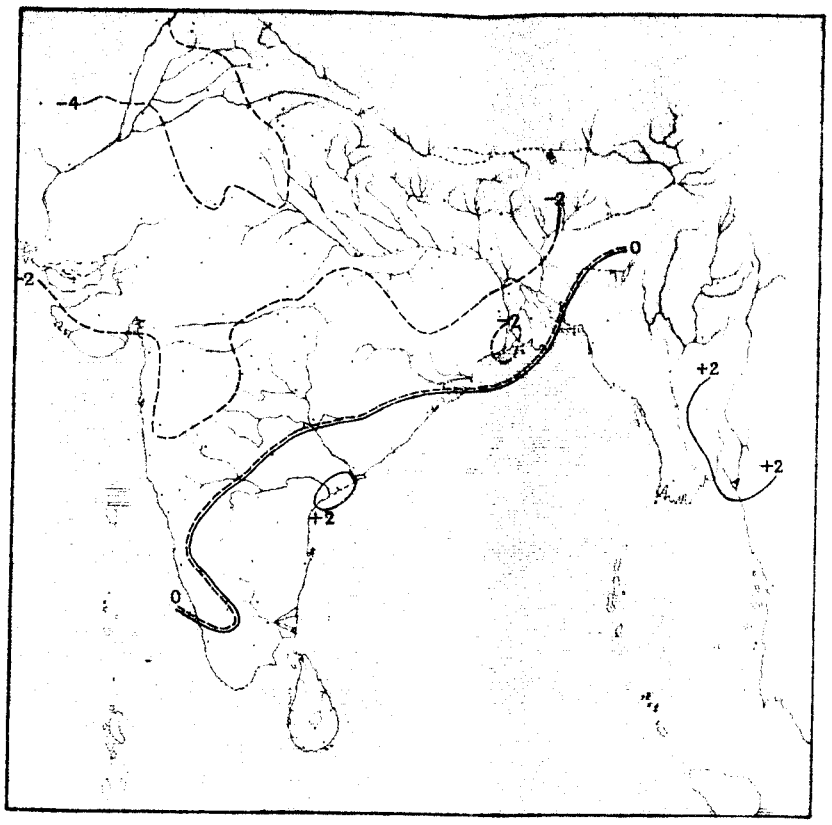


CHART SHEWING THE VARIATION OF THE MEAN MINIMUM TEMPERATURE OF THE MONTH FROM THE NORMAL.



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.

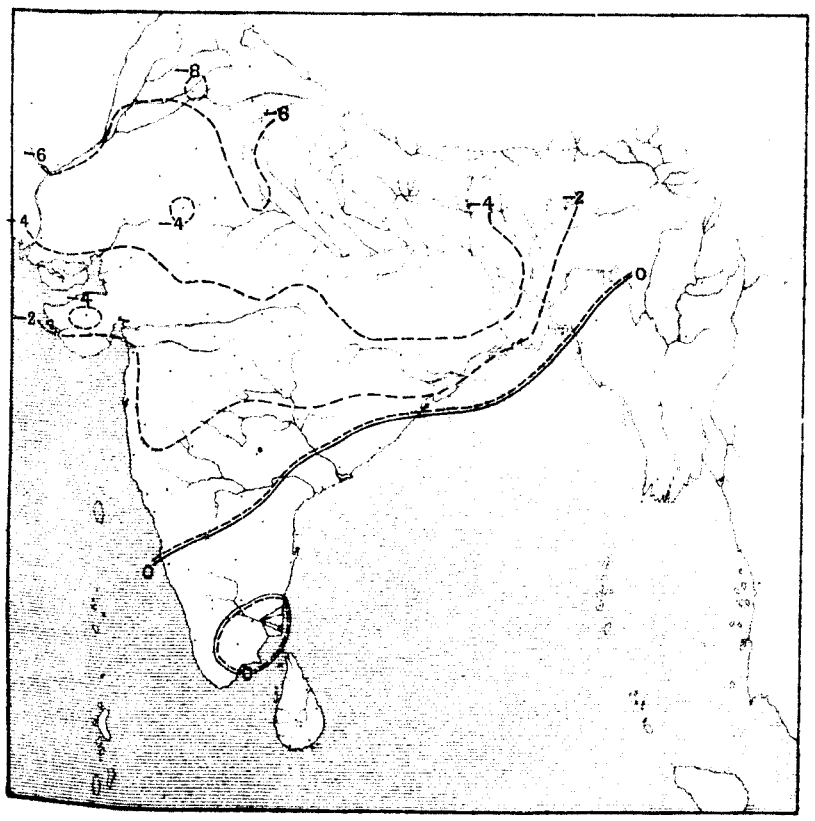
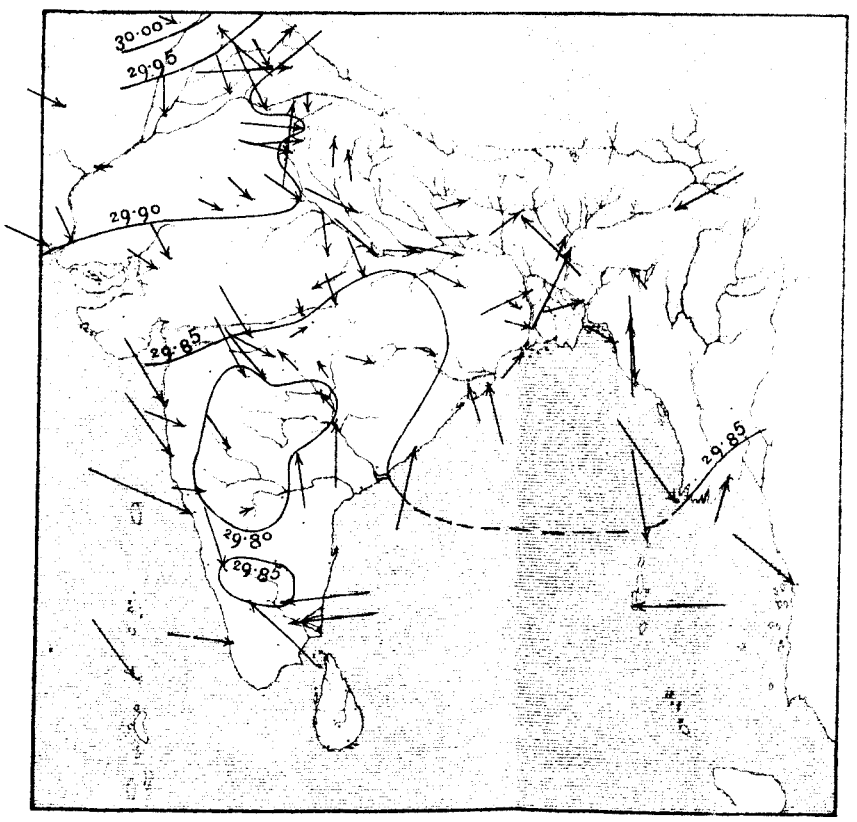


CHART SHEWING THE MEAN DISTRIBUTION OF PRESSURE AND THE RESULTANT WIND DIRECTIONS IN THE MONTH OF MARCH 1891.



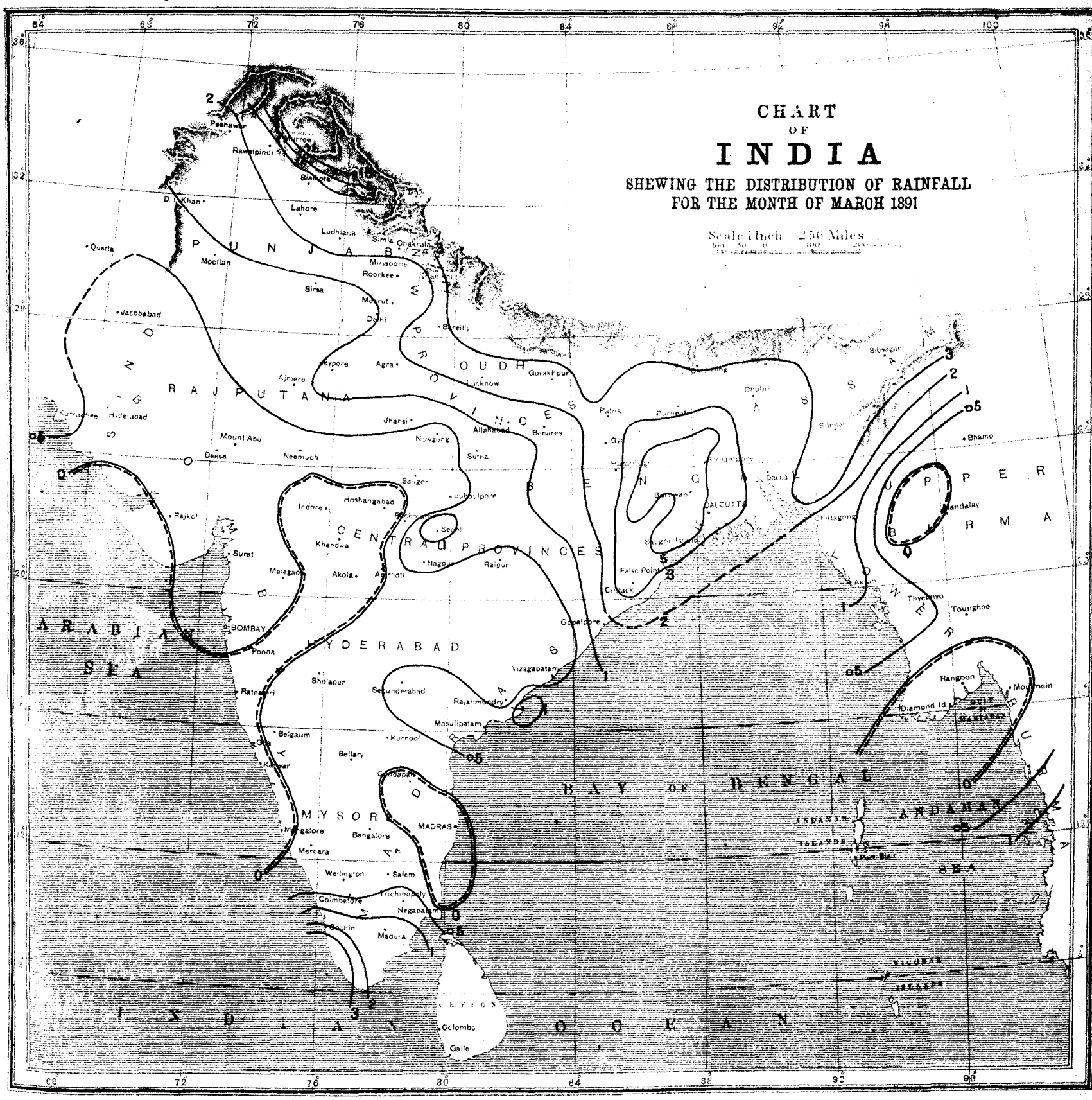
Explanation.

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 $\frac{5}{8}$th of an inch being equal to 100 per cent.

Reg. No. 328, Wr., I.—Aug. 91.—415.

Litho., S. I. O., 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. The double line or line of no rainfall separates areas in which the area 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. 398, Wr., 1.—Aug. 91.—415

Zinco., 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 exception of Upper the 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 51 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 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
3. Central do.
4. Upper do.
5. Arakan
6. Eastern Bengal
7. Assam (Surma)
8. Do. (Brahmaputra)
9. Delta Bengal
10. Central do.
11. North do.
12. Orissa
13. Chota Nagpore
14. Behar (South)
15. Do. (North)
16. North Western Provinces (East)
17. Oudh (South)
18. Do. (North)
19. North Western Provinces (Central)
20. Do. do. (West)
21. Do. do. (Submontane)
22. Punjab (South)
23. Do. (Central)
24. Do. (Submontane)
25. Do. (Hill Districts)
26. Do. (North West)
27. Punjab (West)
28. Malabar
29. Madras (South Central)
30. Coorg
31. Mysore
32. Konkan
33. Bombay Deccan
34. Hyderabad (North)
35. Khandeish
36. Berar
37. Central Provinces (West)
38. Do. (Central)
39. Do. (East)
40. Guzerat
41. Kattiawar
42. Sind
43. Central India (East)
44. Rajputana (East) Central India (West)
45. Rajputana (West))
46. East Coast (North)
46(a.) Do. do. (a)
47. Hyderabad (South)
48. Madras (Central)
49. East Coast (Central)
50. East Coast (South)
51. Madras (South)

GOVERNMENT OF INDIA.

METEOROLOGICAL DEPARTMENT.

MONTHLY WEATHER REVIEW,

PUBLISHED BY ORDER OF

THE GOVERNMENT OF INDIA.

CALCUTTA, APRIL, 1891.

INTRODUCTION.

THIS review of the weather in India during the month of April 1891 is based on observations taken at 8 A.M. daily at 158 stations, and on additional observations taken at 10 A.M. and 4 P.M. at 88 stations. The rainfall summary is based on the rainfall data of the meteorological observatories and of the rainfall telegrams received during the month from district officers throughout India. A summary of the snowfall reports received from district officers, giving information of the weather and snowfall in the mountain districts to the north and north-west of India, is also given. A brief summary of the weather in the Bay of Bengal and Arabian Sea has been drawn up from the meteorological data of the Bay of Bengal and Arabian Sea, collected from vessels entering the ports of Calcutta and Bombay.

Summary of the chief features of the weather in India during the month of April 1891.

April is the second month of the hot-weather period or season in Northern and Central India. The most important meteorological feature of the month is the more or less steady increase of temperature which occurs during the month. At the end of March the area of maximum temperature covers the Central and North Deccan. The mean temperature in that area at that time averages 92°. Temperature increases about 10° in Upper India, 5° in Central India, and remains practically unchanged in Ceylon and Southern India. Hence the area of maximum temperature is slowly transferred northwards, and at the end of the month includes the North Deccan, the Central Provinces and the adjacent districts of South Behar, the North-Western Provinces and Central India. The mean temperature in that area at the end of the month usually slightly exceeds 92°, and maximum temperatures exceeding 110° are generally registered at the hotter and drier stations in it before the end of the month.

The increase of temperature in India during the month produces a corresponding change in the distribution of pressure. Pressure falls rapidly in Northern India, and more especially in Upper and Central India, and the area of minimum pressure is usually transferred northwards to North-Western India during the month. Pressure at the end of the month is highest in the coast districts and adjacent sea areas, but the gradients are small, except in the neighbourhood of the coast and at the time of greatest heat during the day, when steepish gradients obtain over a narrow belt near the coasts. These afternoon gradients are steepest in the west coast districts and the Bengal and Orissa coasts.

Local sea winds or land and sea breezes prevail in the

coast districts. In the interior of Northern India and Burma the winds blow down the river plains and valleys. The westerly winds of the Gangetic plain are usually of considerable intensity and of high temperature. The air motion over the greater part of the interior occurs chiefly during the day hours, the nights being generally almost calm.

One of the important meteorological features of the month is the hot-weather depression area which usually covers the eastern districts of the Central Provinces and Chutia Nagpur. It is usually a permanent feature of the month and is generally more pronounced at 4 P.M. than at 8 or 10 A.M. It is almost certainly a product, and not the cause, of the system of converging winds which obtain at this time in North-Eastern India, *viz.* westerly winds in the Gangetic plain, easterly winds in Assam and North Bengal, and southerly winds in Bengal and Orissa.

The chief disturbances of the month belong almost exclusively to the class of hot-weather storms. They are usually accompanied with thunder and rain or hail in the coast districts and near the hills of Northern and Southern India. In the drier districts of North-Western India they usually give no rain and belong to the class known as dust-storms.

Thunderstorms are of most frequent occurrence in Assam and Bengal, more especially the eastern and northern districts, and these provinces hence receive a considerable amount of rain during the month. Southern India and Tenasserim also obtain moderate rain during the month, and the rainfall in these areas appears to be, in part at least, occasionally due to brief temporary advances of moist southerly winds from the equatorial belt.

April 1891 was, on the whole, more free from disturbance than usual. The thunderstorms and nor'westers, which occurred during the disturbed weather, were less violent in Bengal than is sometimes the case, and no tornadoes are reported.

Fine dry weather obtained generally in Northern India until the 7th. The weather was disturbed in Upper India from the 7th to the 15th, due to the formation of two shallow depressions in Beluchistan or Sind, and their advance eastwards across Upper India to the foot of the hills. The Punjab and adjacent hills received light to moderate thundershowers during these two disturbances. Numerous thundershowers occurred in Southern India on the 8th, 9th and 10th, in the interval between the two depressions in Upper India, and again on the 18th and 19th. From the 1st to 20th weather was unusually quiet and free from disturbance in North-Eastern India, but on the 20th the hot-weather depression, which had previously occupied a very abnormal position in North and Central Behar, was transferred southwards to Chutia Nagpur and the adjacent districts of the Central Provinces. From that date to the end of the month thunderstorms were of daily occurrence in Assam and the greater part of Bengal, and moderately heavy rain was hence received.

Thunderstorms and duststorms occurred in North-Western India on the 27th, 28th and 29th, and thunderstorms in Southern India on the 29th and 30th, during a period of slight general disturbance chiefly indicated by irregular barometric changes over India.

As the month was less disturbed than usual over the greater part of India, the rainfall of the month was generally below the normal. There was a slight excess, of little importance, in Malabar, South India, the Deccan, the Central Provinces and Berar. The rainfall of the month was below the normal in all other districts, the deficiency being greatest in Assam, North Bengal, the Carnatic, Tenasserim and Burma. The following table gives a brief statement of the average rainfall and its variations from the normal in the eleven meteorological provinces:—

METEOROLOGICAL PROVINCE.	Average actual rainfall of month.	Average normal rainfall of month.	Variation.
Burma Coast	0·44″	2·46″	−2·02″
Burma, Inland	0·88	0·98	−0·10
Assam	7·97	9·58	−1·61
Bengal and Orissa	2·29	2·58	−0·29
Gangetic Plain and Chutia Nagpur	0·04	0·43	−0·39
Upper Sub-Himalayas	0·39	0·66	−0·27
Indus Valley and North-West Rajputana	0·55	0·39	+0·16
Rajputana, Central India and Guzerat	0·06	0·13	—0·07
Deccan	0·62	0·30	+0·22
West Coast	1·55	1·21	+0·34
South India	1·03	0·73	+0·30

The snowfall information indicates that little or no snow fell in the Afghan highlands, and that frequent snow fell in the North-Western Himalayas. The snowfall in the latter area, although heavy, does not appear to have been of the same excessive character as in the previous three months.

The effect of the snow accumulation in the mountain districts to the north of India in reducing temperature was hence less than in the previous month. The mean maximum, or day, temperature was below the normal in Northern and Central India and the Deccan, but the deficiency was large only in the Punjab, where it ranged from 2° to 5°. It was in moderate excess in Assam and Burma. The minimum, or night, temperature was in defect in Northern India, but the deficiency was small, except in the Punjab, where it ranged from 1° to 4°. There was a considerable excess in Burma, greatest in the central and eastern districts.

The mean temperature of the month was below the normal in the Punjab, the North-Western Provinces, Behar, Orissa, Chutia Nagpur, the eastern districts of Rajputana, Central India, the Central Provinces and South Madras. The deficiency exceeded 2° in the North and East Punjab, and was greatest at Lahore (—4·7°). Temperature was most largely in excess in Burma, and the mean of the month at Toungoo and Moulmein was 2½° above the

normal. The following table gives temperature data for the large meteorological provinces:—

District.	Variation of		
	Mean maximum temperature from normal.	Mean minimum temperature from normal.	Mean temperature from normal.
	°	°	°
Burma Coast	+1·4	+0·9	+1·2
Burma, Inland	+0·9	−1·1	−0·1
Assam	+1·5	−0·6	+0·5
Bengal and Orissa	+0·8	−0·5	+0·2
Gangetic Plain and Chutia Nagpur	−1·1	−1·4	−1·1
Upper Sub-Himalayas	−2·9	−2·6	−2·8
Indus Valley	−0·8	−0·4	−0·6
East Rajputana, Central India and Guzerat	−0·3	+0·3	0
Deccan	−0·4	+0·3	−0·1
West Coast	0	−0·4	−0·2
Southern India	0	0	0

As the weather in April was more free from disturbance than usual, winds were abnormally steady and considerably stronger than usual in the Punjab, North-Western Provinces, Behar and Chutia Nagpur. The westerly winds which prevailed in the Gangetic plains were continued into Central Bengal and gave an unusual amount of westing to the winds in that area, but caused winds at the coast stations of Saugor Island and False Point to be more directly from the south than usual. In North-Western and Western India winds were, as is generally the case in April, from north-west, but they were very steady and drier than usual. These dry winds extended further east into the Deccan and south along the Malabar coast than usual, thus showing the influence of the excessive pressure conditions in North-West India and Beluchistan in modifying the character and extent of these winds. There were no noteworthy features in the winds of the month in Southern India and Burma.

The air was considerably drier over the whole of Northern India with the exception of the Punjab. The deficiency was most marked in Behar and Chutia Nagpur. There was, on the other hand, more vapour in the air over the Central Provinces and the Deccan, and the excess was large at several stations in the Deccan, including Sholapur, Secunderabad, and Bellary, where it exceeded 15 per cent. There was less vapour in Burma, the west or Bombay coast districts, and Sind, but the variations were not large or important except in Sind and the North Bombay coast and Aden, where they are undoubtedly due to the unusual dryness of the northerly winds due to a larger outflow of air than usual from the countries to the west of the Punjab. There was more cloud at the great majority of stations. The only exceptions were the Assam and Burma stations, where there was a general deficiency. The following gives comparative aqueous vapour pressure, humidity and cloud data for the ten meteorological provinces:—

Division.	Variation of Cloud Amount.			
	Aquerous vapour pressure from normal.	Relative humidity from normal.	Actual.	Variation from normal.
Burma Coast and Bay Islands	−·034	−4	3·2	−0·5
Assam	−·028	−3	4·7	0
Bengal and Orissa	−·030	−6	3·3	+0·2
Gangetic Plain and Chutia Nagpur	−·037	−3	1·8	+0·2
Upper Sub-Himalayas	−·005	+3	3·5	+1·0
Indus Valley and North-West Rajputana	+·015	+2	3·5	+1·0
East Rajputana, Central India and Guzerat	+·027	+2	3·0	+1·1
Deccan	+·030	+2	2·9	+0·5
West Coast	−·008	−1	1·8	−0·5
South India	+·016	+1	3·9	+0·1

Atmospheric Pressure.

The distribution of mean 8 A.M. pressure for April is shown by means of two charts. The first chart (Plate I) gives the distribution of the mean 8 A.M. 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 ·05″ or $\frac{1}{20}$th of an inch. The second chart (Plate II) gives the variations of the actual mean pressure from the normal pressure. These values are obtained from the barometric readings reduced for temperature only. A small chart, No. 4 of Plate III, gives the distribution of the monthly mean daily pressure and of the mean winds, in the same form and manner as in the monthly charts given hitherto in the annual reports on the meteorology of India. The data on which this chart is based are given in Table II. The more important barometric changes and movements during the month are fully given in the following statement of the barometric depressions of the month.

The data that are chiefly used in this discussion are the 8 A.M. reduced observations and the variations derived from a comparison of these observations and the normal values given in Table I. The means in the third column of that table are not only reduced or corrected to sea-level but also to constant gravity. The normal means are obtained from the observations of the period 1878—88, and, in order that the means and variations may be strictly comparable, the means have been calculated for observations of the same period in all cases.

The mean pressure of the month for the whole of India was above the normal, as it had been since January 1891. The following gives the variations for the whole Indian

area for the month of April and the preceding five months :—

MONTH.	General pressure anomaly.
April 1891	+·028″
March 1891	+·015″
February 1891	+·022″
January 1891	+·005″
December 1890	—·001″
November 1890	+·041″

Relative'y to the general condition, pressure was in defect in North-Eastern India, Burma, the south of the Peninsula, North Madras and Orissa. The local deficiency was small in amount except in Assam and North Bengal.

The following gives data of the largest negative anomalies in that area :—

STATION.	Negative anomaly.
Sibsagar	—·065″ (?)
Dhubri	—·021″
Jalpaiguri	—·024″
Dinagepur	—·045″ (?)

Pressure was locally more or less in excess in North-Western and Central India and the Deccan. The positive anomalies exceeded ·02″ in the Punjab and Upper Sind, and were actually greatest in the Indus Valley at the following stations :—

STATION.	Positive anomaly.
Peshawar	+·040″
Dera Ismail Khan	+·025″
Mooltan	+·029″
Jacobabad	+·026″

Pressure was as largely above the average at the hill stations as at the neighbouring plain stations in Upper India :—

HILL STATION.	Variation of mean pressure of month from normal.	PLAINS STATION.	Variation of mean pressure of month from normal.
Quetta	+·069″	Jacobabad	+·054″
Leh	+·040″	Lahore	+·052″
Murree	+·034″	Rawalpindi	+·051″
Ranikhet	+·027″	Bareilly	+·030″
Chakrata	+·057″	Roorkee	+·033″
Pachmarhi	+·043″	Hoshangabad	+·025″

Hence the following features of the pressure distribution have been very persistent since the beginning of the year :—

(1) Pressure was generally in excess by amounts which increased from the beginning of the year.

(2) Pressure was relatively in excess in North-Western and Central India, the excess being greatest in the Indus Valley.

(3) Pressure was relatively in defect in the greater part of the Peninsula, North-Eastern India and Burma. The deficiency was greatest and most marked during March and April in Assam.

The only important change during the month in the pressure distribution was the increase of pressure at the hill stations. It had been considerably below the normal during the cold-weather months, but in April it was largely above it, and now exhibited the same features as at the neighbouring plains stations.

The barometer fell steadily on the 1st, 2nd and 3rd over the whole of India, and on the 4th pressure was lowest in Behar and the adjacent districts. A brisk rise occurred on the 5th over the whole of India. Gradients were very small, but a very shallow low-pressure area lay along the foot of the hills over North Bengal and Behar. A brisk fall of the barometer in Upper India on the 6th preceded the appearance of a shallow depression in Sind, which advanced eastwards on the 7th across Rajputana to the foot of the hills on the 8th, where it was absorbed in the low-pressure area there, which had been a feature of the weather for some days previously.

The depression gave rise to some duststorms on the plains of Upper India and some light rain showers on the hills.

Weather was disturbed in Southern India from the 8th to the 11th. The barometric changes were somewhat irregular from day to day. This was the only barometric indication of the disturbance, which gave some excessively heavy thundershowers. Thus Madura on the 9th had a fall of 6·5 inches during a thunderstorm. The chief feature in the distribution of pressure during the next ten days was a shallow depression which covered North Bengal and Behar. It was, however, apparently only the ordinary hot-weather depression of North-Eastern India, displaced from its normal position in Chutia Nagpur northwards into Behar.

In Upper India the effect of rapidly increasing temperature was to give a shallow depression running across from Upper Sind to the foot of the Simla and Kumaon hills. This feature was very prominent on the 11th and 12th, on both of which days thundershowers and duststorms occurred over a large part of the Punjab, and again on the 14th and 15th, more especially on the latter day, when a local depression lay over the Simla hills and adjacent plains districts. Light to moderate thundershowers were received over the whole of the north and east of the Punjab on the 14th. A very rapid rise of pressure followed the rainfall of the 15th in North-Western India and obliterated the Upper India low-pressure belt for a brief period. Weather was slightly disturbed in Southern India on the 18th and 19th, and Malabar and Travancore received numerous thundershowers. The only barometric indication was

a slight irregularity in the changes of pressure from place to place.

From the 16th to the 20th the barometric movements over the whole of India were large and somewhat irregular, and a few local thunderstorms of little importance occurred in various parts of India, more especially in South Madras. The Upper India low-pressure belt was re-established on the 18th. A change occurred in the distribution of pressure in North-Eastern India on the 20th, due to a large fall in West Bengal and Chutia Nagpur, as compared with North Bengal and Behar. In consequence of this change the low-pressure area in North Bengal and Behar was transferred to West Bengal and Chutia Nagpur. It remained practically unchanged in position from the 21st to the 26th. During this period the whole of Bengal and Assam (more especially the eastern districts of Bengal and Silchar) had frequent thunderstorms, which gave a general and heavy burst of rain. Falls varying from 2 to 4 inches occurred at many stations in East and South Bengal.

The barometric changes were very irregular on the 27th, 28th and 29th, and local depressions were shown in Sind, the South-East Punjab, the south-eastern districts of the North-Western Provinces and Chutia Nagpur. Numerous dust and thunderstorms occurred in various parts of Northern and Central India, which gave moderate rain, chiefly to Assam, Bengal, and the eastern and northern districts of the Punjab and the western districts of the North-Western Provinces.

At the end of the month pressure was approximately uniform, the only important feature in the distribution being a very shallow depression in Chutia Nagpur and South Behar, which continued to determine thundershowers in Bengal. This depression was the ordinary hot-weather depression of North-Eastern India, and occupied practically its normal position at this period.

The month of April was hence almost entirely free from large barometric disturbances in India, and the observations at Leh, Bushire and Quetta show that the same was the case in the districts to the north and west of Upper India.

Summary of the reports of the weather and snowfall in the mountain districts to the North and North-West of India.

The reports received from the Punjab district officers of the snowfall in the mountain districts bordering Upper India show that heavy snow fell over the North-Western Himalayas and the accumulation in that area due to the excessive snowfall of the previous three months was hence almost as large as in the preceding two months. Heavy snow appears to have fallen during the month on the Sufed Koh and the neighbouring high ranges in Afghanistan, and it is almost certain, from the character of the storms of the first fortnight, that excessive snow must have fallen on the Hindu Kush and high mountain ranges to the north of Afghanistan and Kashmir. The chief stormy periods in the mountain districts were on the 7th to the 10th and from the 13th to 17th, but the reports indicate that snow fell almost daily on the higher elevations of the Punjab and North-Western Provinces Himalayas.

I.—The Afghan Highlands.

The only snowfall information received respecting this area for the past winter is that upwards of 40 feet of snow fell during the winter at Cabul and that the amount is unprecedented, no such snowfall having occurred according to the statement of the oldest inhabitants during the past fifty years.

II.—The Punjab and Kashmir Himalayas.

(*a*) *Ladakh.*—The Reverend Mr. Redslob, Superintendent of the Observatory at Leh, writing on the 3rd May, describes the weather in Ladakh during the past winter in the following terms: "The amount of snow which fell at any time during the winter was not large, never exceeding half a foot. We had, however, far more frequent falls than usual, and the whole valley was white with snow for over a fortnight, which is a very rare thing with us. On the adjacent higher hills heavy snow has fallen. Some people tried to cross the Karakorum pass in February, but found so much snow lying (over 9 feet) that they had to return. The snow is unusually low down on the neighbouring hills, and the cold at night is still severe. The villagers in the Upper Sutlej Valley near the Chinese frontier were not able to begin ploughing until nearly the end of March, over a month after the usual time."

(*b*) *Lahoul.*—The Reverend Mr. Heyde, Superintendent of the Observatory at Kailang, sends full information of the weather in Lahoul. In his first letter, dated 14th March, he writes: "The winter set in unusually early at the end of November, and has been so far a very severe one. The chief characteristic of the present winter was the strong and almost storm-like winds which accompanied the heavier falls of snow. This was especially the case on the 25th December, 16th and 17th of January, and 1st, 2nd, 26th and 27th of February. Clear sunny days were very rare, and hence the fallen snow has not melted away in the intervals between the storms, as is usually the case, and there is at present upwards of 4 feet of snow lying in the valley."

The letter was written on the 14th March in the hope that the passes into Kulu would open at the usual time. It

was not possible to send it off until the second week of April, and Mr. Heyde adds in a postscript that 4 feet more of snow had fallen during that interval.

In his second letter of the 23rd May he states that the passes by which communication is kept open with Kulu had been twice closed after the despatch of the previous letter. They are usually open for the season from the middle of March, but this year they were passable for the first time in the second week of April. They were closed again from the 21st of April to the 8th of May in consequence of heavy snowfall, and again from the 10th to the 20th of May, on which day the second dâk of this season was sent across.

The ploughing of the fields, which was begun a fortnight later than usual, was interrupted by this heavy fall, and it is feared the season will now be too short to permit of the ripening of the crops.

(c) *Kulu.*—The Assistant Commissioner, Kulu, has sent very full and interesting information of the weather during the month of April in his district. The following tables give the whole of this information, together with similar information for the corresponding month of 1888-1889 and 1890:—

Kulu District.

Name of Pass.	Height.	Reported Depth of Snow during April			
		1891.	1890.	1889.	1888.
	Ft.	Ft.	Ft.	Ft.	Ft.
Rotang	13,000	10	6	15½	4
Hamta	14,500	?	8	13	3
Chandar Khani	?	10	3	7	5
Barsai	?	5	3	1½	1
Bujadhur	?	4	3½	1	2
Lori Achri	?	3	2	3	3
Pushtari	?	3	½	1	*Nil.*
Bhubhu	10,000	5	1½	2	4
Majang	?	*Nil*	½	*Nil*	*Nil.*

Plach District.

Name of Pass.	Height.	Reported Depth of Snow during April			
		1891.	1890.	1889.	1888.
	Ft.	Ft.	Ft.	Ft.	Ft.
Chul	?	4	2	1	1
Sirigarh	15,000	36	17	55	14
Maghian	?	4	2	2	1
Tikkar	?	4	...	...	...
Dundku	?	7	4	2	3½
Ramgarh	?	?	...	...	...
Nanun	?	2	*Nil*	*Nil*	*Nil.*
Jalori	10,500	4	1	1	*Nil.*
Raghopur	?	5	2	1	*Nil.*
Hinuri	?	4	1	1	*Nil.*
Sakiran	?	5	1	?	?
Suphakun	?	12	5	1	5
Gargarasan	17,000	12	8	2	7
Bashleo	11,000	4	2	2	1
Plach	?	7	6	?	2
Tirath	?	10	7	11	7

The snow melted steadily throughout the month, but there were falls of snow on the higher elevations on the 7th, 8th, 11th, 12th, 15th, 22nd and 28th. On the 28th snow fell down to 10,000 feet. The Hamta pass was closed and the Rotang pass practically closed at the end of the month, although several natives of Lahoul crossed it in the last week, but with much difficulty. These facts and the data given in the preceding tables show that there was much more snow lying on the mountains at the end of April 1891 than there has ever been at the same time of year since the systematic reports of snowfall were commenced (in 1883). The winter is, according to popular opinion, the latest and most severe that has been experienced for many years.

III.—The North-Western Provinces Himalayas.

Garhwal.—The Senior Assistant Commissioner, Garhwal, states that from the information obtained from hill men, it appears that the snowfall during the past winter in the northern parts of Garhwal is at least four times the usual amount. Painkhanda is the most northern pargana of the district, and from Painkhanda the Niti and Mana passes lead into Thibet. These passes have been closed since the 16th September, and not a week has passed without snow falling on the higher mountains. It is not expected that these passes will be open before August next.

No snowfall reports have been received from the district officers of Kumaon in the North-Western Provinces and Darjeeling in Bengal.

IV.—Assam Himalayas.

The Assistant Political Officer, Sadiya, states that the snowfall in the neighbouring Himalayas was later than usual, but was about the same in amount as in the preceding year.

The Extra Assistant Commissioner, Darrang district, Tezpur, states that as far as he can ascertain from the various hill tribes to the north of his district, there was less snowfall this year than in the previous year. This is fur-

ther confirmed by the Chardner Bhutia Sub-Rajas, who said unusually heavy showers of rain were received, and there was in consequence a good harvest, but that there was less snow than usual.

The Sub-divisional Officer of Koriapara also states that the snowfall to the north of his district was somewhat less than usual.

The Deputy Commissioner of Kamrup states that there were so few Bhutias in Durranga this year that he did not make much enquiry about the snowfall. The men whom he asked said that there had been a good deal of snow, and, so far as he could understand, above the average.

Summary of Special Storm Reports.

The following gives a statement of the chief local storms of which reports were received during the month. On the whole the month was much more free from storms than usual, and none were recorded of abnormal violence. The whole of the storms recorded were of the ordinary hot-weather type, *viz.* thunderstorms with heavy rain or hail in Southern India, Bengal and the North-Western Provinces, and thunderstorms or duststorms in the drier and hotter parts of the country.

There were three periods of disturbance, *viz.* from the 7th to the 10th, from the 12th to the 14th, and from the 20th to the end of the month :—

The following storms during the first period, which lasted from the 7th to the 10th, were reported.

7th.—Thunderstorms at Baghdad (3-15 to 3-45 P.M.), Roorkee (4 to 5 P.M.), Akola, Khandwa (5-45 P.M. to 8 P.M.), Jubbulpore and Sutna (9 to 9-30 P.M.), and hailstorm at Chikalda.

8th.—Thunderstorms at Khandwa and Sutna.

9th.—Thunderstorm at Akola (11 P.M. to midnight) and hailstorm at Pedong (4 to 6-20 P.M.).

The chief storms during the second period were the following:—

12th.—Violent hailstorm at Comillah at 5-30 P.M. Many of the hailstones weighed 8 ounces.

14th.—Hailstorm at Belgaum at 7 P.M. Thunderstorms at Lahore (7 to 9 P.M.) and Poona (5 P.M.).

A large number of storms occurred during the third period, of which the following are the most important:—

20th.—Severe duststorm at Hyderabad (Sind) from 4-30 to 6-25 P.M. (average wind velocity was 70 miles an hour).

21st.—Duststorm at Hyderabad (Sind) from noon to 2-50 P.M., (average wind velocity was 35 miles an hour).

22nd.—Severe duststorm at Hyderabad from 10 A.M. to noon (average velocity of wind 50 miles an hour). Hailstorm at Jessore at 3-40 P.M. The storm is stated to have come up from the east. Duststorm at Lahore from 3 to 6 P.M.

23rd.—Duststorm at Hyderabad (Sind) from 5-30 to 11 P.M.

24th.—Duststorm at Hoshangabad (8-40 to 9 P.M.).

25th.—Violent hailstorm at Khandwa from 4 to 5-15 P.M. Thunderstorm at Nagpur from 4 to 5 P.M.

26th.—Duststorms at Jacobabad at 4 P.M. and Allahabad at 5 P.M.

27th.—Thunderstorm at Raipur (4-15 P.M. to 5 P.M.) Duststorm and thunderstorm at Hazaribagh at 5-30 P.M.

28th.—Hailstorm at Lahore from 5-40 to 10 P.M.

29th.—Hailstorm at Berhampore (5 P.M. to 5-30 P.M.)

30th.—Thunderstorm at Jessore at 7-15 P.M., with violent winds, which did much damage to property. Thunderstorm with very strong winds at Dhubri at 6 P.M. (average wind velocity during the storm was 40 miles per hour).

Weather in the Bay of Bengal and Arabian Sea.

The weather in the Bay of Bengal to the north of about Lat. 8° N. was fine, with light to fresh north-east winds, throughout the month, except near the Bengal and Madras coasts, where winds ranged from S. E. to S. W.

To the south of Lat. 8° N. squalls were of occasional occurrence. For example, the ship *Walden Abbey* in Lat. 2° S. and Long. 86° 46′ E. on 2nd had very nasty squalls from north-west with heavy rain. The S. S. *Monmouth* in Lat. 6° 16′ N. and Long. 79° 24′ E. on the 18th had strong squalls from north with heavy rain.

The weather was even finer on the greater part of the Arabian Sea than in the Bay of Bengal. Thunder and rain squalls were experienced off the Malabar Coast and in the neighbourhood of the Equator.

Temperature of the Air.

The distribution of temperature in India in April 1891 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. The continuous lines indicate that the temperature was in excess by the amount indicated in each case by the number given near the line, and the broken lines that it was in defect by the amounts indicated by the numbers placed near the lines. 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 data by means of which these charts have been prepared are given in Table I. The normal mean maximum and minimum temperatures have been obtained for each station from the observations of the same number of years, *viz.* 1878 to 1888. 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 amounts which vary from month to month. But the variation of the mean daily temperature from the normal as determined by the use of this definition agrees in almost all cases very closely with the variation, as determined by the use of true daily means based on readings at 16 hours, in addition to those 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.

In consequence of the prevalence of very settled weather in April, temperature increased somewhat more rapidly than usual, but not to so large an extent as to undo the effect of the preceding severe winter in Upper India and the mountain area to the north. Hence both the mean maximum and minimum temperatures of the month were below the normal in Northern India, but to a less degree than in the month of March. On the other hand, they were in excess to an even larger extent at the Burma stations and in some parts of the Peninsula in April than in the preceding two months.

The mean maximum, or day, temperature of the month was above the normal in Bombay, Mysore, Madras, and the greater part of Bengal, Assam and Burma. The variation exceeded 2° at Dhubri (+3·2°) and Silchar (+2·7°), and also, probably, at Rangoon and Burrisal, but the observations in April at these two stations were not very satisfactory or reliable.

The mean maximum, or day, temperature was below the normal over the whole of North-Western and Central India and the greater part of the Deccan, but the deficiency was small in amount, except in the Punjab, where it ranged from 2° to 5°. The deficiency exceeded 4° in the area represented by the following stations :—Lahore (—4·6°) and Rawalpindi (—4·5°).

The mean minimum, or night, temperaturew as in defect in Northern India, and in excess in Burma, Sind, Rajputana and nearly the whole of the Peninsula. The variations exceeded 2° in the North and East Punjab and in Lower Burma. The following gives data for these two areas :—

Area.	Station.	Variation of mean minimum temperature of the month from the normal.
		°
North and East Punjab	Peshawar	—2·3
	Rawalpindi	—3·0
	Sialkot	—3·5
	Lahore	—4·8
	Ludhiana	—2·1
	Meerut	—2·2
	Roorkee	—3·0
Burma	Toungoo	+3·8
	Moulmein	+3·1
	Akyab	+2·4

The Central Provinces, Berar, the Deccan, Upper Sind and Central Burma were the hottest areas in India during the month. Maximum temperatures exceeding 110° were registered at the following stations :—

Province.	Station.	Highest maximum temperature registered during the month.
		°
Sind	Jacobabad	111·3
Berar	Amraoti	111·3
Central Provinces	Nagpur	110·3
Burma	Mandalay	110·4

The mean temperature of the month was above the normal in the Peninsula, Sind, West Rajputana, East Bengal and Burma, and was below it in other districts. The variations were less than 2° in amount in all districts, except the North and East Punjab and the eastern hal of Lower Burma. In the former of these areas the mean temperature of the month was more than 2° below the normal, and in the second more than 2° above it. The variations at representative stations in these two areas are given in the following table :—

Area.	Station.	Variation of mean temperature of month from the normal.
North and East Punjab.	Peshawar	—2·9
	Lahore	—4·7
	Rawalpindi	—3·8
	Sialkot	—3·6
	Ludhiana	—2·6
	Delhi	—2·3
	Roorkee	—2·3
Lower Burma	Toungoo	+2·6
	Moulmein	+2·5

Temperature at the commencement of the month was very considerably below the normal of the period over the whole of Northern and Central India. The following gives

the temperature variations of the larger provinces for the 1st of the month :—

District.	Variation of		
	Mean maximum from normal of day.	Mean minimum from normal of day.	Mean from normal of day.
	°	°	°
Burma	+1·7	—0·5	+0·6
Bengal and Assam	—3·2	—6·9	—5·1
North-Western Provinces	—5·6	—8·2	—6·9
Punjab	—1·2	—1·4	—1·3
Bombay	+0·6	—2·1	—0·8
Central Provinces	—5·3	—6·2	—5·8
Guzerat and Central India	—2·6	—5·0	—3·8
Sind and Rajputana	+0·2	—1·9	—0·9
Madras	—0·6	—1·0	—0·8

Temperature increased steadily until the 7th and 8th, when it was generally above the average, except in the East Punjab, Behar, and the Central Provinces. The excess on the 8th and 9th was greatest in the West Punjab and Assam, in which it ranged from 4° to 6°. Local thundershowers in Southern India reduced temperature on the 10th from 2° to 10° below the normal. Temperature increased rapidly in Southern India on the 11th and 12th, and changed slightly and irregularly in other districts. The temperature conditions at this period are shown by the following data for the 12th :—

District.	Variation of		
	Mean maximum from normal of day.	Mean minimum from normal of day.	Mean from normal.
	°	°	°
Burma	+1·4	—0·7	+0·4
Bengal and Assam	+0·8	+0·5	+0·7
North-Western Provinces	—0·6	+2·9	+1·2
Punjab	—1·7	+0·9	—0·4
Bombay	+0·2	—0·2	0
Central Provinces	+2·5	+2·2	+2·4
Guzerat and Central India	+2·9	+2·5	+2·7
Sind and Rajputana	+4·2	+6·2	+5·2
Madras	—0·9	—0·3	—0·6

Temperature was hence above the normal over by far the greater part of the country, the excess being most marked in Upper Sind and West Rajputana, more especially at Ajmere (+9·0°), Sambhar (+9·1°), and Jacobabad (+8·3°).

A cool wave appeared on the North-West Frontier on the 15th. It extended slowly eastwards, and covered nearly the whole of Northern India on the 18th and 19th. The following gives the variations of the mean temperature from the normal at certain stations illustrating the progress of this wave :—

Date.	Station.	Variation of mean temperature of day from normal.
		°
14th	Jacobabad	+6·
	Dera Ismail Khan	+2·6
15th	Quetta	—9·6
	Dera Ismail Khan	—9·1
16th	Rawalpindi	—11·2
	Lahore	—10·6
17th	Lahore	—11·0
	Sambhar	—8·7
18th	Allahabad	—8·3
19th	Benares	—6·2

This cool wave followed a brief period of rain in the East Punjab and snow in the Kashmir Himalayas on the 14th.

Temperature increased rapidly on the 20th, 21st and 22nd in North-Western and Central India.

The following table gives the temperature variations of the 22nd in different parts of India :—

District.	Variation of		
	Mean maximum from normal of day.	Mean minimum from normal of day.	Mean from normal of day.
	°	°	°
Burma	+0·1	—0·7	—0·3
Bengal and Assam	+1·1	—1·5	—0·2
North-Western Provinces	+1·3	—3·7	—1·2
Punjab	+2·3	+5·6	+4·0
Bombay	+0·7	—0·8	—0·1
Central Provinces	+0·8	+0·3	+0·6
Guzerat and Central India	+1·4	—1·8	—0·2
Sind and Rajputana	+2·5	+4·8	+3·7
Madras	0	+0·9	+0·5

During the remainder of the month, weather was disturbed with frequent thunderstorms in North-Eastern India and South Madras, and in the East Punjab. The temperature variations were mainly determined by these conditions, and temperature was generally more or less below the average in all districts except Burma, more especially on the 28th, 29th, and 30th. The following data giving the variations of the 29th show the large effect of moderate scattered

rain in reducing temperature below the normal in the hot weather :—

District.	Variation of		
	Mean maximum from normal of day.	Mean minimum from normal of day.	Mean temperature from normal of day.
	°	°	°
Burma	+2·3	+1·1	+1·7
Bengal and Assam	−1·2	+0·6	−0·3
North-Western Provinces and Oudh	−5·2	−4·1	−4·7
Punjab	−13·9	−10·9	−12·4
Hill Districts in Upper India	−12·5	−13·5	−13·0
Malabar Coast and Mysore	+0·9	+0·2	+0·6
Bombay	−0·6	−3·8	−2·2
Central Provinces	−3·4	−1·9	−2·7
Guzerat and Central India	−3·2	−0·4	−1·8
Sind and Rajputana	−6·7	−0·9	−3·8
Madras	−1·2	0	−0·6

Winds.

The mean wind directions at 8 A.M. during the month are shown in Plate I by arrows flying with the wind. They are obtained by the use of Lambert's formula, in which an equal value is given to every wind. The data are given in Table I. The mean wind directions derived from the wind observations at 10 A.M. and 4 P.M. are given in the small chart No. 4 of Plate III by means of arrows flying with the wind. The data for these will be found in Table II, together with the normal direction as obtained from the observations of the past 10 to 20 years.

The normal winds in April are from north-west to west in the Gangetic plain and Central India and the greater part of the Deccan. Easterly winds blow down the Assam valley, and southerly winds (with more or less westing) across the Bengal coast. Land and sea breezes prevail on the Madras and Bombay coasts.

As might be anticipated from the abnormal pressure conditions, unusually steady westerly winds prevailed during the month of April 1891 in the Gangetic plain and Central India. The winds were also more directly from the west than usual, and on the average of the month stronger. The following gives data for five representative stations in Northern India in illustration of these facts :—

Station.	Direction.		Steadiness.		Velocity.	
	Mean wind direction, April 1891.	Normal mean wind direction, April.	Percentage, April 1891.	Average percentage, April.	Daily wind velocity, April 1891.	Normal daily wind velocity, April.
Lahore	N. 44° W.	N. 19° W.	41	26	61(?)	80
Roorkee	N. 81° W.	N. 73° W.	77	10	77	76
Allahabad	N. 62° W.	N. 52° W.	61	25	114	84
Patna	N. 82° W.	N. 38° W	58	27	114	107
Hazaribagh	N. 70° W.	N. 74° W.	70	49	254	201

One effect of these stronger and steadier westerly winds than usual in the Gangetic plain was to give an abnormal amount of westing to the winds in Central and East Bengal. Also, in accordance with the experience of the past three years, when winds in April and May are stronger and more westerly than usual in the Gangetic plain and Central Benga, winds are more directly from the south on the Bengal and Orissa coasts. The following gives data for five stations in illustration :—

District.	Station.	Direction.		Steadiness.		Velocity.	
		Mean wind direction, April 1891.	Normal mean wind direction.	Percentage, April 1891.	Average percentage, April.	Mean daily wind velocity, April 1891.	Normal mean daily wind velocity, April.
Central and East Bengal.	Burdwan	S. 68° W.	S. 40° W.	44	40	110	113
	Calcutta	S. 42° W.	S. 3° W.	72	73	130	177
	Dacca	S. 4° W.	S. 4° E.	80	60	212	163
West Bengal and Orissa coasts.	Saugor Island	S. 14° W.	S. 30° W.	88	76	434	401
	False Point	S. 6° W.	S. 38° W.	90	79	346	332

In Rajputana, Central India and at the Bombay coast stations north-west winds prevailed, due to the excessive pressure conditions at the head of the Arabian Sea and in Beluchistan. They formed, in fact, one of the most prominent and important features of the meteorology of the month. The abnormal extension of these dry north-west winds southwards is shown by the following data :—

Station.	Direction.		Steadiness.		Velocity.	
	Mean wind direction, April 1891.	Normal mean wind direction, April.	Percentage, April 1891.	Average percentage, April.	Mean daily wind velocity, April 1891.	Normal mean daily wind velocity, April.
Bombay	N. 67° W.	N. 52° W.	65	55	250	271
Sholapur	N. 49° W.	N. 18° E.	25	14	201	203
Belgaum	N. 35° W.	S. 88° W.	23	25	?	314
Cochin	N. 60° W.	N. 82° W.	82	55	81	?

Winds were stronger and much steadier in the Central Provinces. They were normal in direction and strength in Southern India and Burma, but were generally steadier.

The mean wind direction at Port Blair was S. 69° E., the normal being N. 81° E.

Humidity and Cloud.

The hygrometric data for 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 the minimum of the vapour tension and humidity at the same hours, and also the daily means of these elements. The hygrometric data are taken from the tables given in the *Vade-Mecum* which are 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 five to twenty 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 five to twenty-five years of the available cloud data for the same hours.

It has already been pointed out that temperature increased more rapidly than usual, and that the dry land westerly winds of the month were stronger and much steadier during the month in Northern India. Hence the air contained on the average less vapour than usual over the whole of Northern India excepting the Punjab, where the weather was more disturbed, with occasional storms and periods of rain. The deficiency was most marked in Behar and Chutia Nagpur, although the air was on the average not so warm as usual. The relative humidity was also more or less largely in defect in the same areas. The following gives data for four stations in Behar, Chutia Nagpur and West Bengal :—

Station.	Aqueous Vapour Tension.		Humidity.	
	Mean actual, April 1891.	Variation from normal.	Mean actual, April 1891.	Variation from normal.
Patna	·375	−·092	32	− 9
Hazaribagh	·249	−·049	22	− 7
Calcutta	·726	−·085	60	−11
Berhampore	·588	−·038	50	− 9

The air contained on the average somewhat more vapour than usual in the Punjab, and in consequence of the low mean temperature the relative humidity was considerably in excess. The mean humidity of the month was 10 above the normal at Lahore and Mooltan, where the excess was greatest.

The aqueous vapour pressure and humidity were both in slight to moderate excess in the Central Provinces and Behar. There was a very large and remarkable excess in the amount of vapour present in the air at several stations in the Deccan, more especially at the following :—

Station.	Aqueous Vapour Pressure.		Humidity.	
	Mean actual, April 1891.	Variation from Normal.	Mean actual, April 1891.	Variation from Normal.
Sholapur	·504	+·134	36	+7
Secunderabad	·594	+·111	46	+8
Bellary	·549	+·078	40	+5

The air was damper than usual in the Deccan, and also in South and East Madras, but to a less extent than in the Deccan. The air was drier in Burma, and also in the West Coast districts, Kattiawar and Sind, thus showing clearly the origin of the north-west winds, which were so prominent a feature of the meteorology of the month in that area. The following gives data for three representative stations in Sind and Western India, and for Aden, to which the same features extended :—

Station.	Aqueous Vapour Pressure.		Humidity.	
	Mean actual, April 1891.	Variation from Normal.	Mean actual, April 1891.	Variation from Normal.
Hyderabad	·378	−·126	32	−10
Bombay	·775	−·042	72	−3
Poona	·312	−·067	26	−4
Aden	·715	−·063	66	−4

There was more cloud than usual over the whole of India with the exception of Assam and Burma and some local areas in Western India. The variations were, however, much smaller than in the preceding month. The following gives average data for the ten meteorological provinces :—

Meteorological Province.	Cloud Amount.		
	Average actual, April 1891.	Normal average, April.	Variation from normal.
Burma Coast and Bay Islands	3·2	3·7	−0·5
Assam	4·7	4·7	0
Bengal and Orissa	3·3	3·1	+0·2
Gangetic Plain and Chutia Nagpur	1·8	1·6	+0·2
Upper Sub-Himalayas	3·5	2·5	+1·0
Indus Valley and North-West Rajputana	3·5	2·5	+1·0
East Rajputana, Central India and Guzerat	3·0	1·9	+1·1
Deccan	2·9	2·4	+0·5
West Coast	1·8	2·3	−0·5
Southern India	3·9	3·8	+0·1

Rainfall.

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

The charts illustrating the distribution of rainfall in April 1891 are based in part upon the rainfall data of the meteorological observatories throughout India, and in part on the rainfall information relating to the month telegraphed to Simla by district officers.

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 155 meteorological stations.

The distribution is shown by means of isohyetic lines, or lines of equal amounts of rainfall, the numbers attached to each line indicating the rainfall.

Over a considerable portion of the country no rain fell. The line of no rainfall is indicated by two parallel lines, separated by a short interval, one continuous and the other dotted, the latter facing the districts of no rainfall.

The second chart illustrating the distribution of the rainfall of the month is given in Plate V, and shows by figures the variations of the mean actual rainfall of the month from the normal rainfall in each of the 51 meteorological districts into which India and Burma have been divided for purposes of comparing crops and rainfall. The data of that chart are derived from the rainfall information telegraphed by district officers, and of which a summary is given in the following table :—

DISTRICT.	Average actual rainfall of month.	Average normal rainfall of month.	Variation from normal.
Burma	0·40	2·44	−2·04
Assam	6·99	11·63	−4·64
Bengal and Behar	1·13	2·10	−0·97
North-Western Provinces and Oudh	0·05	0·19	−0·14
Punjab	0·54	0·78	−0·24
Bombay and Malabar coast districts	1·81	1·47	+0·34
Central Provinces and Berar	0·47	0·32	+0·15
Bombay, North	0·08	0·10	−0·02
Rajputana and Central India	0·02	0·10	−0·08
Madras	0·68	0·98	−0·30

The rainfall of the month of April in India is usually small in amount, and is generally due to local storms. Two areas, as a rule, receive moderately heavy rain during this month. The first is Assam and the greater part of Bengal, where thunderstorms are of almost daily occurrence and frequently give very heavy showers. The second area is Southern India, and more especially Malabar and Travancore, which receive frequent showers, sometimes from local thunderstorms and sometimes from brief and partial advances of southerly moist winds—the forerunner of the winds of the south-west monsoon.

Light thundershowers were received by many stations in the Central Provinces on the 1st. From that date until the 6th the weather was dry and rainless over India. A shallow depression entered Sind on the 8th and advanced eastwards to the North-Western Provinces Himalayas, but it gave no rain except in the Simla and North-Western Provinces hill districts. Immediately afterwards weather became disturbed in Southern India, and heavy thundershowers occurred on the 8th, 9th and 10th in Travancore, Malabar, Coimbatore, Madura, Tinnevelly and Coorg. Assam also received frequent light thundershowers during this period. Amongst the more remarkable falls in Southern India were the following :—

Date.	STATION.	Amount of fall.
9th	Madura	6·55 inches.
"	Calicut	3·03 "

A depression appeared in Sind on the 10th and advanced eastwards to the foot of the hills, where it disappeared on the 12th, but left the weather slightly unsettled for upwards of two days afterwards in Behar and Chutia Nagpur. The eastern and northern districts of the Punjab and the hill districts received light to moderate showers from the 12th to the 15th. This was followed by the appearance of a very shallow depression in the south of the Peninsula on the 16th. It did not concentrate, and, after giving numerous thunderstorms over the south and centre of the Peninsula on the 16th and 17th, it disappeared.

On the 20th, weather became disturbed in North-Eastern India, and thundershowers occurred daily from the 20th to the 26th or 27th over the whole of Bengal and Assam. The largest falls during this period were recorded in East and North Bengal. The greatest fall during the period was 3·85 inches at Comilla on the 27th. A period of slight general disturbance followed over the whole of Northern India. The Punjab received fairly general rain on the 27th, 28th and 29th, the western districts of the North-Western Provinces on the 28th and 29th, and Bengal on the 29th and 30th. During this last week of the month a series of occasional thunderstorms also visited Southern India, but the accompanying rainfall was very partially distributed, and small in amount.

The following statement gives rainfall data of the 51 rainfall divisions of the Empire for the month of April :—

PROVINCES.	DIVISION.	Average actual rainfall of Division, 1st to 4th April 1891.	Average actual rainfall of Division, 5th to 11th April 1891.	Average actual rainfall of Division, 12th to 18th April 1891.	Average actual rainfall of Division, 19th to 25th April 1891.	Average actual rainfall of Division, 26th to 30th April 1891.	Total rainfall during the month.	Average normal rainfall during the month.	Variation from normal.
		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
BURMA	Tenasserim	0	0·29	0	0·27	0	0·56	4·19	—3·63
	Lower Burma	0	0	0	0	0	0	1·76	—1·76
	Central Do.	0	0	0	0·09	0·02	0·11	1·37	—1·26
	Upper Do.	0	0·04	0·09	0·15	0·14	0·42	?	?
	Arakan	0	0	0	0·80	0·14	0·94	2·42	—1·48
BENGAL AND ASSAM.	Eastern Bengal	0	0·27	0·05	2·19	2·13	4·64	4·15	+0·49
	Assam (Surma)	0	1·32	3·03	1·25	2·70	8·30	15·29	—6·99
	Do. (Brahmaputra)	0	0·33	1·79	1·45	2·11	5·68	7·97	—2·29
	Deltaic Bengal	0	0	0	0·49	0·99	1·48	3·04	—1·56
	Central Do.	0	0	0	0·42	0·44	0·86	1·96	—1·10
	North Do.	0	0	0	0·86	0·84	1·70	4·19	—2·49
	Orissa	0	0	0·01	0·05	0·12	0·18	1·42	—1·24
	Chutia Nagpur	0	0	0	0·01	0·03	0·04	0·61	—0·57
	Behar (South)	0	0	0	0	0	0	0·38	—0·38
	Do. (North)	0	0	0	0·01	0·10	0·11	1·02	—0·91
NORTH-WESTERN PROVINCES AND OUDH.	North-Western Provinces (East)	0	0·03	0	0	0·01	0·04	0·12	—0·08
	Oudh (South)	0	0·08	0	0	0	0·08	0·15	—0·07
	Do. (North)	0	0	0	0	0·01	0·01	0·19	—0·18
	North-Western Provinces (Central)	0	0·02	0	0	0·03	0·05	0·09	—0·04
	North-Western Provinces (West)	0	0·06	0·02	0	0·02	0·10	0·15	—0·05
	Do. Do. (Submontane)	0	0	0	0	0·04	0·04	0·43	—0·39
PUNJAB	Punjab (South)	0	0	0·01	0	0·16	0·17	0·31	—0·14
	Do. (Central)	0	0·01	0·01	0	0·08	0·10	0·30	—0·20
	Do. (Submontane)	0	0	0·04	0	0·26	0·30	0·55	—0·25
	Do. (Hill Districts)	0	0·02	0·37	0	0·94	1·33	1·83	—0·50
	Do. (North-West)	0	0·04	0·48	0	0·48	1·00	1·24	—0·24
	Do. (West)	0	0	0·08	0·04	0·20	0·32	0·47	—0·15
BOMBAY AND MALABAR COAST DISTRICTS (MADRAS).	Malabar	0	1·33	0·85	0·71	0·81	3·70	2·81	+0·89
	Madras (South Central)	0	1·36	0·19	0·13	0·64	2·32	2·08	+0·24
	Coorg	0	1·81	0·05	0·17	1·41	3·44	2·31	+1·13
	Mysore	0	0·78	0·35	0·32	0·35	1·80	1·76	+0·04
	Konkan	0	0·08	0·07	0·24	0·04	0·43	0·22	+0·21
	Bombay, Deccan	0	0·24	0·38	0·33	0·04	0·99	0·81	+0·18
	Hyderabad (North)	—	—	—	—	—	—	—	—
	Khandeish	0	0	0·01	0·01	0	0·02	0·28	—0·26
CENTRAL PROVINCES AND BERAR.	Berar	0	0·31	0·08	0	0·01	0·40	0·20	+0·20
	Central Provinces (West)	0·06	0·29	0·02	0	0·11	0·48	0·22	+0·26
	Do. (Central)	0·08	0·05	0	0·03	0·06	0·22	0·31	—0·09
	Do. (East)	0·17	0	0	0·11	0·49	0·77	0·55	+0·22
BOMBAY (NORTH).	Guzerat	0·10	0	0	0	0	0·10	0·01	+0·09
	Kattiawar	0	0	0	0	0·01	0·01	0·14	—0·13
	Sind	0	0	0	0	0·12	0·12	0·16	—0·04
RAJPUTANA AND CENTRAL INDIA.	Central India (East)	0	0·01	0	0·01	0·01	0·03	0·09	—0·06
	Rajputana (East), Central India (West)	0	0	0	0	0·03	0·03	0·10	—0·07
	Rajputana (West)	0	0	0	0	0	0	0·11	—0·11
MADRAS	East Coast (North)	0	0	0	0·33	0·15	0·48	0·82	—0·34
	Do. (Do.) (a)	0	0·15	0·00	0·50	0·15	1·00	?	?
	Hyderabad (South)	0	0	0·54	0·22	0·03	0·79	0·68	+0·11
	Madras (Central)	0	0·01	0·20	0·05	0·21	0·47	0·67	—0·20
	East Coast (Central)	0	0	0	0	0·05	0·05	0·11	—0·06
	Do. (South)	0	0·18	0·02	0·01	0·02	0·23	1·36	—1·13
	Madras (South)	0	1·34	0·08	0·38	0·23	2·03	2·24	—0·21

It shows in the first place that the only areas in which the normal rainfall of the month exceeds one inch are Burma (excepting Upper), Bengal and Orissa, North Behar, Malabar, Mysore, Coorg and South Madras, the hill districts in Upper India, and the North Punjab. Over the greater part of the country the rainfall is small in amount and of no importance.

The last column shows that the rainfall of the month was below the normal over the whole country except East Bengal, Malabar, Coorg, Mysore, the North Deccan, the Central Provinces and Madras (South Central). The only area in which the excess was considerable was Coorg, where 1·13 inches were received above the normal amount. The deficiency was large in Burma, over the greater part of which no rain was received, and in Assam and Bengal.

The following table gives data for these areas:—

Province.	Division.	Rainfall. Average actual rainfall during the month.	Average normal rainfall during the month.	Variation from normal.
Burma	Tenasserim	0·56	4·19	—3·63
	Lower Burma	0	1·76	—1·76
	Central Do.	0.11	1·37	—1·26
	Upper Do.	0·42	?	?
Assam	Arakan	0·94	2·42	—1·48
	Surma	8·30	15·29	—6·99
	Brahmaputra	5·68	7·97	—2·29
Bengal	Deltaic Bengal	1·48	3·04	—1·56
	Central Do.	0·86	1·96	—1·10
	North Do.	1·70	4·19	—2·49
	Orissa	0·18	1·42	—1·24
	North Behar	0·11	1·02	—0·91

Explanation of Tables.

Table I gives an abstract of the meteorological observations at 8 A.M., daily, taken at 158 stations in India during the month of April 1891.

In this table the observing stations are grouped under two sets of divisions. According to the first arrangement India and Burma are divided into eleven large meteorological areas or provinces. These divisions have been selected in consultation with the Medical Department. The climatic conditions of each area are fairly uniform, and they hence are presumed to form suitable areas for the discussion of the relations between disease and meteorology. The names of these divisions are printed in bold type, and the mean variations of the more important meteorological data, more especially temperature, are given opposite to each in prominent figures.

Each of these larger divisions is subdivided into smaller meteorological areas or districts, of which there are 51 in all. This subdivision was made in consultation with the Revenue and Financial Departments. In each of these smaller areas the distribution and character of the rainfall are fairly uniform and the staple crops in each are hence the same. This subdivision will, it is hoped, enable a more exact comparison to be made between crops and rainfall than has been hitherto possible.

The headings of the columns in the great majority of cases explain themselves. The figures in the third column "Variation from normal" are obtained by taking in each case the difference between the mean actual barometer (reduced for temperature but not to sea-level, or constant gravity) and the normal means obtained from the observations of the eleven years' period 1878—88.

The "mean daily temperature" is assumed in table I to be the mean of the maximum and minimum. It is chiefly utilized in order to obtain the mean variation of the temperature of the month from the normal.

In obtaining the figures for the column headed "Number of rainy days," a rainy day is assumed to be one on which a fall of a tenth of an inch or upwards has been recorded. A fall of less than a tenth of an inch is practically of no value for agricultural purposes in India, and it has not been found possible to secure the accurate record of rainfalls of less than a tenth of an inch at a great majority of the rainfall-recording stations.

Table II gives an abstract of the observations recorded at 10 A.M., and 4 P.M., at 88 second class observatories throughout India, Burma and the adjacent regions. This table is intended in part to supplement Table I, and hence information given in full in the latter table, as for example rainfall, is not included in Table II. This table is intended to give for the month, so far as is possible, all the information furnished hitherto in the Appendix A of the Annual Report on the Meteorology of India. The methods of calculating the means have been very fully explained in the Annual Reports, to which the reader is referred for complete information. The data of the mean daily pressure, the figures of which are given in the sixth column, are the means of the 10 and 16 hours' observations, with corrections obtained from a comparison of the 10 and 16 hours' observation of the same or a neighbouring observatory, with a series of hourly observations at the same observatory.

The mean temperature is calculated by the formula mean $= \frac{\textit{maximum} + \textit{16 hours} + \textit{2 minimum}}{4}$ by applying a constant correction for each month, derived from the hourly observations of the same or of a neighbouring station.

The mean daily vapour tension and humidity are the averages of the values for 10 A.M., 4 P.M., and the minimum readings, and the mean daily cloud is the average of the mean amounts for 10 and 16 hours.

The mean wind directions for each month are the trigonometrical resultant of the winds given under each of the eight cardinal points, and are calculated by means of Lambert's formula, in which an equal weight or value is given to every wind.

It should be noted that in the preceding discussion, in speaking of the maximum, minimum, or mean temperature, the total amount of wind, or the rainfall of a given day, as for example the 5th, the maximum, &c., of the 24 hours preceding 8 A.M. of the 5th is meant. This definition has been adopted to avoid confusion. As the observations are taken at 8 A.M., a part of them refer to 8 A M. of that day and a part to the previous 24 hours, and, therefore, including a portion of the previous civil day. It is found most convenient to use the same date to designate and define both classes of observations.

Table

Abstract of observations taken at 8 A.M. at 158 stations

Meteorological Province or District.	Station.	Height of Station 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.
Burma Coast and Bay Islands.		...	...	+·021	...	...	...	...	...	...	...	95·5	+1·4	75·9	+0·9	85·7	+1·2	19·6	...	...	...	...	27·9
Bay Islands	Port Blair	61·16	29·880	?	29·872	25·951	9th	29·789	3rd	·162	83·6	94·3	?	79·0	?	86·7	?	15·3	95·9	26th	76·1	3rd	19·8
Tenasserim	Mergui	96·27	29·843	?	29·869	29·921	9th	29·743	3rd	·178	82·8	93·2	?	71·4	?	82·3	?	21·8	98·1	19th	68·0	21st	30·1
	Tavoy	26·26	29·958	?	29·917	30·027	20th	29·863	3rd	·164	81·1	95·3	?	73·7	?	84·5	?	21·6	98·2	19th, 20th & 28th.	68·2	11th & 12th.	30·0
	Moulmein	93·79	29·846	+·028	29·879	29·963	9th	29·731	3rd	·232	82·4	96·1	+1·8	78·7	+3·1	87·4	+2·5	17·4	99·4	19th & 29th.	71·3	22nd	28·1
	Toungoo	181·1	29·722	+·020	29·846	29·815	9th	29·619	3rd	·196	84·0	101·5	+1·3	76·9	+3·8	89·2	+2·6	24·6	104·7	19th	72·2	4th	32·5
Lower Burma	Rangoon	40·69	29·892	+·023	29·871	30·007	9th	29·778	3rd	·229	80·0	100·3	+2·4	75·8	0	88·1	+1·2	24·5	104·2	20th & 28th.	72·9	4th	31·3
	Bassein	21	29·905	+·025	29·864	30·016	9th	29·790	3rd	·226	81·8	97·5	+1·8	74·6	−0·5	86·1	+0·7	22·9	100·7	20th	70·9	3rd	29·8
	Diamond Island	41	29·900	+·016	29·878	30·002	9th	29·788	3rd	·214	83·5	89·4	+0·8	75·2	−3·3	82·3	−1·3	14·2	91·3	4 dates	72·0	9th	19·3
Arakan	Akyab	20·44	29·902	+·014	29·867	29·986	9th	29·804	3rd	·182	82·7	92·0	+0·2	78·0	+2·4	85·1	+1·3	14·0	98·1	3rd	68·1	4th	30·0
Burma, Inland		...	...	+·030	...	...	...	...	...	...	...	99·7	+0·9	72·5	−1·1	86·1	−0·1	27·2	...	...	...	...	43·8
Central Burma	Thayetmyo	134	29·753	+·030	29·830	29·839	9th	29·671	3rd	·168	84·2	103·9	+0·9	74·3	−1·1	89·1	−0·1	29·6	107·7	16th & 30th.	65·9	3rd	41·8
Upper Burma	Mandalay	?	29·621	?	?	29·705	8th	29·516	25th	·189	82·9	103·0	?	79·0	?	91·0	?	24·0	110·4	17th	67·7	1st	42·7
	Kindat	?	29·523*	?	?	29·606	20th	29·429	17th	·177	76·0*	97·6*	?	69·0*	?	83·3*	?	28·6	104·7	18th	60·0	9th	44·7
	Bhamo	?	29·462	?	?	29·539	10th	29·362	14th	·177	73·5	94·2	?	67·6	?	80·9	?	26·6	104·6	18th	58·5	3rd	46·1
Assam		...	...	−·006	...	...	...	...	...	...	...	87·7	+1·5	68·0	−0·6	77·9	+0·5	19·7	...	...	...	...	34·5
Assam (Surma)	Silchar	104·3	29·789	+·013	29·846	29·872	28th	29·670	14th	·202	75·0	90·3	+2·7	68·5	−0·4	79·4	+1·2	21·8	96·1	6th	58·3	2nd	37·8
Brahmaputra	Sibsagar	333	29·516	−·037?	29·812	29·576	28th	29·416	14th	·160	69·7	81·4	−1·3	66·1	−0·2	73·8	−0·8	15·3	88·6	24th	62·3	1st & 3rd.	26·3
	Dhubri	115·34	29·722	+·007	29·793	29·781	1st	29·581	14th	·200	74·5	91·5	+3·2	69·5	−1·2	80·5	+1·0	22·0	101·5	17th	62·1	2nd	39·4
Bengal and Orissa		...	...	+·016	...	...	...	...	...	...		94·7	+0·8	73·5	−0·5	84·5	+0·2	22·0	...	...	...	...	37·2
East Bengal	Chittagong	86·70	29·814	+·015	29·849	29·884	9th	29·745	14th	·139	79·8	90·0	+1·6	73·0	−0·5	81·5	+0·6	17·0	94·7	5th	65·3	23rd	29·4
	Lungleh	?	?	?	?	?	?	?	?	?	70·1	72·1	?	?	?	?	?	?	78·9	6th	?	?	?
	Noakholly	42·73	29·840	?	29·830	29·934	9th	29·730	14th	·204	81·7	88·9	?	73·9	?	81·4	?	15·0	92·3	6th	61·5	2nd	30·8
	Comilla	34·75	29·842	?	29·825	29·919	19th	29·744	14th	·175	80·2	91·5	?	72·4	?	82·0	?	19·1	97·3	6th	61·9	2nd	35·4
	Serajgunj	46·37	29·787	?	29·783	29·856	1st	29·661	14th	·195	78·4	96·2†	?	69·4†	?	82·8†	?	26·8	104·0	16th	57·9	1st	46·1
	Dacca	21·7	29·829	+·013	29·800	29·906	19th	29·721	13th	·185	79·6	94·2	+1·0	73·5	−0·9	83·9	+0·1	20·7	97·6	9th & 20th.	65·7	2nd	31·9
	Burrisal	12	29·858	+·033	29·815	29·932	19th	29·763	13th	·169	81·9	92·3	+2·6	74·3	+0·6	83·6	+1·6	17·4	97·8	6th	65·5	2nd	32·3
	Mymensingh	55·18	29·797	+·026	29·807	29·861	1st	29·675	14th	·186	76·2	92·1	+1·2	70·5	−0·6	81·3	+0·3	21·6	99·7	15th	58·5	1st	41·2
Deltaic Bengal	Furreedpore	39	29·814	?	29·801	29·901	1st	29·706	14th	·195	79·1	94·6	?	72·4	?	83·5	?	22·2	99·5	11th & 15th.	62·0	1st	37·5
	Jessore	33·29	29·807	+·012	29·787	29·897	19th	29·710	14th	·187	81·3	97·3	−0·1	74·4	−0·6	85·9	−0·4	22·9	103·2	15th	64·5	23rd	38·7
	Calcutta	21·38	29·818	+·020	29·785	29·910	9th	29·721	13th	·189	82·3	96·7	+1·1	76·3	+0·7	86·5	+0·9	20·4	102·6	15th	68·2	1st	34·4
	Saugor Island	25·3	29·820	+·013	29·789	29·909	8th	29·728	14th	·181	83·9	90·4	−0·4	80·7	+1·0	85·5	+0·3	9·7	93·7	15th	76·5	29th	17·2
	Kishnaghur	46·64	29·779	?	29·775	29·876	1st	29·672	13th	·204	82·3	100·1	?	73·6	?	86·9	?	26·5	105·8	14th	62·9	1st	42·9
	Midnapore	148·88	29·685	?	29·781	29·786	9th	29·591	13th	·195	83·0	102·0	?	75·7	?	88·9	?	26·3	108·4	14th	71·2	4 dates	37·2
Central Bengal	Bankoora	300	29·514	?	29·762	29·604	1st	29·420	13th	·184	83·6	103·0	?	75·5	?	89·3	?	27·5	109·1	14th	67·6	2nd	41·5
	Raneegunge	333	29·502‡	?	29·780‡	29·595	1st	29·396	13th	·199	81·6‡	101·2§	?	73·3§	?	87·3§	?	27·9	107·1	17th	65·0	3rd	42·1
	Burdwan	99·09	29·736	+·024	29·782	29·832	1st	29·631	13th	·201	82·0	100·6	0	74·4	−1·0	87·5	−0·5	26·2	106·5	14th	65·6	2nd	40·9

* Mean of 22 days. † Mean of 29 days. ‡ Mean of 27 days. § Mean of 26 days, ‖ Mean of 30 days.

I.

in India, Burma, &c., in April 1891.

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.	Normal rainfall for period, 1st March to 30th April 1891.	Variation from normal of period.	Station.	Meteorological Province or District.
...	...	...	...	...	...	...	...	.	...	...	.	...	...	...	...	...	...	0·44	2·46	−2·02	...	...	...	**Burma Coast and Bay Islands.**	
3	2	2	1	3	...	4	6	9	4	5	−20	81	·935	2·4	1	...	...	0·35	2·27	−1·92	0·35	2·76	−2·41	Port Blair .	Bay Islands.
...	2	2	2	2	1	1	...	20	3	2	+50	77	·867	2·6	3	...	...	1·59	5·64	−4·05	2·76	8·14	−5·38	Mergui .	Tenasserim.
27	...	1	...	...	...	...	...	2	2	?	?	81	·858	0·9	0	...	...	0·06	3·93	−3·87	0·24	4·69	−4·45	Tavoy.	
...	1	2	5	6	7	5	2	2	4	3	+33	78	·860	2·0	2	...	...	0·81	2·64	−1·83	0·81	3·05	−2·24	Moulmein.	
...	1	...	...	18	10	1	...	...	5	4	+25	70	·827	3·5	1	...	...	0·21	1·89	−1·68	0·46	1·93	−1·47	Toungoo.	
...	1	...	...	...	2	11	14	2	6	6	0	82	·849	2·4	0	...	...	0	1·75	−1·75	0	1·82	−1·82	Rangoon .	Lower Burma.
4	...	...	...	...	...	2	6	18	7	5	+40	77	·842	3·9	0	...	...	0	1·40	−1·40	0	1·43	−1·43	Bassein.	
...	5	...	...	...	...	...	10	15	6	7	−14	72	·821	2·8	0	...	...	0	1·34	−1·34	0	1·34	−1·34	Diamond Island.	
...	7	9	2	2	6	2	1	1	3	4	−25	76	·849	5·0	2	...	...	0·97	1·25	−0·28	2·01	1·62	+0·39	Akyab .	Arakan.
...	...	...	.	...	...	...	..	...	...	...	...	...	...	...	..	...	...	0·88	0·98	−0·10	...	...	...	**Burma, Inland.**	
...	1	1	...	1	18	5	3	1	8	7	+14	61	·715	0·8	1	...	...	0·45	0·69	−0·24	1·10	0·69	+0·41	Thayetmyo	Central Burma.
1	10	3	8	3	3	...	2	...	?	?	?	59	·675	6·2	1	...	...	0·41	0·76	−0·35	0·43	0·94	−0·51	Mandalay .	Upper Burma.
...	5	7	1	1	...	2	...	6	5*	?	?	92*	·833*	0·7*	6	...	...	1·26	0·96	+0·30	1·26	1·46	−0·20	Kindat.	
...	...	4	...	2	...	2	2	20	?	?	?	74	·606	3·6	4	...	...	1·40	1·51	−0·11	1·59	2·32	−0·73	Bhamo.	
...	...	...	...	...	...	..	...	...		...	...	...	...	...	...	...	...	7·97	9·58	−1·61	...	...	...	**Assam.**	
21	...	3	5	1	...	...	...	...	1	3	−67	80	·696	6·2	12	...	...	8·42	15·07	−6·65	12·53	24·36	−11·83	Silchar .	Assam (Surma).
2	...	23	2	2	...	...	...	1	2	3	−33	91	·657	7·5	17	...	...	10·01	8·64	+1·37	13·77	13·37	+0·40	Sibsagar .	Brahmaputra.
2	1	8	13	...	...	5	...	1	9	8	+13	74	·632	4·5	6	...	...	5·47	5·02	+0·45	7·72	7·74	−0·02	Dhubri.	
...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2·29	2·58	−0·29	...	...	...	**Bengal and Orissa.**	
1	...	3	4	14	7	1	...	...	6	7	−14	76	·781	5·2	8	...	...	7·73	3·56	+4·17	9·46	6·43	+3·03	Chittagong	East Bengal.
			Not	recor	ded.							91	·677	?	9	...	...	8·23	?	?	9·38	?	?	Lungleh.	
1	1	1	3	9	9	6	...	...	7	?	?	80	?	1·8	7	...	...	4·13	4·31	−0·18	7·14	7·16	−0·02	Noakholly.	
...	...	...	2	8	20	..	...	...	7	?	?	78	?	2·6	11	...	...	13·97	6·53	+7·44	16·48	9·60	+6·88	Comilla.	
...	...	...	8	4	9	5	4	...	3	?	?	77	?	4·0	4	...	...	3·93	?	?	6·08	?	?	Serajgunj.	
...	...	...	3	7	15	4	1	...	9	7	+29	82	·834	6·2	8	...	...	5·45	5·10	+0·35	8·13	8·84	−0·71	Dacca.	
6	...	...	...	4	14	5	...	1	6	?	?	82	·871	4·9	4	...	...	1·89	3·47	−1·58	4·47	5·98	−1·51	Burrisal.	
...	...	3	12	10	4	1	...	...	6	?	?	83	·756	5·4	6	...	...	3·97	4·05	−0·08	5·99	6·24	−0·25	Mymensingh.	
4	...	...	3	1	16	6	...	...	6	?	?	85	?	3·4	6	...	...	6·71	4·07	+2·64	8·65	6·85	+1·80	Furreedpore	Deltaic Bengal.
8	...	...	...	5	7	8	2	...	4	4	0	85	·914	4·4	3	...	...	3·85	3·67	+0·18	7·27	6·54	+0·73	Jessore.	
2	...	...	...	2	8	15	2	1	5	7	−29	80	·880	2·7	1	...	...	0·54	1·71	−1·17	4·48	3·11	+1·37	Calcutta.	
...	...	...	...	...	12	16		1	19	17	+12	82	·949	5·0	0	...	...	0	1·25	−1·25	2·89	2·80	+0·09	Saugor Island.	
1	...	...	1	5	8	7	6	2	6	?	?	69	?	3·2	2	...	...	1·18	2·47	−1·29	4·71	3·72	+0·99	Kishnaghur.	
1	3	...	...	2	21	1	...	2	7	?	?	66	?	1·6	0	...	...	0	1·64	−1·64	7·93	3·05	+4·88	Midnapore.	
2	1	...	...	2	6	3	13	3	4	?	?	52	?	2·0	0	...	...	0	1·61	−1·61	3·36	3·02	+0·34	Bankoora .	Central Bengal.
1	1	1	1	3	1	5	9	5	3‖	?	?	53‡	?	2·3‡	1	...	...	0·22	?	?	6·95	?	?	Raneegunge.	
2	1	...	1	2	9	9	4	2	5	5	0	62	·685	3·5	0	...	...	0	1·99	−1·99	6·91	3·36	+3·55	Burdwan.	

Table

Abstract of observations taken at 8A.M. at 158 stations

Meteorological Province or District.	Station.	Height of station 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.
Central Bengal	Nya Doomka	490	29·317	?	29·760	29·407	1st	29·209	13th	·198	84·2	100·6	?	73·4	?	87·0	?	27·2	106·7	17th	63·9	2nd	42·8
	Berhampore	66·45	29·752	+·011	29·768	29·852	1st	29·644	13th	·208	79·0	99·8	−0·5	72·8	−1·5	86·3	−1·0	27·0	106·2	14th	63·2	1st	43·0
	Rampore Bauleah.	70	29·752	?	29·772	29·841	1st	29·637	13th	·204	79·7	96·1	?	72·3	?	81·2	?	23·8	102·3	14th	59·9	1st	42·9
	Maldah	80	29·726	?	29·758	29·319	1st	29·593	14th	·226	80·1	97·7	?	68·5	?	83·1	?	29·2	104·8	16th	57·7	1st	47·1
	Bogra	61·48	29·755	+·028	29·769	29·824	1st	29·629	14th	·195	79·7	97·5	+1·2	70·6	−1·4	84·0	−0·1	26·9	105·3	16th & 17th	58·2	1st	47·1
North Bengal	Dinagepore	117·59	29·693	−·017	29·765	29·772	1st	29·556	14th	·216	77·0	96·4	+1·3	68·3	−1·6	82·4	−0·2	28·1	104·6	16th & 17th	57·4	1st	47·2
	Rungpore	123	29·717	?	29·785	29·783	1st	29·568	14th	·215	76·8	94·1	?	66·8	?	80·5	?	27·3	102·8	16th	55·0	1st	47·8
	Jalpaiguri	283·7	29·539	+·004	29·779	29·611	26th	29·390	14th	·221	75·8	90·3	+1·6	66·4	−0·7	78·4	+0·5	23·9	97·0	19th	57·4	2nd	39·6
Orissa	Balasore	56·15	29·781	+·014	29·784	29·889	9th	29·685	13th	·204	82·2	97·1	+0·9	75·7	+0·2	86·4	+0·6	21·4	104·5	14th	69·7	6th	34·8
	False Point	20·60	29·831	+·009	29·794	29·945	9th	29·746	24th	·199	83·2	89·9	−1·1	77·5	−0·1	83·7	−0·6	12·4	97·5	28th	71·1	1st	26·4
	Cuttack	80	29·776	+·031	29·799	29·881	9th	29·687	14th	·194	83·2	103·2	+0·9	76·8	−1·1	90·0	−0·1	26·4	107·9	13th	72·3	6th	35·6
	Shortt's Island	?	29·816	?	?	29·927	9th	29·730	24th	·197	83·1	88·6	?	78·9	?	83·8	?	9·7	96·7	28th	75·4	2nd	21·3
	Pooree	11·99	29·852	?	29·804	29·964	9th	29·755	14th	·209	81·8	87·5	?	78·8	?	83·2	?	8·7	97·7	27th	73·1	19th	24·6
Gangetic Plain and Chutia Nagpur.		...	...	+·021	...	...	...	...	...	...	...	99·5	−1·1	71·4	−1·1	85·5	−1·1	28·2	...	...	...	...	42·6
Chutia Nagpur	Hazaribagh	2,007·12	27·835	+·023	29·760	27·934	8th	27·755	24th	·179	83·6	97·9	−0·3	72·3	+0·2	85·1	−0·1	25·6	103·5	16th	65·5	1st & 2nd.	38·0
	Ranchee	2,128·14	27·721	?	29·762	27·805	9th	27·640	24th	·165	82·7	96·1	?	70·6	?	83·4	?	25·5	101·5	16th & 24th	61·9	27th	39·6
	Chybassa	760	29·071	?	29·772	29·170	9th	28·986	13th	·184	84·4	103·3	?	75·0	?	89·1	?	28·3	108·9	24th	67·8	5th	41·1
Behar, South	Gya	374·5	29·432	+·016	29·759	29·540	1st	29·350	14th	·190	83·3	102·0	−1·6	74·9	+0·9	88·5	−0·4	27·1	106·6	16th	65·5	1st	41·1
	Dehree	351·14	29·454	?	29·756	29·552	1st	29·365	13th	·187	85·6	102·0	?	75·6	?	88·8	?	26·4	107·4	16th	66·5	1st	40·9
	Patna	182·84	29·622	+·015	29·757	29·712	8th	29·518	14th	·194	82·9	100·2	−0·8	71·9	−1·3	86·1	−1·1	28·3	107·0	16th	61·3	1st	45·7
	Arrah	190·02	29·610	?	29·752	29·704	1st	29·508	13th	·196	82·1	100·3*	?	71·5	?	85·9*	?	28·8	106·7	16th	62·6	2nd	44·1
	Buxar	239·22	29·561	?	29·755	29·656	1st & 8th	29·465	13th	·191	81·8	98·5	?	71·9	?	85·2	?	26·6	103·9	16th	63·4	2nd	40·5
Behar, North	Purneah	125	29·694	+·023	29·774	29·771	1st	29·573	14th	·198	77·9	97·2	−0·2	69·3	−0·1	83·3	−0·2	27·9	109·9	15th	56·3	1st & 2nd.	53·6
	Bhagalpur	159·78	29·637	?	29·750	29·726	1st	29·539	13th	·187	81·8	98·9	?	71·4	?	85·2	?	27·5	105·9	17th	59·3	1st	46·6
	Durbhunga	166·32	29·646	+·016	29·767	29·720	1st	29·519	14th	·201	79·3	97·0	+0·7	69·4	−2·4	83·2	−0·9	27·6	103·6	16th & 17th	59·2	1st	41·4
	Mozufferpore	178·42	29·605	?	29·738	29·699	1st	29·480	14th	·219	?	96·8	?	70·7	?	83·8	?	26·1	103·4	16th	58·3	1st	45·1
	Motiharee	223·61	29·563	?	29·746	29·641	1st	29·426	14th	·215	79·2	97·5	?	66·0	?	81·8	?	31·5	105·2	16th	54·9	1st	50·3
	Chupra	181·3	29·609		29·744	29·707	8th	29·503	13th	·204	81·2	99·3	?	70·6	?	85·0	?	28·7	103·3	14th, 17th & 22nd.	62·9	2nd	40·4
N.-W. Provinces (Eastern Districts).	Benares	266·97	29·517	+·029	29·773	29·633	8th	29·451	13th	·182	80·8	101·3	−2·3	69·5	−2·7	85·4	−2·5	31·8	107·3	23rd	60·8	1st	46·5
	Allahabad	309·28	29·510	+·028	29·776	29·606	8th	29·421	27th	·185	83·9	102·2	−1·8	70·9	−1·1	86·6	−1·5	31·3	108·9	23rd	61·7	2nd	47·2
N.-W. Provinces (Eastern Sub-montane).	Gorakhpur	255·93	29·528	+·010	29·746	29·619	9th	29·417	14th	·202	78·9	98·9	−2·1	71·3	−1·0	85·5	−1·6	27·6	105·8	16th	61·3	1st	44·5
Oudh, South	Lucknow	369·4	29·441	+·025	29·772	29·531	1st	29·359	14th	·172	81·6	101·1	−1·1	69·0	−2·0	85·1	−1·6	32·1	107·3	23rd	60·0	3rd	47·3
N.-W. Provinces, (Central).	Cawnpore	415·57	29·389	?	29·763	29·479	1st	29·301	27th	·178	82·5	100·5	?	74·3	?	87·4	?	26·2	106·6	22nd & 24th	64·4	1st	42·2
Upper—Sub-Himalayas		...	...	+·041	...	...	...	...	...	...	...	93·2	−2·9	64·0	−2·6	78·6	−2·8	29·3	...	...	...	...	46·5
N.-W. Provinces, (Submontane).	Bareilly	568·47	29·224	+·030	29·765	29·322	8th	29·152	14th	·170	77·2	98·1	−1·3	67·9	−0·6	82·9	−1·0	30·2	105·4	23rd	58·5	1st	46·9
	Dehra Dun	2,232·4	27·599	?	29·809	27·706	8th	27·533	22nd	·173	70·1	89·2	?	62·0	?	75·6	?	27·2	95·5	22nd & 23rd.	57·0	2nd	38·5
	Roorkee	886·63	28·913	+·033	29·782	29·017	8th	28·826	22nd	·191	74·9	96·4	−1·5	63·6	−3·0	80·0	−2·3	32·8	104·7	23rd	55·4	1st	49·3
	Meerut	737·48	29·070	+·041	29·780	29·166	8th	28·975	22nd	·191	78·6	97·2	−1·1	65·7	−2·2	81·5	−1·7	31·5	105·2	23rd	58·0	1st	47·2
Punjab (Central).	Delhi	717·81	29·109	+·051	29·798	29·202	9th	29·007	22nd	·195	79·3	97·3	−3·1	71·8	−1·4	84·5	−2·3	25·5	106·0	22nd	63·1	8th	42·9
	Lahore	702·22	29·119	+·052	29·806	29·247	5th	29·005	21st	·242	74·4	91·7	−4·6	61·5	−4·8	76·6	−4·7	30·2	103·3	22nd	54·0	6th	49·3

* Mean of 29 days. † Mean of 28 days.

I—*continued.*

in India, Burma, &c., in April 1891—continued.

Wind Direction. Number of Winds from									Wind Velocity.			Hygrometry, 8 A.M.		Mean cloud amount.	Rainfall.								Station.	Meteorological Province or 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 1891.	Normal rainfall for period, 1st March to 30th April.	Variation from normal of period.	
10	...	...	2	5	3	1	1	8	4	?	?	41	?	0·1	1	...	...	0·27	1·05	—0·78	6·18	1·77	+4·41	Nya Doomka	Central Bengal.
...	...	...	4	2	11	8	3	2	5	5	0	74	·742	3·2	1	...	...	0·22	1·41	—1·19	4·18	2·61	+1·57	Berhampore.	
2	...	...	1	6	6	12	3	...	3	?	?	71	?	1·9	1	...	...	0·30	1·73	—1·43	6·40	2·96	+3·44	Rampore-Bauleah.	
...	...	1	10	6	1	4	3	5	4	?	?	61	?	1·7	2	...	...	0·44	1·35	—0·91	4·24	2·20	+2·04	Maldah.	
3	...	4	8	4	2	8	1	...	5	?	?	68	·699	3·0	1	...	...	0·36	2·29	—1·93	3·84	3·13	+0·71	Bogra.	
...	...	3	9	1	1	9	6	1	5	?	?	61	·559	2·6	1	...	...	0·37	1·89	—1·52	2·80	2·79	+0·01	Dinagepore	North Bengal.
3	...	...	16	3	4	1	3	...	4	?	?	66	?	0·9	3	...	...	1·74	3·08	—1·34	3·46	4·23	—0·77	Rungpore.	
				Not recorded.					6	?	?	73	·652	0·7	5	...	...	3·13	4·20	—1·07	5·60	6·03	—0·43	Jalpaiguri.	
1	2	1	1	...	8	13	2	2	7	?	?	79	·876	0·2	0	...	...	0·02	2·54	—2·52	5·69	3·92	+1·77	Balasore	Orissa.
...	...	...	...	...	10	15	4	1	14	14	0	82	·931	3·9	0	...	...	0	0·64	—0·64	1·96	2·02	—0·06	False Point	
9	...	...	...	...	4	12	5	...	4	5	—20	71	·812	3·0	0	...	...	0	0·65	—0·65	3·37	1·79	+1·58	Cuttack.	
...	...	...	...	...	...	23	6	1	10	?	?	81	·918	1·3	0	...	...	0	?	?	1·81	?	?	Shortt's Island.	
1	1	...	...	...	1	25	1	1	15	?	?	85	?	2·9	0	...	...	0	0·88	—0·88	2·94	1·45	+1·49	Pooree.	
...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·04	0·43	—0·39	...	...	...	**Gangetic Plain and Chutia Nagpur.**	
...	1	...	...	...	7	7	9	6	10	8	+25	26	·312	1·8	0	...	...	0·03	0·31	—0·28	2·66	1·13	+1·53	Hazaribagh.	Chutia Nagpur.
12	2	...	...	...	3	4	5	4	5	?	?	39	?	1·6	1	...	...	0·31	0·62	—0·31	7·83	1·92	+5·91	Ranchee.	
4	...	...	...	1	2	8	12	3	2	?	?	46	?	1·4	0	...	...	0·07	0·68	—0·61	5·26	1·89	+3·37	Chybassa.	
...	...	...	3	...	15	4	7	1	5	4	+25	56	·654	2·5	0	...	...	0	0·15	—0·15	2·45	0·79	+1·66	Gya	Behar, South.
...	1	...	1	2	4	15	5	2	6	?	?	37	?	1·2	0	...	...	0·03	?	?	2·29	?	?	Dehree.	
2	...	2	6	...	...	5	15	...	5	4	+25	39	·432	1·4	0	...	...	0	0·18	—0·18	2·69	0·59	+2·10	Patna.	
...	...	4	3	2	...	9	11	1	4	?	?	46	?	1·3	0	...	...	0	0·51	—0·51	2·74	1·00	+1·74	Arrah.	
1	...	3	2	1	...	3	18	2	8	?	?	39	?	2·1	0	...	...	0	0·16	—0·16	1·32	0·43	+0·89	Buxar.	
4	...	4	8	2	1	1	5	5	4	4	0	57	·540	1·4	0	...	...	0·08	1·14	—1·06	2·20	1·63	+0·57	Purneah	Behar, North.
11	1	3	4	1	...	7	3	...	2	?	?	49*	?	1·8	0	...	...	0	0·84	—0·84	3·07	1·23	+1·84	Bhagalpur.	
2	...	1	8	4	...	4	7	4	6	6	0	56	·561	0·6	0	...	...	0	0·58	—0·58	2·12	0·92	+1·20	Durbhunga.	
1	...	...	10	1	1	4	11	2	7	?	?	?	?	0·6	0	...	...	0	0·52	—0·52	2·11	0·97	+1·14	Mozufferpore	
...	2	...	8	4	...	4	8	4	10	?	?	61	?	1·0	0	...	...	0	0·64	—0·64	3·09	1·15	+1·94	Motiharee.	
2	...	...	7	1	...	4	16	...	8	?	?	46	?	1·2	0	...	...	0	0·38	—0·38	3·19	0·76	+2·43	Chupra.	
7	1	1	...	...	3	15	3	...	2	5	—60	45	·481	2·3	0	...	...	0·07	0·13	—0·06	1·23	0·30	+0·93	Benares	N.-W. Provinces (Eastern Districts).
3	2	1	2	...	2	7	9	4	5	4	+25	36	·412	2·1	0	...	...	0·02	0·17	—0·15	1·15	0·37	+0·78	Allahabad.	
...	2	2	3	1	...	2	19	1	4	4	0	47	·466	1·1	0	...	...	0	0·48	—0·48	2·89	0·74	+2·15	Gorakhpur	N.-W. Provinces (Eastern Sub-montane).
...	4	2	2	...	...	8	6	8	6	4	+50	39	·421	2·2	0	...	..	0·02	0·08	—0·06	2·45	0·31	+2·14	Lucknow	Oudh, South.
2	2	2	1	2	1	8	8	4	5	?	?	47	·527	1·9	1	...	...	0·15	0·15	0	1·70	0·39	+1·31	Cawnpore	N.-W. Provinces (Central).
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·39	0·66	—0·27	...	...	...	**Upper Sub-Himalayas.**	
12	3	...	...	2	...	1	...	12	3	5	—40	49	·466	1·2	0	...	...	0·08	0·16	—0·08	3·32	1·15	+2·17	Bareilly	N.-W. Provinces (Submontane).
28	...	...	1	...	...	...	...	1	2	3	33	50	·368	4·2	1	...	...	0·25	0·65	—0·40	1·94	1·95	—0·01	Dehra Dun.	
21	1	...	1	1	2	...	2	2	3	3	0	44	·377	1·3	0	...	...	0·16	0·46	—0·30	1·07	1·29	—0·22	Roorkee.	
4	...	...	2	...	1	...	14	9	3	2	+50	37	·351	2·6	0	...	...	0·10	0·31	—0·21	1·34	1·33	+0·01	Meerut.	
6	1	...	1	...	1	4	15	2	4	4	0	44	·440	3·7	2	...	...	0·30	0·21	+0·09	1·28	0·77	+0·51	Delhi	Punjab (Central).
12	6	2	1	1	...	...	1	7	2	3	—33	52	·437	3·1	1	...	...	0·51	0·38	+0·13	3·38	1·07	+2·31	Lahore.	

Table

Abstract of observations taken at 8 A.M. at 158 stations

Meteorological Province or District.	Station.	Height of Station in feet.	Pressure, 8 A.M., in inches. 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.	Temperature of Air. 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.
Punjab (Submontane).	Ludhiana	811·86	28·983	+·025	29·776	29·083	5th	28·869	22nd	·214	76·6	94·4	−3·0	64·3	−2·1	79·4	−2·6	30·1	104·8	22nd	57·2	6th	47·6
Punjab (North).	Sialkot	829·47	28·982	+·048	29·800	29·087	5th	28·882	27th	·205	74·3	91·1	−3·7	62·4	−3·5	76·8	−3·6	28·7	103·2	22nd	54·2	6th	49·0
	Rawalpindi	1,648·9	28·197	+·051	29·834	28·308	5th	28·095	21st	·213	66·2	83·5	−4·5	56·4	−3·0	69·9	−3·8	27·1	93·0	21st	45·0	6th	48·0
Indus Valley and North-West Rajputana.		...	...	+·038	...	...	...	...	...	...	...	95·9	−0·8	67·9	−0·4	81·9	−0·6	28·0	...	...	...	...	46·3
Punjab, West	Peshawar	1,110·4	28·794	+·068	29·867	28·909	5th	28·667	21st	·242	69·5	82·7	−3·5	57·9	−2·3	70·3	−2·9	24·8	91·0	21st	50·0	6th	41·0
	Khushab	611·51	29·213	?	29·806	29·317	5th	29·074	22nd	·243	76·1	90·7	?	65·8	?	78·3	?	24·9	103·0	22nd	55·6	15th	47·4
	Montgomery	558·46	29·274	?	29·808	29·394	5th	29·145	21st	·249	78·8	95·7	?	65·2	?	80·5	?	30·5	107·9	22nd	57·8	16th	50·1
	D. I. Khan	572·56	29·268	+·053	29·827	29·388	5th	29·119	21st	·269	72·9	92·5	−1·3	62·9	−2·3	77·7	−1·8	29·6	100·5	20th, 21st & 22nd	52·7	15th	47·8
	Mooltan	420·19	29·434	+·057	29·829	29·575	1st	29·291	21st	·284	75·5	96·4	−0·7	66·5	−0·5	81·5	−0·6	29·9	106·7	22nd	57·7	15th	49·0
	Sirsa	661·61	29·164	+·048	29·803	29·260	9th	29·033	22nd	·227	76·7	98·5	−1·7	65·9	−2·0	82·2	−1·9	32·6	109·4	22nd	60·3	1st	49·1
Sind and Cutch.	Jacobabad	185·9	29·659	+·054	29·809	29·759	5th	29·504	21st	·255	80·8	101·5	−0·1	70·7	+2·4	86·1	+1·2	30·8	111·3	22nd	57·4	15th	53·9
	Hyderabad	117·43	29·725	+·019	29·798	29·814	5th	29·594	27th	·220	79·6	101·3	−0·2	72·5	+0·9	86·9	+0·4	28·8	109·2	21st	65·1	2nd	44·1
	Kurrachee	49	29·804	−·012	29·806	29·887	5th	29·682	25th	·205	77·8	91·0	+1·9	73·3	+1·1	82·1	+1·5	17·7	97·9	20th	65·9	16th & 17th.	32·0
	Bhuj	394·9	29·474	?	29·823	29·533	9th	29·382	27th	·151	80·8	99·9	?	71·5	?	85·7	?	28·4	105·0	25th	65·1	1st & 2nd	39·9
Rajputana, West	Bickaneer	743·5	29·136	?	29·849	29·222	6th	29·066	29th	·156	78·9	98·1	?	73·7	?	85·9	?	24·4	106·3	22nd	67·2	2nd	39·1
	Pachpadra	380	29·440	?	29·776	29·620	1st	29·325	25th	·295	82·0	102·9	?	68·9	?	85·9		34·0	107·5	21st & 22nd	45·9	8th	61·6
East Rajputana, Central India and Guzerat.		...	...	+·032	...	...	...	...	...	..	...	99·6	−0·3	71·0	+0·3	85·3	0	28·6	...	...	...	...	44·4
Rajputana, East	Jeypore	1,430·6	28·426	+·034	29·819	28·521	5th	28·326	27th	·195	82·7	99·6	−0·5	69·4	+0·4	84·5	−0·1	30·2	106·1	22nd	63·1	1st	43·0
	Sambhar	1,253·52	28·587	+·035	29·810	28·681	5th	28·490	27th	·191	80·0	98·4	−0·5	68·3	−1·9	83·4	−1·2	30·1	105·4	22nd	56·9	1st	48·5
	Ajmere	1,611	28·265	+·040	29·840	28·355	5th	28·172	27th	·183	81·2	98·3	+0·2	70·1	+0·2	84·2	+0·2	28·2	104·5	22nd	57·7	1st	46·8
	Deesa	465·5	29·408	+·018	29·832	29·466	9th	29·340	27th	·126	82·8	103·9	+1·6	71·7	+1·2	87·8	+1·4	32·2	109·4	21st	60·8	1st	48·6
Kattiawar	Rajkot	428·83	29·471	+·020	29·858	29·529	11th	29·390	26th	·139	77·8	101·7	−0·2	69·4	+0·6	85·6	+0·2	32·3	105·9	23rd	61·9	1st	44·0
	Verawal	?	29·900	?	29·862	29·955	11th	29·845	27th	·110	78·3	85·7	?	70·8	?	78·2	?	14·9	93·8	1st	60·8	1st	33·0
	Bhavnagar	?	29·889	?	29·875	29·945	9th	29·833	25th	·112	80·6	99·6	?	72·8	?	86·2	?	26·8	105·4	20th	66·0	1st	39·4
Central India	Nowgong	757·04	29·087	+·037	29·801	29·157	1st	28·977	27th	·180	82·7	102·2	−1·6	70·8	−0·3	86·4	−1·0	31·4	108·6	23rd	58·3	1st	50·3
	Sutna	1,040·1	28·788	+·029	29·788	28·891	8th	28·689	27th	·202	84·4	100·7	−0·7	70·4	−0·5	85·6	−0·6	30·3	107·7	23rd	60·7	1st	47·0
	Indore	1,823·2	28·065	+·034	29·828	28·140	9th	27·988	27th	·152	83·9	100·8	+0·8	70·2	+1·5	85·5	+1·2	30·6	103·9	22nd & 24th	59·6	1st	44·3
	Neemuch	1,630	28·241	+·029	29·824	28·316	5th	28·146	27th	·170	83·5	99·3	−0·9	70·7	+0·5	85·0	−0·2	28·6	103·9	22nd	59·8	1st	44·1
Guzerat	Surat	36	29·893	+·034	29·873	29·950	8th	29·849	26th	·101	83·2	100·1	+0·1	71·5	0	85·9	+0·1	28·6	107·1	19th	61·0	1st	46·1
N.-W. P. (West)	Agra	555·44	29·292	+·016	29·815	29·395	5th	29·184	27th	·211	80·4	101·1	−1·4	71·7	+0·3	86·4	−0·6	29·4	108·5	23rd	62·6	1st	45·9
	Jhansi	840·13	28·992	+·033	29·788	29·089	5th	28·889	27th	·200	84·6	102·8	−0·7	76·5	+1·0	89·7	+0·2	26·3	109·5	23rd	68·4	1st	41·1
Deccan		..	...	+·037	...	...	...	...	...	...	...	102·4	−0·4	72·9	+0·3	87·7	−·1	29·5	...	...	...	...	41·4
Bombay, Deccan	Belgaum	2,524	27·405	+·028	29·855	27·468	10th	27·372	4th	·096	77·2	95·7	−1·0	67·6	+0·4	81·7	−0·3	28·1	98·3	30th	64·4	28th	33·9
	Sholapur	1,589·7	28·330	+·060	29·850	28·391	9th	28·295	24th	·096	86·4	105·3	+0·2	75·8	+1·0	90·6	+0·6	29·5	108·2	14th	71·5	18th	36·7
	Poona	1,840·37	28·091	+·043	29·875	28·148	11th	28·052	25th	·096	81·2	102·6	+1·9	68·8	−0·9	85·4	+0·5	33·8	105·3	13th & 14th	63·4	4th	41·9
Khandeish	Malegaon	1,430·12	28·478	+·037	29·853	28·532	9th	28·438	27th	·094	85·8	103·2	+0·5	70·8	+0·3	87·0	+0·4	32·4	105·8	13th & 22nd	62·4	1st	43·4
	Ahmednagar	2,151·62	27·775	?	29·851	27·831	10th	27·735	24th	·096	83·0	99·7	?	69·5	?	84·7	?	30·2	102·7	4 dates	61·0	1st	41·7
Berar	Akola	930	28·495	+·041	29·824	29·017	8th	28·880	24th	·137	84·4	105·4	−0·2	74·3	+0·5	89·9	+0·2	31·1	108·6	15th, 20th & 25th	65·8	4th	42·8
	Amraoti	1,215·5	28·658	+·045	29·823	28·742	9th	28·598	14th	·144	84·6	105·5	−0·2	76·1	+1·0	90·8	+0·4	29·4	111·3	20th	67·8	1st	43·5

I —*continued.*

in India, Burma, &c., in April 1891 —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 1891.	Normal rainfall for period 1st March to 30th April.	Variation from normal of period.	Station.	Meteorological Province or District.
9	4	3	3	...	1	...	7	3	3	2	+50	52	·470	4·6	1	...	...	0·33	0·84	−0·51	2·69	1·88	+0·81	Ludhiana.	Punjab (Sub-montane).
10	7	...	2	...	...	...	7	4	2	2	0	57	·474	2·6	1	...	...	0·22	0·94	−0·72	2·60	2·18	+0·42	Sialkot .	Punjab, North.
3	2	1	...	2	..	2	2	18	2	3	−33	66	·425	3·6	2	...	...	1·54	2·02	−0·48	4·14	3·97	+0·17	Rawalpindi.	
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·55	0·39	+0·16	...	...	...	**Indus Valley and N.-W. Rajputana.**	
17	1	1	1	1	3	3	2	1	3	4	−25	67	·484	3·9	2	...	...	2·59	2·01	+0·58	4·22	3·85	+0·37	Peshawar .	Punjab, West.
8	2	5	5	1	2	2	3	2	4	?	?	42	·360	2·9	3	...	...	1·15	?	?	2·86	?	?	Khushab.	
2	4	8	6	3	3	1	..	3	6	?	?	41	·386	2·8	2	...	...	0·57	0·24	+0·33	1·89	0·72	+1·17	Montgomery	
13	2	4	2	1	...	...	3	5	2	2	0	60	·481	3·7	2	...	...	1·71	0·79	+0·92	2·94	1·37	+1·57	D. I. Khan.	
11	...	6	...	1	...	6	1	5	2	2	0	57	·501	2·4	1	...	...	0·18	0·04	+0·14	0·81	0·53	+0·28	Mooltan.	
4	5	3	1	2	1	4	5	5	6	4	+50	54	·492	4·5	0	...	...	0	0·39	−0·39	0·92	0·75	+0·17	Sirsa.	
4	2	3	8	5	4	1	1	2	4	4	0	53	·550	3·1	1	...	...	0·27	0·07	+0·20	0·45	0·18	+0·27	Jacobabad	Sind and Cutch.
...	...	1	...	2	...	25	...	2	8	10	−20	49	·495	3·9	0	...	...	0	0	0	0·25	0·17	+0·08	Hyderabad.	
1	1	4	1	...	...	8	10	5	12	14	−14	86	·839	1·3	0	...	...	0	0·44	−0·44	1·18	0·62	+0·56	Kurrachee.	
...	2	1	...	...	...	2	17	8	11	11	0	60	·635	1·0	0	...	...	0	0·15	−0·15	0	0·25	−0·25	Bhuj.	
...	5	5	3	3	4	2	2	6	6	5	+20	51	·510	1·4	1	...	...	0·16	0·18	−0·02	0·84	0·29	+0·55	Bickaneer .	Rajputana, West.
14	1	2	3	1	3	4	1	1	7	5	+40	45	·504	1·0	0	...	...	0	0	0	0·28	0·08	+0·20	Pachpadra.	
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·06	0·13	−0·07	...	...	...	**East Rajputana, Central India and Guzerat.**	
10	6	5	...	...	...	1	2	6	4	6	−33	34	·379	3·5	0	...	...	0·04	0·10	−0·06	1·48	0·17	+1·31	Jeypore .	Rajputana, East.
9	6	5	1	1	2	2	1	3	7	7	0	32	·331	2·1	0	...	...	0·04	0·07	−0·03	0·70	0·43	+0·27	Sambhar.	
11	...	8	...	...	3	3	4	1	5	5	0	39	·420	1·8	1	...	...	0·25	0·10	+0·15	1·22	0·11	+1·11	Ajmere.	
...	2	3	2	2	3	10	8	...	9	9	0	45	·503	3·2	0	...	...	0	0	0	0·09	0·06	+0·03	Deesa.	
...	1	...	...	...	...	3	14	12	10	10	0	80	·756	1·0	0	...	...	0·05	0	+0·05	0·16	0	+0·16	Rajkot .	Kattiawar.
7	8	...	...	...	...	1	4	10	6*	?	?	77	·716	2·7	0	...	...	0	?	?	0	?	?	Verawal.	
...	...	1	...	...	2	20	7	...	11	?	?	70	·738	1·4	0	...	...	0	?	?	0·55	?	?	Bhavnagar.	
6	2	...	1	1	1	2	15	2	3	3	0	40	·441	2·4	0	...	...	0	0	0	0·21	0·17	+0·04	Nowgong .	Central India.
10	5	...	...	...	3	2	6	4	4	7	−43	27	·318	1·0	1	...	...	0·25	0·95	−0·70	0·98	1·20	−0·22	Sutna.	
7	3	1	1	1	1	1	6	9	3	4	−25	34	·395	1·6	0	...	...	0·08	0	+0·08	0·08	0	+0·08	Indore.	
5	...	3	4	1	...	8	5	4	8	10	−20	45	·530	1·4	0	...	...	0·05	0·14	−0·09	0·35	0·15	+0·20	Neemuch.	
...	3	1	...	2	...	16	4	4	...	?	?	62	·714	1·9	0	...	...	0	0	0	0·04	0	+0·04	Surat .	Guzerat.
...	...	1	...	3	...	13	2	11	5	5	0	37	·380	1·6	0	...	...	0·02	0·11	−0·09	1·92	0·35	+1·57	Agra . .	N.-W. P. (West).
10	1	1	...	3	...	5	2	8	3	4	−25	32	·390	1·0	0	...	...	0·04	0·07	−0·03	0·68	0·40	+0·28	Jhansi.	
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·62	0·30	+0·32	...	...	...	**Deccan.**	
7	3	3	1	1	2	3	5	5	3	13	−77	51	·533	1·5	5	...	...	2·56	1·33	+1·23	2·84	1·81	+1·03	Belgaum .	Bombay, Deccan.
...	2	6	4	3	...	2	5	8	8	8	0	35	·440	2·6	0	...	...	0·14	0·41	−0·27	0·52	0·53	−0·01	Sholapur.	
12	...	...	2	1	...	1	7	7	9	10	−10	31	·330	2·0	1	...	...	0·32	0·45	−0·13	0·32	0·52	−0·20	Poona.	
5	2	1	...	...	...	4	8	10	7	8	−13	58	·712	1·7	0	...	...	0·02	0·07	−0·05	0·02	0·07	−0·05	Malegaon .	Khandeish.
4	8	3	2	3	...	...	2	8	6	?	?	55	·628	1·5	1	...	...	0·37	0·18	+0·19	0·37	0·22	+0·15	Ahmednagar.	
1	3	3	1	3	...	1	3	15	7	5	+40	33	·374	2·2	2	...	...	0·54	0	+0·54	0·60	0·42	+0·18	Akola .	Berar.
...	...	4	1	5	...	6	13	1	7	4	+75	29	·337	2·2	1	...	...	0·47	0·02	+0·45	0·51	0·25	+0·26	Amraoti.	

* Mean of 29 days.

Table

Abstract of observations taken at 8 A.M. at 158

Meteorological Province or District.	Station.	Height of Station 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.
Central Provinces (West).	Khandwa	1,043·71	28·835	+·040	29·836	28·894	8th & 9th	28·772	27th	·122	84·7	103·6	−0·6	75·5	+1·6	89·6	+0·5	28·1	107·7	14th	61·2	5th	43·5
	Hoshangabad	1,020	28·855	+·025	29·834	28·935	8th	28·781	27th	·154	84·5	103·8	−1·0	74·5	+1·6	89·2	+0·3	29·3	107·5	22nd & 23rd	66·8	4th	40·7
	Nagpur	1,025	28·839	+·042	29·814	28·940	8th	28·762	14th	·178	86·9	104·4	−1·3	76·1*	+0·2	90·3*	−0·6	28·3	110·3	13th & 14th.	67·4	1st	42·9
Central Provinces (Central).	Seoni	2,030	27·847	+·025	29·837	27·955	8th	27·753	14th	·202	83·7	99·7	−1·7	70·8	−0·7	85·3	−1·2	28·9	104·2	6 dates	62·0	1st	42·2
	Jubbulpore	1,327·02	28·533	+·041	29·818	28·626	8th	28·455	27th	·171	82·2	101·0	−0·7	70·0	−0·7	85·5	−0·7	31·0	103·0	23rd	60·3	1st	45·7
	Saugor	1761·5	28·102	+·026	29·807	28·187	5th	28·019	27th	·168	84·0	101·3	−0·1	70·9	−1·4	86·2	−0·8	30·4	105·4	22nd, 23rd & 30th.	65·7	1st, 4th & 5th.	39·7
Central Provinces (East).	Raipur	960	28·891	+·046	29·806	28·996	8th	28·813	24th	·183	86·3	103·0	−1·2	76·4	−0·2	89·7	−0·7	26·6	108·3	23rd, 24th & 25th.	66·2	1st	42·6
Hyderabad (South).	Secunderabad	1,786·69	28·121	+·017	29·843	28·196	8th	28·065	24th	·131	83·3	101·6	−0·5	76·3	+1·4	88·9	+0·5	25·3	106·7	13th & 24th	67·4	16th	39·3
West Coast		...	...	+·022	...	...	...	...	...	...	...	89·9	0	6·6	−0·4	82·9	−0·2	14·0	...	...	...	...	20·2
Konkan	Bombay	37	29·899	+·030	29·877	29·984	11th	29·851	17th	·133	80·9	86·6	−1·5	76·5	−0·6	81·5	−1·1	10·1	89·9	18th	73·0	1st & 3rd	16·9
	Ratnagiri	110	29·808	+·031	29·857	29·883	11th	29·754	1st	·129	83·1	89·8	0	75·8	−0·8	82·8	−0·4	11·0	92·9	7th	72·4	1st, 3rd & 4th	20·5
	Mormugao	?	29·850	?	29·846	29·914	10th	29·807	16th	·107	83·6	?	?	81·2	?	?	?	?	?	?	76·0	2nd	?
	Karwar	43·87	29·877	+·012	29·857	29·919	10th	29·842	4th & 17th.	·107	80·8	90·5	+0·8	77·1	−0·6	83·8	+0·1	13·4	92·3	16th, 9th & 20th.	73·3	4th	19·0
Malabar	Mangalore	25·60	29·912	+·026	29·871	29·984	10th	29·884	3rd	·100	83·6	91·6	+0·9	79·1	+0·3	85·4	+0·6	12·5	93·3	18th	75·4	10th	17·9
	Calicut	26·53	29·907	+·013	29·865	29·970	10th	29·869	4th	·101	83·5	91·6	?	77·2	?	81·4	?	14·4	93·9	17th	71·6	9th	22·3
	Cochin	11·03	29·927	+·022	29·867	29·983	11th	29·890	3rd	·093	83·5	91·1	−0·1	78·0	−0·4	81·6	−0·3	13·1	93·3	28th	72·7	22nd	20·6
	Trivandrum	?	29·582	?	29·860	29·619	9th	29·533	3rd	·111	81·7	88·2	?	68·0	?	78·1	?	20·2	90·0	16th, 17th & 18th	65·5	2nd & 11th.	24·5
South India		...	...	+·023	...	...	...	...	...	...	...	4	0	76·5	0	[illegible]	0	19·9	...	...	...	...	29·9
Madras, South	Madura	446·60	29·482	+·032	29·866	29·554	9th	29·436	15th	·118	82·4	96·4	−4·1	75·8	−0·3	86·2	−2·2	20·6	100·4	7th	69·1	5th	31·3
Madras, South (Central).	Salem	939·91	29·010	+·024	29·891	29·080	10th	28·948	16th	·132	82·4	101·2	+0·2	76·1	+0·7	88·7	+0·5	25·1	104·4	4th, 15th & 16th	67·9	5th	36·5
	Coimbatore	1347·64	†	?	?	?	?	?	?	?	79·4	97·9	−0·3	72·4	−1·5	85·2	−0·9	25·5	101·3	6th	67·6	2nd	33·7
Coorg	Mercara	3,780·7	26·267	?	29·879	26·309	10th	26·230	3rd	·079	71·1	85·8	+1·2	65·0	+0·3	75·4	+0·8	20·8	92·2	2nd	57·7	4th	34·5
Mysore	Bangalore	2,981·46	27·004	+·013	29·886	27·060	10th	26·972	4th	·088	76·6	93·6	+0·3	69·1	−0·2	81·4	+0·1	24·5	95·2	13th, 14th & 26th.	63·0	2nd	33·2
Madras, East Coast (South).	Negapatam	15	29·903	+·019	29·849	29·965	10th	29·854	14th	·111	85·0	92·0	−0·4	79·2	+0·5	85·7	+0·1	12·8	99·1	24th	73·2	2nd	25·9
	Pamban	37	29·903	?	29·866	29·968	12th	29·861	14th	·107	85·3	91·0	?	80·4	?	85·7	?	10·6	92·8	28th	73·6	3rd	19·2
	Cuddalore	12·44	29·924	?	29·857	29·991	10th	29·867	14th	·124	84·3	92·3	?	76·5	?	84·4	?	15·8	97·3	25th	70·2	5th	27·1
	Trichinopoly	254·78	29·675	+·027	29·864	29·746	9th	29·639	15th	·107	84·3	100·6	−0·4	77·2	0	88·9	−0·2	23·4	104·1	15th	69·9	4th	34·2
	Madras	22	29·910	+·030	29·864	29·978	10th	848	14th	·130	84·8	93·5	+0·6	76·7	−0·5	85·1	+0·1	16·8	97·0	15th & 25th.	71·0	5th	26·0
Madras, East Coast (Central).	Nellore	70·82	29·825	?	29·833	29·914	9th	29·761	14th	·150	84·7	101·3	?	76·3	?	88·9	?	25·0	107·8	15th	72·1	5th	35·7
	Masulipatam	7·5	29·900	+·023	29·851	29·973	9th	29·831	14th	·142	84·8	95·5	+0·7	77·4	+0·3	86·4	+0·5	18·1	100·2	18th	74·1	1st & 5th.	26·1
Madras, Central	Cuddapah	433·36	29·472	?	29·842	29·555	10th	29·426	26th	·129	89·3	105·4	?	80·6	?	93·0	?	24·8	109·3	16th	74·8	26th	34·5
	Kurnool	923·45	28·984	?	29·843	29·066	10th	28·928	25th	·138	87·2	104·5	?	78·7	?	91·6	?	25·8	108·6	16th & 27th.	73·0	9th	35·6
	Bellary	1,474·63	28·431	+·045	29·841	28·507	10th	28·388	27th	·119	85·7	103·3	−0·7	77·2	+0·2	90·3	−0·3	26·1	106·5	16th	71·8	1st	34·7
Madras, East Coast (North).	Rajahmundry	112	29·799	?	29·850	29·883	9th	29·744	24th	·139	84·8	101·5	?	79·0	?	90·3	?	22·5	105·1	15th	73·1	25th	32·0
	Cocanada	26	29·890	?	29·853	29·971	9th	29·814	25th	·157	83·9	95·0	?	79·6	?	87·3	?	15·4	98·9	19th	74·6	25th	24·3
	Vizagapatam	31	29·864	+·019	29·834	29·965	9th	29·782	25th	·183	85·1	90·1	+1·3	81·8	+0·8	86·0	+1·1	8·3	94·9	6th	77·4	25th	17·5
	Gopalpur	21·45	29·840	−·001	29·803	29·952	9th	29·755	14th	·197	81·8	85·6	+1·7	78·5	0	82·1	+0·9	7·1	91·2	2nd	75·3	1st	15·9
Hill Stations		...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Beluchistan	Quetta	5,502·26	24·675	+·069	?	24·766	19th	24·556	27th	·210	58·3	71·6	−1·6	45·3	−0·8	58·5	−1·2	26·3	81·4	21st	32·3	16th	49·1
	Khelat	?	?	?	?	?	...	?	...	?	?	74·3	?	37·6	?	?	?	36·7	86·0	21st	24·0	16th	62·0

* Mean of 28 days. † Imperfect.

I—*continued.*

stations in India, Burma, &c., in April 1891—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 1891.	Normal rainfall for period 1st March to 30th April.	Variation from normal of period.	Station.	Meteorological Province or District.
2	2	...	...	1	5	1	12	7	7	6	+17	35	·423	1·5	1	...	...	1·10	0·06	+1·04	1·10	0·13	+0·97	Khandwa .	Central Provinces (West).
3	1	5	1	1	2	11	5	1	5	3	+67	35	·413	1·8	0	...	...	0	0	0	0	0·14	−0·14	Hoshangabad.	
1	3	2	2	2	4	5	3	8	7	5	+40	34	·423	2·6	2	...	...	0·44	0·32	+0·12	1·30	0·81	+0·49	Nagpur.	
...	4	2	2	...	4	9	4	5	6	4	+50	38	·430	2·1	3	...	...	1·07	0·21	+0·86	2·39	0·74	+1·65	Seoni .	Central Provinces (Central).
4	1	...	3	4	8	5	5	...	4	3	+33	35	·387	1·8	0	...	...	0	0·13	−0·13	0·21	0·45	−0·24	Jubbulpore.	
...	2	4	...	7	...	5	8	4	4	4	0	25	·286	1·0	0	...	...	0·05	0	+0·05	0·22	0·14	+0·08	Saugor.	
4	...	2	3	1	3	8	7	2	7	6	+17	39	·480	3·2	2	...	...	1·05	0·48	+0·57	3·93	1·08	+2·85	Raipur .	Central Provinces (East).
5	...	2	3	1	4	4	5	6	5	5	0	51	·587	3·2	2	...	...	1·15	0·79	+0·36	1·78	1·16	+0·62	Secunderabad	Hyderabad (South).
...	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1·55	1·21	+0·34	...	...	...	**West Coast.**	
1	10	3	3	3	5	1	...	4	10	11	−9	75	·796	4·2	0	...	...	0	0	0	0·20	0	+0·20	Bombay .	Konkan.
3	9	3	...	...	1	7	...	7	9	11	−18	70	·796	1·9	0	...	...	0	0·05	−0·05	0·02	0·05	−0·03	Ratnagiri.	
2	1	1	6	6	3	1	2	8	9	?	?	76	·869	2·2	1	...	...	0·20	?	?	0·20	?	?	Mormugao.	
...	3	17	...		...	1	5	4	4	?	?	79	·825	1·7	0	...	...	0·05	0·28	−0·23	0·05	0·28	−0·23	Karwar.	
11	10	4	3	...	...	...	...	2	3	4	−25	77	·887	2·8	1	...	...	0·55	0·61	−0·06	0·80	0·61	+0·19	Mangalore .	Malabar.
11	7	1	3	3	...	1	...	4	10	?	?	80	·870	3·9	5	...	...	4·78	2·81	+1·97	5·27	3·30	+1·97	Calicut.	
10	3	11	4	...	1	1	...	...	5	?	?	77	·884	4·2	7	...	...	3·07	3·18	−0·41	7·79	5·30	+2·49	Cochin.	
...	12	6	6	2	2	...	...	2	8	?	?	79	·858	3·7	8	...	...	3·78	?	?	7·01	?	?	Trivandrum.	
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1·03	0·73	+0·30	...	...	...	**South India.**	
13	2	4	4	3	1	1	...	2	3	4	−25	71	·798	2·8	3	...	...	7·13	1·01	+6·12	8·33	1·20	+7·13	Madura .	Madras, South.
3	...	14	5	...	4	2	2	...	3	5	−40	75	·841	2·8	2	...	...	1·33	1·44	−0·11	1·62	2·40	−0·78	Salem .	Madras, South (Central).
...	5	2	7	2	8	3	2	1	3	3	0	78	·793	4·6	3	...	..	1·48	1·41	+0·07	1·84	2·02	−0·18	Coimbatore.	
...	8	...	3	...	...	...	3	16	2	3	−33	76	·570	2·4	5	...	...	4·95	2·19	+2·76	5·15	3·15	+2·00	Mercara .	Coorg.
...	1	...	5	5	8	7	3	1	1	4	−75	67	·620	2·9	2	...	...	0·75	0·78	−0·03	1·62	1·30	+0·32	Bangalore	Mysore.
1	1	...	2	9	7	4	4	2	6	5	+20	73	·876	4·5	0	...	...	0	0·34	−0·34	0	0·77	−0·77	Negapatam	Madras, East Coast (South).
1	...	1	7	4	12	5	...	...	5	?	?	71	·871	3·5	2	...	...	0·82	?	?	1·12	?	?	Pamban.	
...	...	...	...	1	7	8	8	6	4	?	?	80	·951	3·5	1	...	...	0·23	0·87	−0·64	0·23	1·25	−1·02	Cuddalore.	
3	2	2	3	8	4	3	1	4	4	4	0	71	·826	3·1	1	...	...	0·32	1·40	−1·08	0·97	1·97	−1·00	Trichinopoly.	
...	...	...	...	2	20	6	2	...	7	8	−13	73	·887	4·1	0	...	...	0	0·21	−0·21	0	0·42	−0·42	Madras.	
..	...	...	...	19	11	...	...	...	9	?	?	77	·920	3·8	0	...	...	0	0·11	−0·11	0·04	0·33	−0·29	Nellore .	Madras, East Coast (Central).
4	...	1	...	2	16	6	...	1	3	9	−67	82	·977	2·3	0	...	...	0	0·08	−0·08	0·66	0·16	+0·50	Masulipatam.	
...	...	5	5	13	3	3	1	...	?	?	?	50	·695	2·7	2	...	...	0·52	0·39	+0·13	0·52	0·53	−0·01	Cuddapah.	Madras (Central).
27	...	...	...	1	2	...	...	...	?	?	?	49	·626	1·5	3	...	...	0·92	0·60	+0·32	1·15	0·94	+0·21	Kurnool.	
20	...	1	...	...	1	1	4	3	5	5	0	54	·666	0·8	0	...	...	0·03	0·44	−0·41	0·14	0·65	−0·51	Bellary.	
9	...	...	...	...	7	8	3	2	?	?	?	70	·851	4·7	0	...	...	0·06	0·88	−0·82	0·06	1·13	−1·07	Rajahmundry	Madras, East Coast (North).
1	1	...	...	...	3	16	5	4	6	?	?	70	·819	2·9	0	..	...	0	0·42	−0·42	1·82	0·60	+1·22	Cocanada.	
...	2	...	...	...	...	7	18	3	3	4	−25	67	·797	3·3	1	...	...	0·50	0·05	+0·45	0·78	0·45	+0·33	Vizagapatam.	
1	1	1	1	...	11	14	...	1	17	15	+13	81	·864	0·6	2	...	...	0·33	0·60	−0·27	3·11	1·27	+1·84	Gopalpur.	
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	**Hill Stations.**	
26	...	...	...	2	1	...	...	1	4	4	0	54	·269	3·6	4	...	...	0·87	1·20	−0·33	1·46	3·15	−1·69	Quetta .	Beluchistan.
...	...	...	...	...	...	14	..	16	?	?	?	?	?	?	2	...	...	0·29	?	?	?	?	?	Khelat.	

Table

Abstract of observations taken at 8 A.M. at 158

Meteorological Province or District.	Station.	Height of Station 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.
Northern India	Murree	6,343·86	23·857	+·034	?	23·926	9th	23·738	15th	·188	56·1	65·9	−2·1	49·6	−2·2	57·8	−2·2	16·3	75·6	21st	32·7	15th	42·9
	Simla	7,274	23·069	?	?	23·145	8th	23·019	14th	·126	57·5	67·6	−3·8	51·3	−0·9	59·5	−2·4	16·3	75·7	23rd	39·4	29th	36·3
	Mussoorie	?	23·586	?	?	23·650	19th	23·527	13th	·123	59·6	72·8	?	49·7	?	61·3	?	23·1	81·3	22nd	40·0	28th	41·3
	Ranikhet	6,068·75	24·104	+·027	?	24·173	8th	24·065	14th	·108	64·0	74·0	−0·1	56·9	−0·1	65·5	−0·1	17·1	80·5	23rd	51·0	29th	29·5
	Kalimpong	?	25·995	?	?	26·047	7th	25·942	17th	·105	64·3	75·6	?	60·2	?	68·0	?	15·4	81·1	17th	53·8	4th	27·3
	Darjeeling	7,421·1	22·966	+·012	?	23·017	20th	22·881	13th	·136	55·6	62·8	+1·4	47·5*	+0·6	55·2*	+1·0	15·3	70·4	17th & 18th.	39·4	11th	31·0
Central India	Mount Abu	3,945	26·075	+·026	?	26·137	5th	25·989	27th	·148	75·8	83·9	−1·6	68·0	0	76·0	−0·8	15·9	88·7	21st	62·9	15th	25·8
	Pachmarhi	3,511	26·494	+·043	?	26·553	9th	26·425	27th	·128	80·4	92·0	−0·2	70·2	+1·0	81·1	+0·4	21·8	95·7	22nd	61·2	1st	34·5
South India	Wellington	6,200	24·311	+·050	?	24·363	10th	24·282	3rd & 27th	·081	66·7	75·0	−1·0	54·5	−1·6	64·7	−1·3	20·5	77·7	15th & 26th.	47·2	2nd	30·5
Extra India.																							
Persia	Meshed	?	?	?	?	?	?	?	?	?	54·9	69·3	?	50·4	?	59·9	?	18·9	81·0	6th & 18th.	36·0	14th	45·0
	Bushire	14	29·916	?	29·887	30·053	11th	29·779	19th	·274	76·0	81·7	?	69·4	?	75·6	?	12·3	96·8	20th	65·0	13th & 22nd.	31·8
Arabia	Baghdad	?	29·620	?	?	29·746	6th	29·384	27th	·362	68·1	85·1	?	53·8	?	69·5	?	31·3	92·3	28th	44·5	7th	47·8
	Aden	94·1	29·865	?	29·891	29·968	11th	29·827	30th	·141	82·2	88·8	?	77·0	?	82·9	?	11·8	94·8	24th	69·1	10th	25·7
Arabian Sea Islands.	Minicoy	10·5	29·948	?	29·883	30·013	11th	29·912	3rd	·101	84·5	90·6	?	82·8	?	86·7	?	7·8	93·2	18th	75·4	19th	17·8

* Mean of 28 days.

I —*concluded.*

stations in India, Burma, &c., in April 1891 —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 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 1891.	Normal rainfall for period, 1st March to 30th April.	Variation from normal of period.	Station.	Meteorological Province or District.
5	3	5	3	6	1	1	2	4	9	9	0	47	·204	4·5	6	...	...	3·80	3·79	+0·01	15·03	7·40	+7·63	Murree.	Northern India.
4	2	4	2	11	1	2	3	1	?	3	?	44	·206	5·1	3	...	...	2·13	2·05	+0·08	3·83	4·80	−0·97	Simla.	
...	8	6	7	2	1	...	...	6	?	?	?	56	·291	2·6	2	...	...	0·94	1·59	−0·65	3·20	4·35	−1·15	Mussoorie	
17	2	1	...	1	1	5	1	2	4	3	+33	47	·273	3·2	1	...	...	0·26	1·32	−1·06	4·02	3·78	+0·24	Ranikhet.	
5	4	1	1	2	1	3	4	8	?	?	?	39	·449	3·5	5	...	...	0·91	?	?	?	?	?	Kalimpong.	
5	...	5	6	2	2	7	3	...	9†	8	+13	75	·332	3·5	3	...	...	0·97	4·73	−3·76	4·44	6·58	−2·14	Darjeeling.	
3	5	2	3	2	...	2	2	11	7	8	−13	27	·250	2·1	0	...	...	0	0	0	0·66	0·06	+0·60	Mount Abu	Central India.
1	...	...	3	2	6	4	10	4	6	5	+20	27	·265	2·1	0	...	...	0·12	0·08	+0·04	0·32	0·39	−0·07	Pachmarhi.	
22	...	2	3	3	...	...	...	...	2	3	−33	63	·402	2·4	7	...	...	5·58	2·03	+3·55	7·80	4·24	+3·56	Wellington .	South India.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	**Extra India.**	
6	2	3	5	4	2	1	2	5	?	?	?	?	?	4·5	10	...	...	3·41	?	?	4·51	?	?	Meshed .	Persia.
...	3	7	...	4	...	4	...	12	9	?	?	61	·539	0	0	...	...	0·03	0·74	−0·71	0·24	1·46	−1·22	Bushire.	
...	19	4	1	...	4	...	...	2	6	?	?	56	·376	0	1	...	...	0·50	?	?	1·10	?	?	Baghdad .	Arabia.
3	...	6	20	...	...	...	...	...	11	15	−27	72	·789	4·3	1	...	...	1·07	0·22	+0·85	2·41	0·73	+1·68	Aden .	
1	3	2	3	2	...	2	8	6	7	?	?	78	·924	3·5	2	...	...	0·59	?	?	1·19	?	?	Minicoy .	Arabian Sea Islands.

† Mean of 29 days.

Table

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

Station.	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 to 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.
Murree	23·881	23·857	·023	23·861	+·039	?	65·5	49·0	16·5	75·6	32·7	42·9	60·0	61·2	56·2	−2·2	41·5	48·0	48·9	46·1
Chamba	26·916	26·839	·077	26·889	+·024	?	79·6	55·5	23·1	89·3	51·3	38·0	68·9	76·1	67·0	−2·0	51·2	57·6	59·1	56·0
Kailang	20·856	20·816	·040	20·848	+·042	?	47·4	27·4	20·0	53·5	12·0	41·5	40·7	42·6	36·0	−4·2	25·4	34·1	35·8	31·8
Simla	23·096	23·056	·039	23·069	?	?	67·6	51·1	16·4	75·7	39·4	36·3	60·9	64·1	58·4	−1·2	42·3	48·4	50·2	47·0
Peshawar	28·803	28·720	·083	28·757	+·067	29·872	82·9	57·7	25·2	91·0	50·2	40·8	75·9	80·1	70·0	−2·2	53·6	64·3	65·5	61·1
Lahore	29·137	29·058	·079	29·093	+·048	·770	91·9	61·5	30·4	103·1	54·0	49·1	83·7	89·8	76·6	−2·5	57·4	65·9	66·9	63·4
Ludhiana	·002	28·917	·085	28·954	+·027	·737	93·8	64·2	29·7	104·2	57·2	47·0	86·0	91·6	79·0	−1·3	59·7	67·9	69·0	65·4
Mooltan	·448	29·344	·104	29·391	+·057	·779	96·6	66·5	30·1	106·7	57·7	49·0	82·3	93·8	81·2	0	58·2	70·6	78·7	69·2
Jacobabad	·676	·547	·129	·606	+·052	·749	101·5	70·6	30·9	111·5	57·2	54·3	90·9	98·5	85·7	+0·8	61·5	Imperfect.		
Hyderabad	·725	·632	·093	·677	+·017	·746	101·5	72·1	29·4	109·2	65·1	44·1	92·0	98·3	82·0	−3·2	62·0	68·0	69·5	66·5
Kurrachee	·828	·743	·085	·784	+·004	·786	90·9	73·3	17·5	98·9	65·9	33·0	84·4	86·9	80·3	+1·2	Imperfect.	77·1	79·3	?
Jeypore	28·445	28·333	·112	28·384	+·035	·759	99·8	69·5	30·3	106·1	59·8	46·3	91·2	97·4	84·7	+0·1	56·8	66·6	67·9	63·8
Ajmere	·277	·170	·106	·217	+·031	·770	98·5	70·0	28·5	104·3	57·7	46·6	90·1	96·3	85·0	+1·3	62·9	68·0	70·7	67·2
Mount Abu	26·093	26·015	·078	26·049	+·017	?	84·1	68·0	16·1	88·6	62·9	25·7	78·8	82·1	75·5	+0·2	53·4	58·1	59·3	56·9
Chakrata	23·316	23·273	·043	23·295	+·057	?	70·8	50·4	20·3	76·3	42·9	33·4	64·2	61·6	59·1	−0·5	43·6	52·4	51·5	49·1
Ranikhet	24·123	24·072	·051	24·087	+·024	?	74·2	56·8	17·4	80·5	51·0	29·5	68·8	70·2	64·5	−0·2	46·5	53·7	54·4	51·6
Pithoragarh	·770	·711	·059	·730	+·049	?	77·2	56·6	20·6	83·9	51·0	32·9	70·5	75·7	66·5	−0·1	48·0	56·9	57·4	54·1
Dehra	27·609	27·520	·089	27·553	+·021	·732	89·4	61·8	27·7	95·3	54·9	40·4	80·2	86·1	75·4	−1·5	54·7	62·1	62·8	59·9
Roorkee	28·928	28·826	·102	28·868	+·019	·722	96·6	63·6	33·0	104·7	55·4	49·3	86·9	94·0	80·0	−1·2	55·7	65·2	66·0	62·3
Meerut	29·091	·987	·103	29·032	+·037	·733	97·3	66·0	31·3	105·2	58·0	47·2	88·9	94·3	81·4	−0·8	60·1	65·4	66·5	64·0
Agra	·315	29·184	·131	·241	+·049	·752	101·3	71·8	29·6	108·5	62·8	45·7	92·3	99·7	86·6	+0·2	58·3	67·7	69·2	65·1
Lucknow	·462	·341	·121	·400	+·032	·724	101·4	69·1	32·2	107·3	59·9	47·4	91·5	99·2	86·0	−1·4	59·3	67·8	69·2	65·4
Allahabad	·526	·396	·130	·456	+·030	·715	102·2	70·9	31·3	108·9	61·8	47·1	93·1	101·1	86·8	−0·8	60·1	68·3	69·4	65·9
Ghazipur	·607	·477	·131	·539	+·001	·710	101·6	72·5	29·1	106·4	64·7	41·7	93·6	99·1	86·9	0	62·9	72·6	73·0	69·5
Nowgong	·089	28·964	·124	·022	+·027	·724	102·3	70·7	31·6	108·6	58·3	50·3	93·6	100·5	86·5	−0·8	60·1	70·9	74·3	68·4
Sutna	28·799	·665	·134	28·727	+·021	·714	101·1	70·4	30·7	107·7	60·7	47·0	94·2	99·6	86·1	−0·4	57·8	66·4	66·8	63·6
Durbhunga	29·661	29·519	·142	29·588	+·016	·707	97·5	69·4	28·1	103·9	59·2	44·7	87·4	96·8	83·9	−0·5	61·2	71·6	71·4	69·1
Patna	·628	·499	·130	·562	+·066	·695	100·5	71·9	28·5	107·0	61·3	45·7	92·0	98·0	85·4	−1·2	61·2	68·8	68·8	66·3
Hazaribagh	27·848	27·756	·093	27·804	+·030	·722	98·3	72·3	26·0	103·5	65·5	38·0	91·2	95·7	85·0	+1·1	57·0	63·8	64·3	61·7
Darjeeling	22·983	22·914	·069	22·946	+·007	?	62·8	47·6	15·1	70·4	39·4	31·0	58·5	58·6	54·1	+0·4	43·4	52·6	53·5	49·8
Pedong	25·273	25·179	·095	25·224	+·009	?	73·5	57·0	16·5	79·2	51·1	28·1	67·6	68·9	64·1	+1·6	53·7	61·8	61·4	58·9
Berhampore	29·765	29·621	·144	29·691	+·013	·706	100·1	73·0	27·1	106·2	63·2	43·0	88·3	98·5	85·3	−0·9	66·7	74·6	73·7	71·6
Burdwan	·751	·607	·143	·677	+·025	·722	100·9	74·4	26·5	106·5	65·6	40·9	89·2	98·7	86·1	−1·1	68·7	73·7	72·6	71·8
Calcutta (Alipore)	·828	·706	·122	·765	+·014	·731	96·8	76·2	20·6	102·7	68·1	34·6	88·9	94·6	86·0	+1·3	71·4	77·7	76·1	75·1
Calcutta (Chowringhee)	·836	?	?	?	?	?	98·2	76·5	21·7	103·4	69·7	33·7	90·5	?	87·4	?	73·4	80·4	?	?
Saugor Island	·839	·723	·116	·777	+·020	·746	90·4	80·7	9·8	93·8	76·4	17·4	86·7	87·7	84·1	+0·7	77·5	80·7	81·4	79·9
Dacca	·844	·706	·137	·774	+·012	·744	94·2	73·5	20·7	97·5	65·8	31·7	86·3	91·5	82·9	+0·6	70·0	78·2	78·4	75·5
Chittagong	·833	·723	·110	·773	+·025	·807	89·7	73·0	16·7	95·2	65·2	30·0	85·8	86·1	80·3	−0·2	70·3	76·9	77·9	75·0
Demagiri	Not recorded.						89·9	70·5	19·3	93·4	59·1	34·3	82·7	89·0	80·0	+1·0	?	?	?	?
Tura							90·0	71·7	18·3	96·8	60·9	35·9	83·2	87·2	80·1	+2·2	?	70·0	70·1	?
Dhubri	·733	·576	·157	·649	−·010	·718	91·5	69·4	22·0	101·5	62·1	39·4	80·4	90·0	79·3	+1·0	65·3	71·0	71·1	69·1
Sibsagar	·521	·388	·133	·452	−·047?	·746	81·3	66·1	15·3	88·6	69·4	19·2	74·5	79·8	72·6	−0·4	65·2	70·3	72·6	69·3

II.

at 88 stations in India, Burma, &c., in April 1891.

Vapour Tension.					Humidity.					Cloud.				Wind Direction. Number of Winds from											Wind Steadiness.		Wind Velocity.		Station.
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.	
·186	·213	·223	·207	−·025	56	43	43	47	−2	5·2	6·8	6·0	+0·6	1	3	1	6	27	10	2	3	7	S 37° E	S 40° E	36	16	218	212	Murree.
·320	·349	·308	·326	+·007	70	50	36	52	+ 3	5·8	6·7	6·2	−0·3	14	3	1	...	3	2	1	7	29	N 53° W	N 7° E	53	15	132	113	Chamba.
·124	·143	·153	·140	−·021	81	56	57	65	+ 6	5·0	7·0	6·0	0	...	...	...	...	...	3	10	36	11	S 87° W	S 61° W	85	72	48	50	Kailang.
·181	·211	·222	·207	−·039	49	40	39	43	− 4	5·2	6·4	6·0	+1·9	...	1	2	1	9	12	23	9	2	S 30° W	S 69° W	59	38	?	?	Simla.
·365	·461	·450	·425	+·014	76	52	46	58	+ 5	4·3	5·2	4·8	+0·2	20	3	12	3	3	2	1	6	10	N 1° W	N 10° E	23	19	72	101	Peshawar.
·421	·400	·357	·393	+·007	78	36	26	47	+ 10	3·0	4·0	3·5	+1·0	8	8	3	5	2	3	1	12	18	N 44° W	N 19° W	41	26	61	80	Lahore.
·455	·445	·413	·438	+·034	76	37	28	47	+ 3	4·6	5·8	5·2	+2·3	10	16	...	...	1	2	1	20	10	N 54° W	N 59° W	56	27	67	50	Ludhiana.
·381	·601	·788	·590	+·157	58	54	50	54	+10	2·0	2·9	2·5	+0·8	8	...	20	...	3	...	10	1	18	N 14° W	N 26° W	30	13	37	59	Mooltan.
?	?	?	?	?	?	?	?	?	?	2·8	3·7	3·2	+0·5	10	4	6	9	8	9	7	2	5	S 47° E	S 84° E	19	18	102	94	Jacobabad.
·132	·371	·330	·378	−·126	54	25	18	32	−10	5·7	5·7	5·7	+4·6	...		3	...	4	...	45	1	7	S 50° W	S 53° W	71	58	187	245	Hyderabad.
?	·842	·902	?	?	?	71	70	?	?	0·9	1·3	1·1	−0·9	...	...	1	...	...	...	24	29	6	S 76° W	S 62° W	85	80	299	342	Kurrachee.
·306	·349	·318	·324	+·010	42	24	18	28	0	3·9	4·9	4·4	+2·3	...	7	3	1	4	3	11	13	18	N 73° W	N 39° W	48	56	92	134	Jeypore.
·493	·412	·433	·446	+·052	67	29	25	40	+ 5	2·2	3·3	2·8	+0·8	5	5	5	...	7	3	7	23	5	S 87° W	S 74° W	27	52	118	129	Ajmere.
·244	·250	·248	·254	+·013	36	25	23	28	0	1·9	3·3	2·6	+0·3	...	6	1	...	4	5	13	18	13	S 88° W	S 76° W	55	53	168	185	Mount Abu.
·216	·274	·247	·245	+·026	59	47	42	49	+ 6	3·6	5·2	4·4	+0·8	4	...	6	10	3	6	16	15	...	S 33° W	S 68° W	30	19	149	143	Chakrata.
·213	·259	·262	·244	−·014	47	37	36	40	− 4	3·7	5·1	4·4	+1·2	7	...	...	1	4	3	39	4	2	S 42° W	S 62° W	72	47	87	81	Ranikhet.
·247	·327	·284	·286	+·011	54	44	33	44	+ 1	3·7	4·5	4·1	+0·7	30	...	1	3	2	9	15	...	...	S 15° W	S 14° E	35	31	88	88	Pithoragarh.
·343	·334	·284	·320	?	63	33	23	36	?	3·7	4·5	4·1	+1·3	...	6	8	1	2	2	6	20	14	N 75° W	N 79° W	55	21	50	62	Dehra.
·342	·337	·270	·317	−·003	59	27	17	34	0	0·9	2·0	1·5	−0·6	18	1	1	2	1	2	...	27	8	N 81° W	N 73° W	77	10	77	76	Roorkee.
·445	·317	·281	·348	−·056	70	24	17	37	− 1	2·6	3·8	3·2	+1·2	4	...	...	3	...	..	...	34	19	N 73° W	N 53° W	76	44	72	59	Meerut.
·314	·364	·307	·328	−·012	40	25	16	27	− 1	2·2	3·8	3·0	+1·6	...	1	1	...	5	...	17	...	36	N 71° W	N 84° W	59	44	122	114	Agra.
·378	·368	·312	·353	−·059	54	25	17	32	− 2	2·0	2·7	2·3	+0·3	1	2	1	2	1	2	14	24	13	S 89° W	N 53° W	66	44	135	106	Lucknow.
·381	·364	·304	·351	−·046	50	23	15	29	− 3	2·2	3·1	2·7	+1·3	3	4	3	1	1	3	4	16	25	N 62° W	N 52° W	61	25	114	84	Allahabad.
·452	·523	·465	·480	+·071	56	33	25	38	+ 4	1·3	1·2	1·3	+0·4	6	1	1	4	...	...	8	27	13	N 82° W	N 82° W	63	43	80	87	Ghazipur
·382	·454	·501	·446	+·066	51	29	26	35	+ 4	1·4	3·7	2·6	+0·4	...	5	1	3	3	3	2	32	11	N 79° W	N 76° W	60	54	61	68	Nowgong.
·333	·308	·251	·297	+·047	45	19	13	26	+ 4	0·8	2·3	1·6	−0·3	2	3	1	2	1	8	6	18	19	N 83° W	N 60° W	54	55	106	167	Sutna.
·536	·568	·435	·513	−·048	74	44	25	48	− 3	0·4	0·2	0·3	−0·8	5	...	1	6	8	1	12	22	5	S 63° W	S 24° E	40	8	156	138	Durbhunga.
·407	·400	·317	·375	−·092	51	27	17	32	− 9	1·3	1·5	1·4	−0·6	1	2	4	6	1	1	1	41	3	N 82° W	N 38° W	58	27	114	107	Patna.
·279	·254	·213	·249	−·049	35	17	13	22	− 7	1·6	4·1	2·9	+0·3	...	4	...	1	...	4	8	15	28	N 70° W	N 74° W	70	49	254	201	Hazaribagh
·246	·338	·361	·316	−·004	75	70	73	73	− 2	4·4	5·8	5·1	−1·0	5	...	8	3	1	2	28	11	2	S 56° W	S 72° W	46	49	236	202	Darjeeling.
·379	·490	·461	·443	+·017	81	72	66	73	0	3·1	8·1	5·6	+0·2	...	1	6	4	15	16	2	...	...	S 37° E	?	79	?	?	?	Pedong.
·577	·685	·502	·588	−·038	71	53	28	50	−9	2·9	2·8	2·8	−0·3	...	2	1	3	2	16	22	12	2	S 40° W	S 23° W	62	32	110	124	Berhampore.
·642	·633	·460	·586	−·066	76	46	25	50	−4	3·0	3·8	3·4	+1·0	5	8	..	1	3	10	13	15	5	S 68° W	S 40° W	44	40	110	113	Burdwan.
·711	·805	·663	·726	−·085	78	59	42	60	−11	2·1	2·1	2·1	−0·6	...	2	...	...	2	18	24	11	3	S 42° W	S 3° W	72	73	130	177	Calcutta (Alipore).
·788	·904	?	?	?	86	64	?	?	?				Not r	ecor	ded.														Calcutta (Chowringhee).
·906	·971	·992	·956	+·016	86	76	75	79	−1	5·1	3·6	4·4	−0·1	...	...	...	...	2	38	18	1	1	S 14° W	S 20° W	88	76	434	401	Saugor Island.
·695	·862	·801	·786	−·019	83	69	55	69	−4	3·9	4·8	4·4	+0·6	..	1	...	2	5	41	7	3	1	S 4° W	S 4° E	80	60	212	163	Dacca.
·717	·813	·851	·793	−·024	87	66	69	74	−3	5·0	3·6	4·3	+0·3	...	1	2	1	6	14	18	7	3	S 30° W	S 12° W	51	37	138	169	Chittagong.
?	?	?	?	?	?	?	?	?	?	0·8	1·5	1·2	−0·5	2	...	...	1	43	9	3	2	...	S 33° E	S 36° W	86	6	?	?	Demagiri.
?	·586	·543	?	?	?	53	44	?	?	3·2	3·5	3·3	−0·1	...	...	1	6	13	17	21	2	...	S 1° W	S 5° W	67	67	?	?	Tura.
·574	·635	·512	·574	−·076	80	62	41	61	−7	2·9	2·7	2·8	−0·4	5	1	13	13	2	1	18	5	2	S 52° E	N 74° E	9	32	188	192	Dhubri.
·612	·687	·706	·668	+·002	95	81	71	82	+1	6·7	6·5	6·6	−0·3	...	1	50	4	3	1	1	...	...	N 51° E	N 59° E	87	51	48	68	Sibsagar.

Table

Abstract of observations recorded at 10 A.M. and 4 P.M. at 88 stations

Station.	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 to 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.
Silchar	29·798	29·666	·132	29·733	+·010	29·789	90·2	68·3	21·9	96·1	57·9	38·2	81·7	86·4	78·1	+0·4	66·4	73·5	74·0	71·3
False Point	·846	·732	·114	·787	+·004	·750	89·9	77·6	12·4	97·5	71·1	26·4	87·7	86·6	82·1	+0·1	75·6	80·0	79·9	78·5
Cuttack	·779	·641	·138	·715	+·018	·737	103·4	76·8	26·6	107·9	71·8	36·1	92·5	99·9	87·5	+1·1	73·6	77·5	77·3	76·2
Sambalpur	·381	·240	·140	·315	+·052	·720	101·9	74·8	27·1	108·5	69·4	39·1	91·8	100·3	88·0	−1·9	67·9	73·5	73·2	71·5
Raipur	28·896	28·745	·151	28·816	+·034	·703	103·2	76·1	27·1	108·8	63·2	45·6	94·6	101·1	89·9	0	63·0	70·2	71·2	68·1
Khandwa	·834	·695	·139	·760	+·027	·739	103·7	75·5	28·2	107·7	66·2	41·5	94·0	101·6	90·1	+0·9	59·9	69·8	71·5	67·1
Hoshangabad	·861	·716	·146	·784	+·018	·742	104·1	74·4	29·6	107·7	66·6	41·1	94·5	102·5	89·9	+0·5	61·1	70·1	72·0	67·8
Saugor	·108	·987	·120	·043	+·019	?	101·7	?	?	105·6	?	?	92·9	99·5	?	?	?	65·2	65·6	?
Jubbulpore	·539	·398	·141	·464	+·033	·740	101·5	70·1	31·4	106·0	60·2	45·8	92·1	99·6	86·3	+0·1	60·1	67·4	69·0	65·5
Pachmarhi	26·510	26·401	·109	26·451	+·032	?	92·2	?	?	95·7	?	?	85·0	89·7	?	?	?	60·6	61·3	?
Seoni	27·868	27 752	·116	27·805	+·026	·736	100·0	70·6	29·4	104·4	61·5	42·9	89·4	91·1	85·1	+1·0	61·6	66·8	68·3	65·5
Nagpur	28·850	28·699	·151	28·770	+·047	·726	104·8	75·9	28·9	110·4	67·3	43·1	94·6	102·2	90·5	+0·2	61·2	69·1	70·7	67·0
Chanda	29·243	29·099	·143	29·166	+·048	·734	105·0	74·8	30·2	109·9	65·7	44·2	93·2	102·7	90·2	−1·0	66·3	71·6	73·6	70·5
Sironcha	·482	·300	·182	·386	−·006?	·722	105·9	80·7	25·2	110·9	75·1	35·8	91·7	103·5	93·5	+0·2	69·0	73·6	74·4	72·4
Chikalda	26·369	26·268	·101	26·313	+·024	?	91·8	72·4	19·4	95·3	63·3	32·0	83·6	89·8	83·1	+0·2	57·8	61·9	63·2	61·0
Buldana	27·772	27·648	·124	27·705	+·022	·725	99·9	75·9	24·0	103·3	67·3	36·0	90·9	96·2	87·8	−0·1	Imperfect	64·5	65·3	?
Akola	28·956	28·807	·149	28·875	+·037	·740	105·5	74·3	31·3	108·6	65·9	42·7	94·4	104·3	90·4	+0·2	60·0	68·1	69·5	65·9
Makhla			Imperfect.																	
Deesa	29·417	29·302	·115	29·355	+·027	·768	104·2	71·7	32·5	109·5	60·8	48·7	92·1	101·6	88·1	+0·8	61·6	68·9	68·4	66·3
Bombay	·906	·792	·114	·847	+·036	·824	87·2	76·5	10·7	90·7	72·8	17·9	83·6	84·5	81·1	−1·5	72·2	75·9	76·3	74·8
Poona	28·091	27·957	·134	28·030	+·040	·783	102·6	68·7	33·9	105·4	63·4	42·0	92·0	97·6	84·8	+0·2	58·6	64·5	66·4	63·2
Sholapur	·326	28·166	·160	·245	+·040	·742	105·3	75·8	29·5	108·3	71·5	36·8	94·7	102·7	89·6	+0·8	65·5	71·0	74·5	70·4
Ratnagiri	29·818	29·712	·106	29·763	+·036	·809	90·2	75·8	14·4	102·4	72·2	30·2	87·1	86·4	81·9	−0·5	71·9	76·9	77·3	75·4
Karwar	·893	·784	·108	·836	+·023	·812	90·4	78·8	11·5	92·3	74·7	17·6	86·1	87·6	83·8	+1·2	75·6	77·4	78·4	77·1
Belgaum	27·414	27·284	·130	27·352	+·027	·766	95·5	67·5	28·0	99·4	64·6	34·8	86·4	89·4	79·5	+0·2	62·8	67·2	70·4	66·8
Secunderabad	28·129	·993	·136	28·060	+·031	·751	101·7	76·3	25·4	106·7	67·5	39·2	91·8	98·2	87·8	0	67·9	73·7	75·2	72·3
Vizagapatam	29·884	29·768	·116	29·823	+·034	·791	90·4	81·8	8·6	95·0	77·5	17·5	89·4	89·0	85·0	−1·3	72·8	76·6	78·6	76·0
Bellary	28·430	28·281	·149	28·354	+·034	·740	103·4	77·2	26·2	106·6	71·9	34·7	92·7	100·3	89·2	−0·3	66·0	74·1	74·5	71·5
Madras*	29·836	29·862	·107	29·866	+·043	·814	?	?	?	Not received.										
Salem	29·015	28·852	·163	28·943	+·019	·806	101·3	76·1	25·2	104·4	68·0	36·4	89·2	97·0	86·5	+0·5	74·0	78·2	77·7	76·6
Mercara	26·283	26·178	·105	26·230	+·038	·846	84·8	64·6	20·2	92·0	57·9	34·1	75·6	77·3	72·5	−0·5	62·5	67·8	69·1	66·4
Trichinopoly	29·685	29·526	·159	29·615	+·030	·819	100·8	77·2	23·6	104·1	69·9	34·2	91·0	98·2	87·1	+0·1	74·0	77·0	76·9	76·0
Cochin	·939	·823	·116	·879	+·026	·817	91·2	78·3	12·9	93·3	72·7	20·6	87·6	88·9	84·1	−0·3	75·1	79·5	80·1	78·2
Wellington	24·316	24·239	·077	24·278	+·040	?	75·1	54·6	20·5	77·9	47·2	30·7	70·3	70·0	65·1	+0·2	52·1	59·5	60·1	57·2
Akyab	29·917	29·802	·115	29·857	+·024	·819	92·0	77·8	14·2	98·3	69·1	29·2	88·0	87·9	84·1	+1·4	71·1	77·8	78·2	75·7
Diamond Island	·919	·805	·116	·853	+·027	·829	89·5	75·1	14·3	91·5	72·1	19·4	85·7	85·6	80·6	−1·5	73·5	77·5	77·9	76·3
Rangoon	·887	·728	·160	·812	+·009	·789	100·6	75·8	24·8	104·0	73·2	30·8	88·2	94·8	85·7	+1·2	72·6	77·4	78·8	76·3
Mergui	·851	·731	·121	·783	+·015	·809	93·3	71·4	21·9	98·1	68 0	30·1	87·3	90·0	81·5	−0·3	69·7	78·7	79·7	76·0
Cocos Island	·850	·757	·093	·796	?	·840	91·4	74·1	17·3	95·1	71·8	23·3	87·5	87·6	81·0	?	73·8	78·1	78·2	76·7
Port Blair	·894	·791	·103	·835	+·034	·827	94·8	78·9	15·9	96·7	75·9	20·8	88·6	91·2	85·2	+1·5	75·5	80·6	81·6	79·3
Quetta	24·680	24·611	·069	24·638	+·052	?	72·0	45·3	26·7	81·5	32·4	49·1	65·4	69·7	58·1	−0·6	42·6	51·6	52·5	48·9
Leh	19·751	19·669	·082	19·716	+·040	?	54·5	29·9	24·6	60·8	21·4	39·4	45·3	50·0	42·4	−0·2	26·8	34·9	41·8	34·5
Katmandu			Imperfect			?	90·7	51·7	38·1	98·6	43·2	55·4	77·3	77·1	67·4	+1·0	48·6	60·7	61·1	56·8
Minicoy	29·964	29·866	·098	29·908	?	·843	90·6	82·8	7·9	93·2	75·4	17·8	87·8	88·1	86·0	?	77·2	80·4	80·6	79·4
Aden	·879	·751	·128	·815	+·018	·842	89·0	77·0	12·0	94·9	69·9	25·0	83·6	85·6	82·2	−0·5	70·9	75·5	74·1	73·5

* The hours of observations are 14 hours and 20 hours (in case of winds 12 hours and 24 hours) and the means

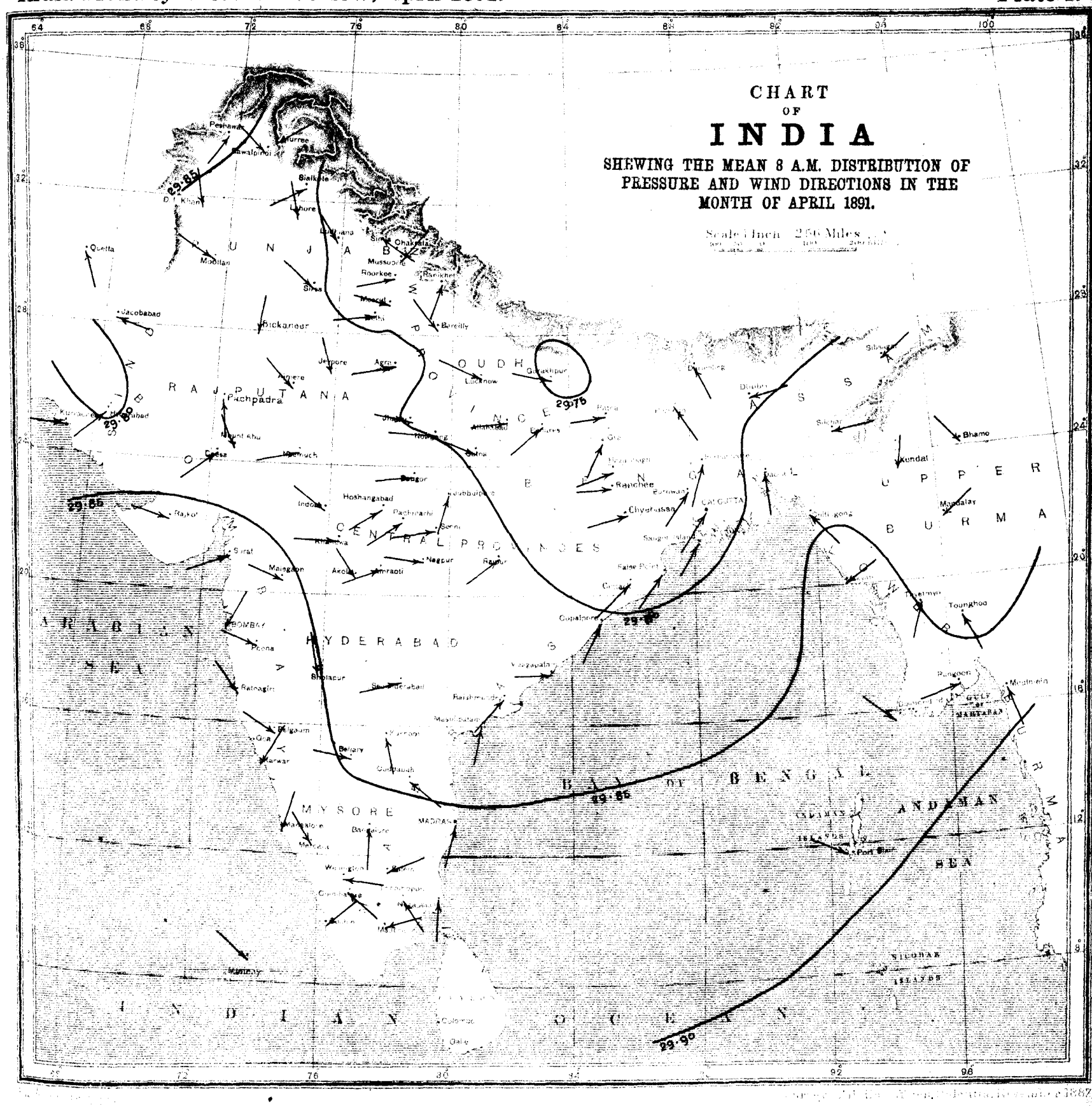
II —*concluded.*

in India, Burma, &c., in April 1891 —concluded.

Vapour Tension.					Humidity.					Cloud.				Wind Direction. Number of Winds from											Wind Steadiness.		Wind Velocity.		Station.
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 Mean.	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.	
·630	·723	·682	·678	—·039	90	67	56	71	—5	6·0	5·7	5·9	+0·7	26	2	6	9	...	6	5	4	2	S 66° E	S 86° E	14	21	32	83	Silchar.
·861	·925	·931	·906	+·015	91	71	73	78	—6	3·6	4·4	4·0	+0·9	...	...	...	...	3	47	7	3	...	S 6° W	S 38° W	91	79	346	332	False Point.
·792	·748	·638	·727	—·039	86	49	34	56	—6	2·3	3·6	3·0	+0·2	5	2	1	1	4	18	19	6	4	S 32° W	S 17° W	56	62	93	124	Cuttack.
·594	·582	·456	·544	—·002	69	40	24	44	+2	2·0	2·0	2·1	—0·1	...	10	3	...	...	...	22	12	13	N 81° W	S 80° W	58	40	85	65	Sambalpur.
·406	·413	·365	·395	—·019	47	26	19	31	—2	2·8	5·3	4·1	+1·8	3	3	5	1	1	1	17	20	9	S 89° W	N 88° W	55	35	173	148	Raipur.
·327	·430	·398	·385	+·039	37	26	19	27	0	1·3	3·1	2·2	+0·3	...	5	...	2	4	2	6	24	17	N 77° W	N 49° W	61	62	164	140	Khandwa.
·378	·437	·407	·408	+·072	44	27	20	30	+3	1·3	3·6	2·4	+0·2	1	1	3	4	1	6	23	18	3	S 59° W	S 89° W	57	32	122	69	Hoshangabad.
?	·280	·210	?	?	?	18	11	?	?	0·6	1·7	1·2	—0·2	...	2	3	2	5	6	16	18	8	S 68° W	N 73° W	49	47	95	90	Saugor.
·399	·365	·326	·364	+·035	55	24	17	32	+3	1·5	2·5	2·0	—0·1	5	2	4	2	8	6	4	20	9	S 80° W	N 66° W	32	32	87	82	Jubbulpore.
?	·251	·217	?	?	?	21	16	?	?	1·9	3·9	2·9	+0·8	1	...	...	5	1	7	20	18	8	S 63° W	N 58° W	60	47	147	128	Pachmarhi.
·437	·376	·373	·396	+·050	59	28	24	37	+7	2·5	4·2	3·4	—0·2	1	5	4	1	...	6	17	19	7	S 81° W	N 71° W	55	29	139	91	Seoni.
·374	·394	·359	·381	+·024	42	26	17	29	+2	1·6	4·3	3·0	0	...	8	3	2	4	11	8	11	13	S 89° W	N 63° W	32	20	166	127	Nagpur.
·533	·486	·438	·486	+·063	62	32	21	39	+7	2·1	3·6	2·9	+0·1	7	1	1	10	13	4	1	...	23	N 36° E	S 73° W	8	21	64	93	Chanda.
·553	·591	·462	·536	—·015	53	40	22	38	—2	2·2	4·3	3·3	+1·1	14	4	...	3	10	15	5	3	6	S 2° W	S 14° W	29	38	77	98	Sironcha.
·313	·307	·273	·283	+·008	40	27	20	25	—1	2·6	4·8	3·7	+1·5	9	15	1	1	2	6	2	6	18	N 41° W	N 42° W	43	50	199	193	Chikalda.
?	·281	·241	?	?	?	20	15	?	?	1·5	2·5	2·0	—0·4	13	15	1	...	2	2	1	5	21	N 35° W	N 31° W	54	55	173	217	Buldana.
·336	·338	·255	·312	+·028	40	22	12	22	0	1·7	3·7	2·7	+1·2	...	5	6	1	5	1	4	8	30	N 45° W	N 48° W	55	57	174	130	Akola.
...	...	...	...	...	...	Imperfect.			...	...	...	...	...	...	...	...	...	...	...	...	...	...	?	N 68° W	?	40	?	?	Makhla.
·425	·400	·254	·362	—·004	54	27	13	27	—1	3·2	4·3	3·8	+2·1	...	2	3	1	1	9	23	17	4	S 60° W	N 89° W	62	53	219	225	Deesa.
·736	·793	·797	·775	—·042	80	69	67	72	—3	2·1	1·5	1·8	—0·4	...	3	2	...	1	7	2	17	28	N 67° W	N 52° W	65	55	250	271	Bombay.
·374	·266	·262	·312	—·067	53	18	15	26	—4	1·9	3·6	2·8	+0·4	7	...	3	4	4	1	1	11	29	N 52° W	N 35° W	49	49	208	235	Poona.
·503	·465	·504	·504	+·134	56	28	24	36	+7	1·8	5·9	3·9	+0·6	...	9	5	8	5	2	6	15	10	N 49° W	N 18° E	25	14	201	203	Sholapur.
·730	·788	·817	·792	—·001	82	62	65	73	+3	0·9	0·8	0·9	+0·2	1	8	1	...	2	5	7	6	30	N 58° W	N 76° W	59	67	210	263	Ratnagiri.
·825	·825	·848	·844	+·018	86	66	65	73	0	1·2	1·6	1·4	—0·9	...	...	...	...	...	...	4	31	25	N 74° W	N 84° W	89	75	97	?	Karwar.
·518	·429	·510	·502	—·012	76	35	38	50	0	1·4	4·3	3·1	+0·5	...	7	6	6	1	2	5	10	4	N 35° W	S 88° W	23	25	?	314	Belgaum.
·580	·610	·593	·594	+·111	65	41	33	46	+8	2·6	5·6	4·1	+2·0	4	...	4	11	2	8	10	8	13	S 64° W	S 21° E	17	12	132	132	Secunderabad.
·681	·753	·846	·760	—·078	62	54	62	59	—8	2·3	3·9	3·1	+0·6	...	1	1	...	2	16	25	11	4	S 44° W	S 48° W	71	64	63	92	Vizagapatam.
·508	·610	·530	·549	+·078	54	40	27	40	+5	1·0	5·0	3·0	—0·2	44	2	...	4	1	3	...	2	4	N 8° W	S 37° W	2	11	131	127	Bellary
?	·871	·912	·891	+·027	?	62	82	77	+3	...	...	...	...	...	...	...	2	30	27	1	...	...	S 27° E	S 40° E	89	83	183	188	Madras.*
·815	·836	·693	·781	+·061	90	61	41	64	+6	3·0	4·4	3·7	+0·2	1	...	15	8	7	16	10	1	2	S 41° E	S 7° W	35	37	79	115	Salem.
·544	·590	·619	·584	—·004	89	67	67	74	+1	5·7	7·6	6·7	+1·4	...	8	1	4	...	...	...	18	29	N 49° W	N 70° W	75	45	45	83	Mercara.
·803	·738	·638	·726	+·001	86	51	35	57	+1	2·7	3·4	3·0	—1·5	1	2	6	11	25	7	3	1	4	S 57° E	S 50° E	53	18	93	98	Trichinopoly.
·831	·899	·909	·880	—·007	86	69	66	74	—3	2·8	3·5	3·1	—0·7	1	5	2	...	...	...	2	23	27	N 60° W	N 82° W	82	55	81	?	Cochin.
·368	·402	·420	·397	+·006	86	55	58	66	+3	3·9	5·6	4·8	+0·2	1	4	6	9	33	7	...	...	...	S 59° E	S 49° E	72	68	54	66	Wellington
·682	·823	·837	·781	—·035	70	63	64	66	—7	4·4	3·8	4·1	+1·1	...	6	1	2	4	21	9	13	4	S 39° W	S 75° W	44	40	64	98	Akyab.
·804	·832	·852	·829	—·032	92	68	69	76	0	3·0	2·6	2·8	—0·3	...	7	...	...	...	...	...	19	33	N 54° W	N 58° W	88	73	154	171	Diamond Island.
·761	·796	·771	·776	—·015	85	60	47	64	—3	1·5	2·2	1·9	—1·4	...	2	...	...	8	20	14	11	5	S 32° W	S 21° W	59	59	157	140	Rangoon.
·707	·866	·878	·817	—·063	92	67	62	74	5	3·4	4·8	4·1	—1·2	...	6	1	4	6	...	4	1	38	N 39° W	N 56° W	57	44	67	53	Mergui.
·830	·839	·840	·836	?	98	65	65	76	?	1·0	1·0	1·0	?	...	10	2	1	...	...	3	7	12	N 30 W	?	70	?	?	?	Cocos Island.
·841	·938	·952	·910	—·023	86	69	65	73	—5	2·7	3·4	3·1	—0·9	...	1	9	13	29	2	...	3	2	S 69° E	N 84° E	63	45	107	111	Port Blair.
·248	·229	·202	·226	—·029	80	37	29	49	—2	3·1	4·3	3·7	+0·3	22	1	...	2	3	4	5	12	11	S 87° W	N 81° W	51	36	106	106	Quetta.
·121	·115	·201	·146	+·041	73	38	56	56	+13	5·1	7·3	6·2	—0·1	3	5	4	3	3	7	17	15	3	S 62° W	S 54° W	40	19	41	73	Leh.
·315	·345	·356	·347	—·010	82	37	39	54	—5	3·3	4·1	3·7	—0·6	1	...	...	8	1	...	8	38	4	S 34° W	N 87° W	50	67	44	?	Katmandu.
·862	·941	·947	·917	?	77	71	71	73	?	3·3	3·7	3·5	?	...	3	6	6	3	2	5	18	14	N 64° W	?	37	?	159		Minicoy.
·678	·776	·692	·715	—·063	73	67	57	66	—4	3·6	0·8	2·2	—0·5	6	1	21	24	1	3	2	1	1	N 45° E	N 81° E	30	61	365	367	Aden

are as given in the registers sent by the Government Astronomer, Madras.

GOVERNMENT OF INDIA CENTRAL PRINTING OFFICE.—NO. 41 METEO.—3-9-91.—400.



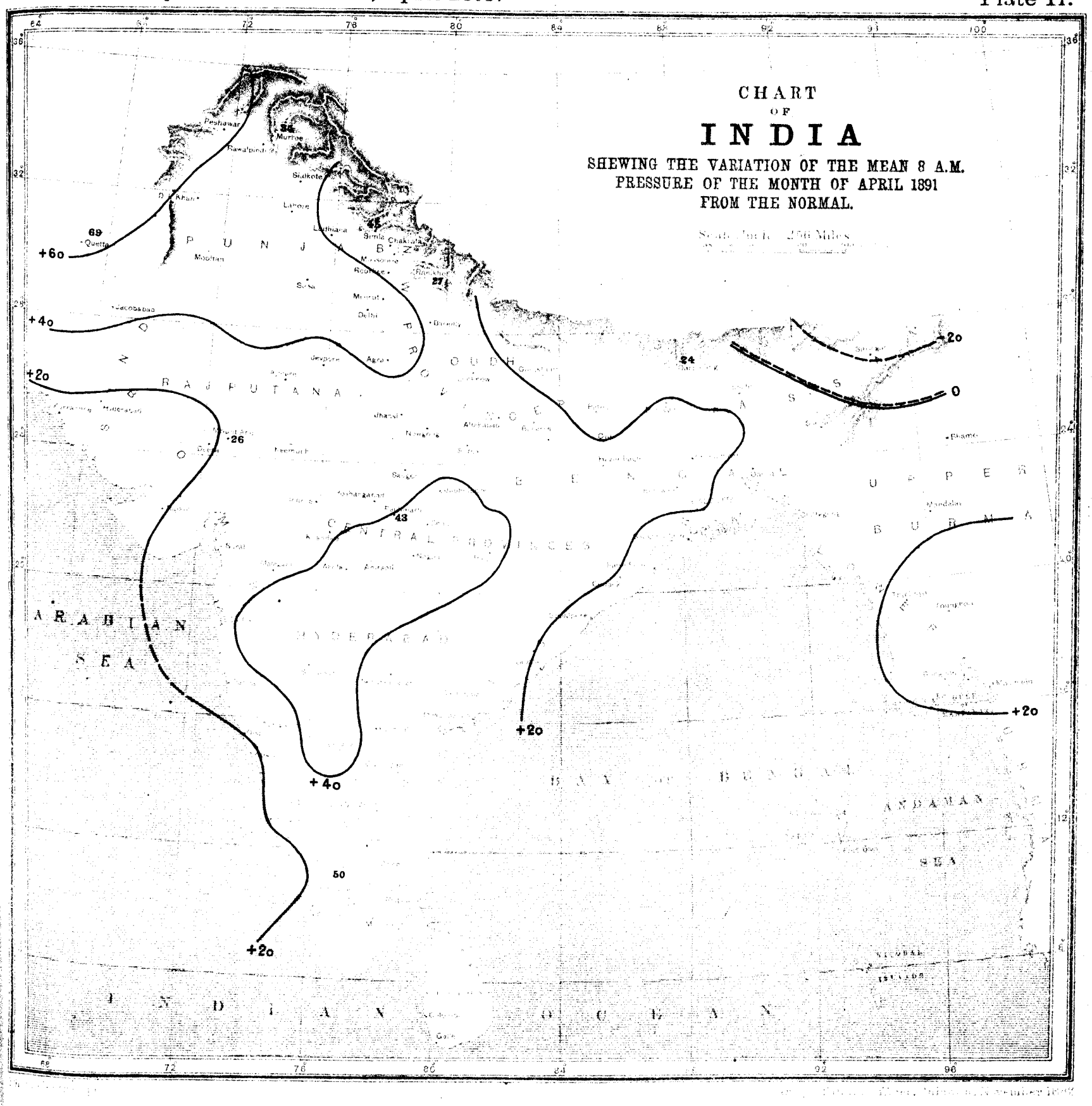
Explanation.

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 a difference 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 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.

Reg. No. 382, Wr., 1.—Sept. 91.—415.

Zinco., 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 variations (of two hundredths of an inch or ·020″). The numbers are given in thousandths of an inch, 20 representing ·020 or two hundredths, &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, represent the line of no variations, the dotted line facing the areas of deficient pressure or negative abnormals.

Reg. No. 382, Wr. & L.—Sept. 91.—415.

Zinco., S. I. O., Calcutta.

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

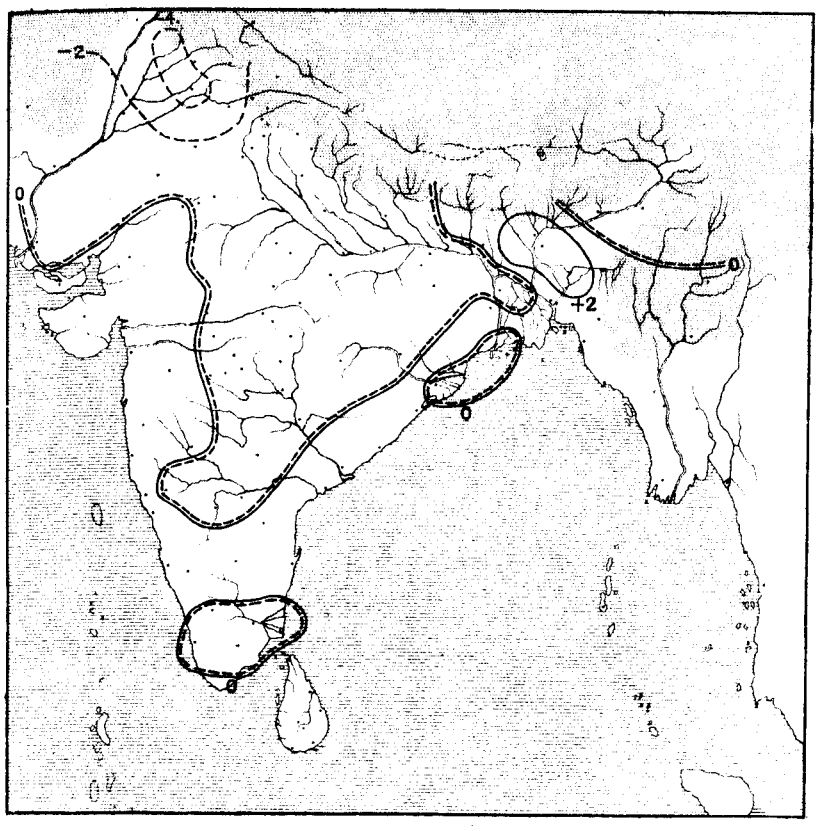
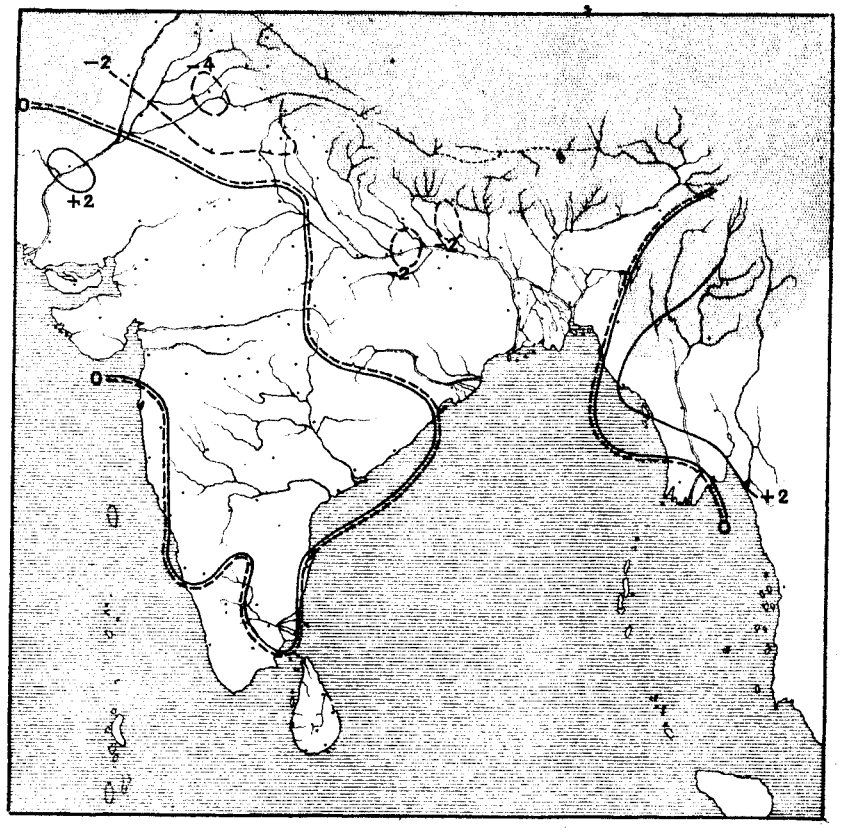


CHART SHEWING THE VARIATION OF THE MEAN MINIMUM TEMPERATURE OF THE MONTH FROM THE NORMAL.



Explanation.

Continuous lines indicate that the mean maximum of the month was in excess by the 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 the month was in excess by the 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.

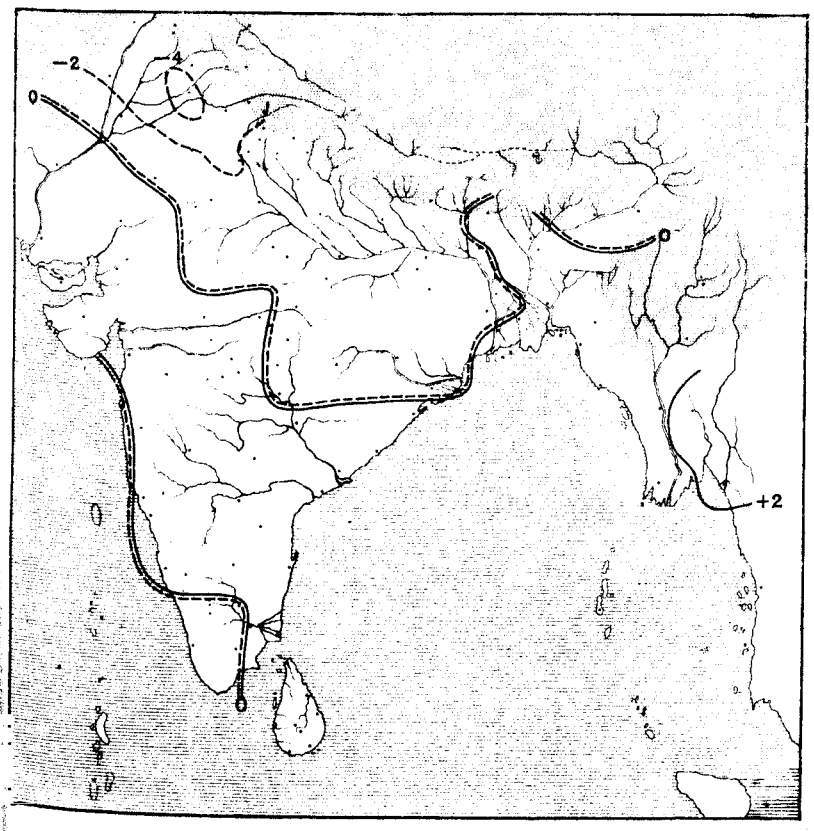
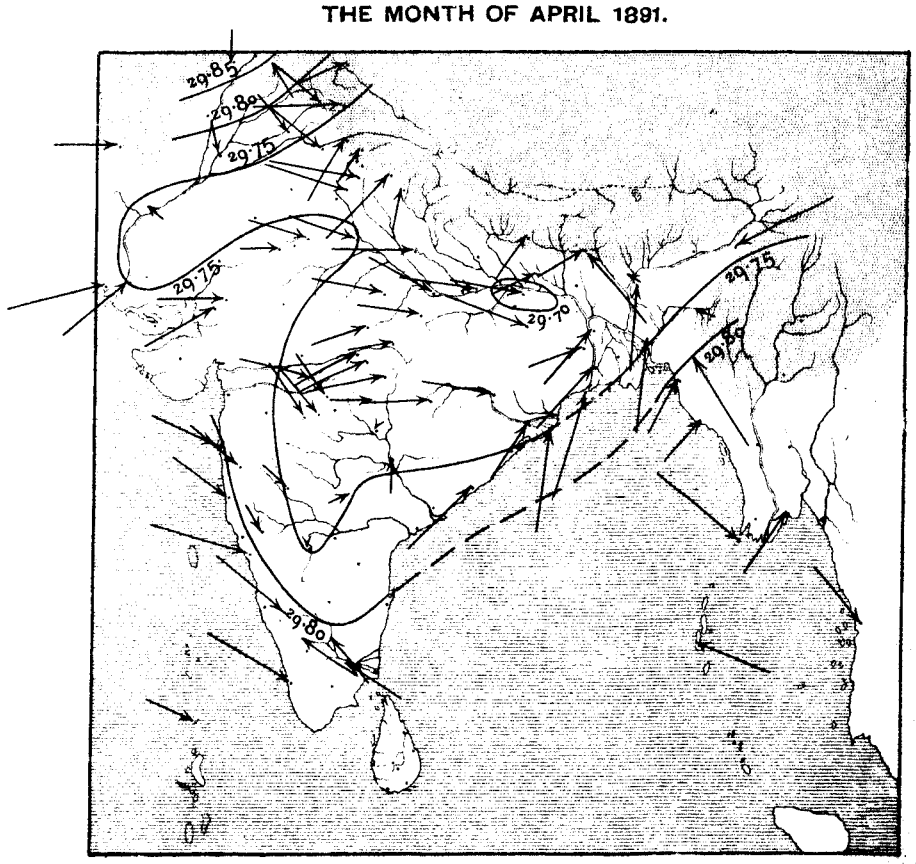


CHART SHEWING THE MEAN DISTRIBUTION OF PRESSURE AND THE RESULTANT WIND DIRECTIONS IN THE MONTH OF APRIL 1891.



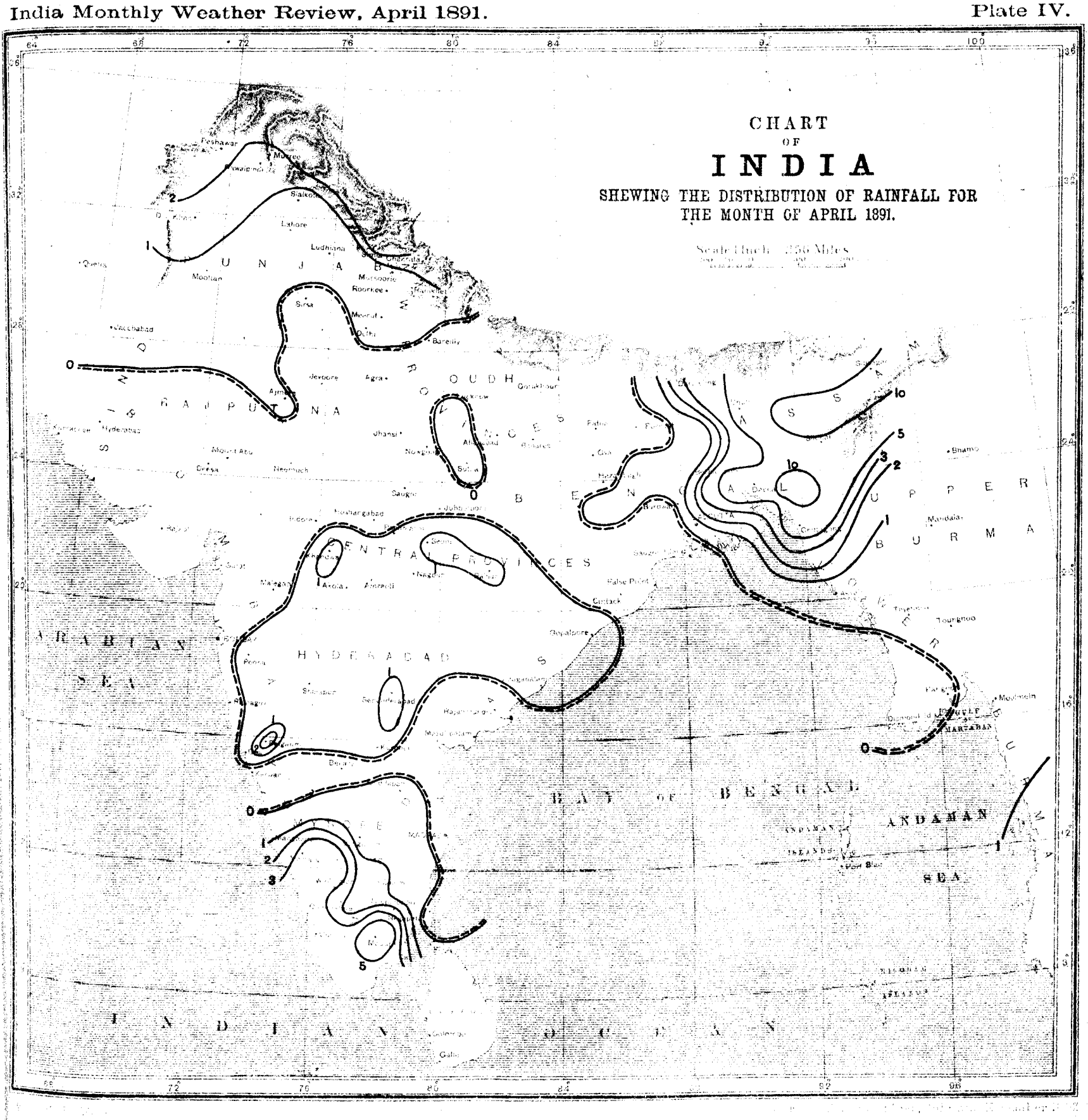
Explanation.

Continuous lines indicate that the mean daily temperature of the month was in excess by the 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 $\frac{5}{8}$th of an inch being equal to 100 per cent.

Reg. No. 560, Wr., L.—Aug. 91.—416.

Litho., S. I. O., Calcutta.

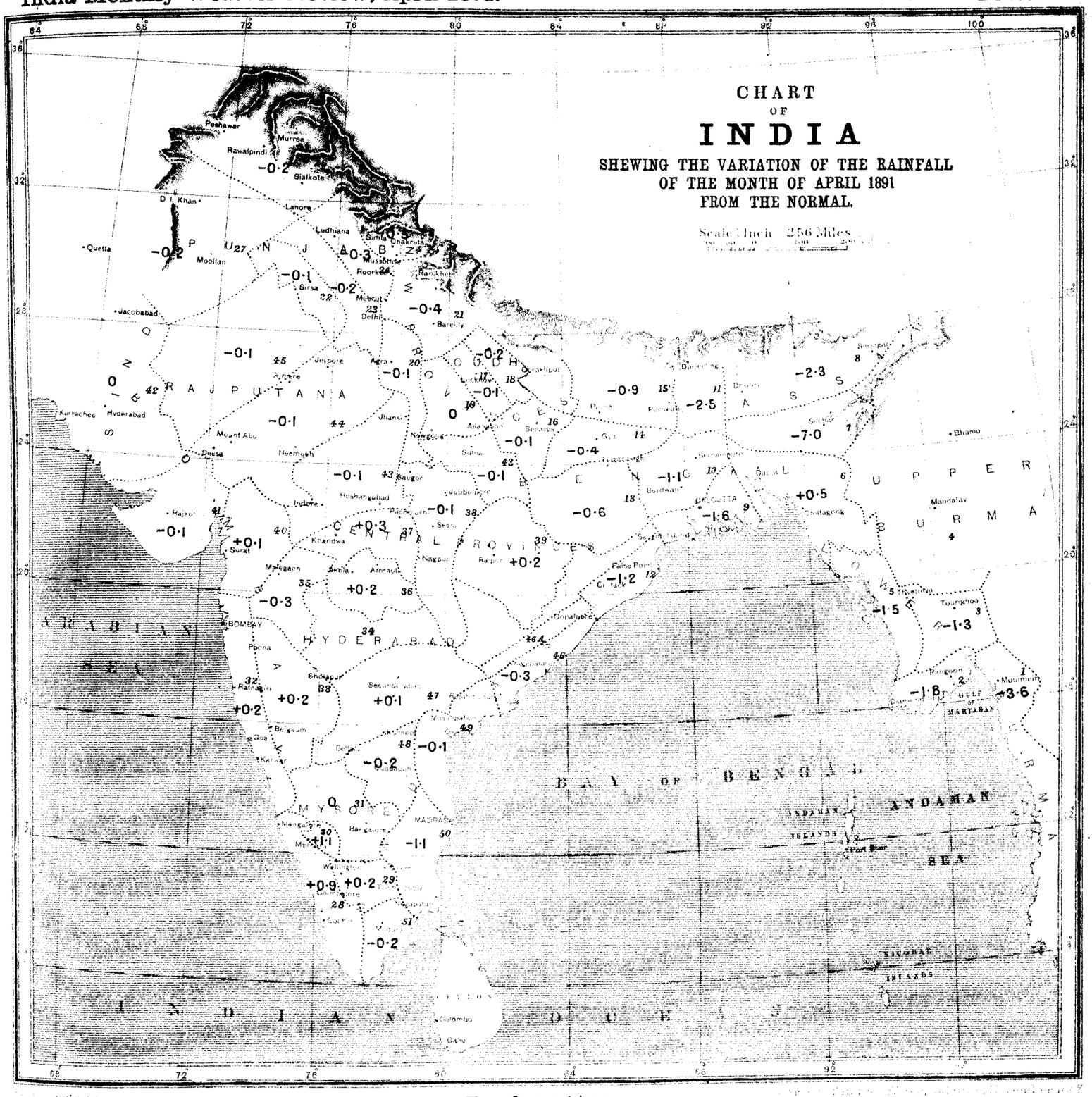


Explanation.

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. The double line or line of no rainfall separates areas in which the area 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. 862, Wr., I.—Sept. 91.—415.

Zinco. 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 51 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 name of the districts 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
3. Central do.
4. Upper do.
5. Arakan
6. Eastern Bengal
7. Assam (Surma)
8. Do. (Brahmaputra)
9. Deltaic Bengal
10. Central do.
11. North do.
12. Orissa
13. Chota Nagpore
14. Behar (South)
15. Do. (North)
16. North Western Provinces (East)
17. Oudh (South)
18. Do. (North)
19. North Western Provinces (Central)
20. Do. do. (West)
21. Do. do. (Submontane)
22. Punjab (South)
23. Do. (Central)
24. Do. (Submontane)
25. Do. (Hill Districts)
26. Do. (North West)
27. Punjab (West)
28. Malabar
29. Madras (South Central)
30. Coorg
31. Mysore
32. Konkan
33. Bombay Deccan
34. Hyderabad (North)
35. Khandeish
36. Berar
37. Central Provinces (West)
38. Do. (Central)
39. Do. (East)
40. Guzerat
41. Kattiawar
42. Sind
43. Central India (East)
44. Rajputana (East) Central India (West)
45. Rajputana (West))
46. East Coast (North)
46(a.) Do. do. (a)
47. Hyderabad (South)
48. Madras (Central)
49. East Coast (Central)
50. East Coast (South)
51. Madras (South)

Reg. No. 383, Wr., I.—Sept. 91.—415.

Zinco. S. I. O., Calcutta.

GOVERNMENT OF INDIA.

METEOROLOGICAL DEPARTMENT.

MONTHLY WEATHER REVIEW,

PUBLISHED BY ORDER OF

THE GOVERNMENT OF INDIA.

CALCUTTA, MAY, 1891.

INTRODUCTION.

THIS review of the weather in India during the month of May 1891 is based on observations taken at 8 A.M. daily at 158 stations and on additional observations taken at 10 A.M. and 4 P.M. at 89 stations. The rainfall summary is based on the rainfall data of the meteorological observatories and of the rainfall telegrams received during the month from District Officers throughout India. A summary of the snowfall reports received from District Officers, giving information of the weather and snowfall in the mountain districts to the North and North-West of India, is also given.

Summary of the chief features of the weather in India during the month of May 1891.

May is usually the last month of the hot-weather season in India, and completes the temperature and pressure conditions essential to the establishment of the south-west monsoon. The area of maximum temperature at the commencement of the month usually includes the Central Provinces, Berar and the eastern districts of the North-Western Provinces. As temperature in May generally increases more rapidly in North-Western India than elsewhere, the area of maximum temperature (or thermal focus as it has been termed) is usually transferred to Sind, the South-West Punjab and West Rajputana before the third week of the month. That area generally continues to be the area of maximum temperature in India during the rains, or until the third or fourth week of September. The maximum temperature of the year in India is usually observed in that area in the last week of May or the first week of June.

Pressure is usually slightly lower on the average in Northern than in Southern India at the commencement of the month. Pressure decreases rapidly in Upper India during the month, and the total range or difference of pressure between the equatorial belt and Upper India increases and establishes the baric gradients necessary for the extension of the south-east trade winds across the equator and their continuance northwards into India as the south-west monsoon winds.

This change takes place, it should be remembered, not by the concentration and intensification of the indraught to the hot area in Upper India, but by the advance of a vast mass of humid air impelled northwards by its own momentum and energy and by pressure *a tergo*.

Usually one or more advances of strongish humid winds, probably from the equatorial belt, occur in May and give moderate to heavy rain to Ceylon, Malabar and Tenasserim; but the great permanent advance which forms the setting in of the south-west monsoon does not generally commence until the end of May or beginning of June.

Over the whole of Western, Central and Northern India (with the exception of Bengal and Assam), the air in May is very dry, the temperature excessive, and the skies clouded with dust raised by the strong hot land winds which usually prevail during the day at this period. The

heat is occasionally mitigated for brief intervals by thunderstorms or duststorms. These hot-weather storms occur during periods of slight barometric disturbance, and occasionally give very heavy rain, chiefly in Assam and Bengal, and in and near the hills in Behar, the North-Western Provinces and the Punjab. Hence Assam and Bengal (more especially the northern and eastern districts) usually receive a large amount of rain, the average fall of the month in Bengal and Assam ranging from 4 inches in West Bengal to 52 inches at Cherra Poonji, and averaging 10 inches for the whole area.

The weather during the month of May 1891 was somewhat more disturbed than usual. Frequent showers of snow occurred during the month in the Western Himalayas, and added to the very great accumulation of snow of the previous five months. Temperature was below the normal at the commencement of the month over the whole Indian area, except Burma and Southern India. It increased rapidly in North-Western and Central India during the first week. Thundershowers were of frequent occurrence in North-Eastern India in the first half of that week, and in Southern India in the second half. A depression formed in Upper India on the 7th, which gave numerous storms with light rain in Upper India. This disappeared on the 9th, but weather continued more or less unsettled for some days in North-Eastern India, and numerous thunderstorms giving fairly general rain occurred daily in that area from the 9th to the 14th. A brief interval of fine, dry weather followed until the 18th, when the largest and most general disturbance of the month commenced. It practically affected the whole of India. In Upper India the disturbance was due to the formation of a deepish low pressure area in the Punjab on the 20th. It filled up on the 22nd, after having given numerous duststorms and thunderstorms to the Punjab and western districts of the North-Western Provinces. In North-Eastern India the disturbance commenced on the 17th, on which day the hot-weather depression in Chutia Nagpur intensified, and the local southerly winds at the head of the Bay increased considerably in force. During the next six days thunderstorms, attended with heavy rain, were of almost daily occurrence in every district of Bengal and Assam. One of these storms was a true tornado. It occurred at Sara, in North Bengal, on the evening of the 18th, overturned a railway train, and destroyed a number of houses and much property in the space of a few minutes.

The disturbance in Southern India and the Bay was due to a preliminary advance of humid winds. These began to give rain to Malabar and South Madras on the 18th. A small cyclonic whirl formed off the Coromandel Coast on the 19th and 20th, the indraught to which intensified the rainfall in Southern India for a short period. The whirl drifted slowly northwards, and carried the monsoon winds up the Bay. Port Blair had heavy rain on and from the 22nd, and Lower Burma from the 22nd and 23rd. These dates are hence the commencement of the south-west monsoon in these areas. The cyclonic whirl continued to advance northwards, but apparently filled up on the 23rd or 24th when approaching the Bengal and Orissa coasts. The southerly humid winds in its rear, however, continued to advance northwards, and passed into Bengal and the Gangetic Plain on the 24th and 25th. General rain fell over nearly the whole of Northern India on the 25th and 26th. This burst of rainfall was exceptionally heavy in Bengal, many stations receiving rainfalls of 5 inches and upwards. The most remarkable falls were 8·39 inches on the 26th at Darjeeling, and 16·40 inches on the 29th at Jowai in the Khasi Hills. This advance was, however, comparatively feeble, and the rainfall area rapidly contracted eastwards on the 26th. Bengal continued to receive moderate rain until the 28th or 29th, when fine weather set in for a brief period. Burma continued to receive steady rain from the 22nd to the end of the month. This general disturbance and rainfall caused a great reduction of temperature in Northern and Central India. The diminution of temperature was greatest on the 25th. The following table gives temperature variation data for two days, *viz*, the 18th and 25th, the former during the hottest period of the month, and the latter during the disturbed weather of the last ten days, for comparison :—

	18TH.			25TH.		
	VARIATION OF			VARIATION OF		
	Mean maximum temperature from normal.	Mean minimum temperature from normal.	Mean temperature from normal.	Mean maximum temperature from normal.	Mean minimum temperature from normal.	Mean temperature from normal.
Burma	+7·4	+3·6	+5·5	+4·5	+2·2	+3·4
Bengal and Assam	—0·8	+0·7	—0·1	—2·9	—1·3	—2·1
North-Western Provinces	+1·5	+1·6	+1·6	—14·6	—10·0	—12·3
Punjab	+2·3	+2·3	+2·3	—15·6	—8·4	—12·0
Bombay	+0·9	+1·2	+1·1	—0·5	—1·5	—1·0
Central Provinces	—0·1	+0·7	+0·3	—2·8	—3·7	—3·3
Guzerat and Central India	+0·2	+2·2	+1·2	—3·1	—3·0	—3·1
Sind and Rajputana	+0·4	+2·9	+1·7	—2·6	—5·4	—4·0
Madras	+0·9	+1·6	+1·3	—1·1	—1·3	—1·2

The variations of the mean maximum, mean minimum and mean daily temperature of the month were generally similar in character.

Temperature was more or less in defect in Northern India, the deficiency being greater in the day than in the night temperature. The following gives temperature data for this area of deficient temperature :—

DISTRICT.	VARIATION OF		
	Mean maximum temperature from the normal.	Mean minimum temperature from the normal.	Mean temperature from the normal.
Assam	—2·6	—1·1	—1·8
Bengal and Orissa	—1·0	—0·2	—0·6
Gangetic Plain and Chutia Nagpur	—0·7	—0·6	—0·7
Upper Sub-Himalayas	—2·4	—1·3	—1·9
Indus Valley	—2·1	—0·7	—1·4
East Rajputana	—0·7	0	—0·4

The preceding data show that temperature was most deficient in Assam and the Punjab. The deficiency was most marked at Sibsagar (—2·2°), Peshawar (—3·1°), Lahore (—3·2°) and Rawalpindi (—3·5). The deficient temperature in the Punjab was clearly a residual effect of the heavy snowfall in the mountain area to the north and north-west of the Punjab during the winter.

Temperature was in excess in the peninsula and Burma. The following gives data :—

DISTRICT.	VARIATION OF		
	Mean maximum temperature from the normal.	Mean minimum temperature from the normal.	Mean temperature from the normal.
Burma Coast and Bay Islands	+3·4	+1·6	+2·5
Burma Inland	+4·6	+0·7	+2·7
Deccan	+0·7	+0·6	+0·7
West Coast	+0·5	+0·3	+0·4
Southern India	+0·3	+1·1	+0·7

Temperature was hence slightly above the normal in the peninsula, and very considerably above it in Burma.

Temperature was more largely below the normal at the hill stations in Upper India than at the adjacent plain stations. The deficiency was greatest at Simla (—3·9°) and Murree (—3·7°).

Winds were steadier than usual over nearly the whole of India and Burma, and their mean directions varied little from the normal, except in the Bombay coast districts, Guzerat and West Rajputana, where the northerly element in the north-westerly winds of the period was abnormally strong. In the eastern districts of the North-Western Provinces, westerly winds of unusual strength prevailed during the month.

The variations of the amount of aqueous vapour from the normal were generally small, and hence the variations of the humidity were chiefly determined by the temperature conditions. Thus the air was considerably damper than usual in the area of most deficient temperature in North India (including the Punjab, Rajputana and the North-Western Provinces). It was, on the other hand, much drier in Burma, where temperature was considerably above the normal. There was a moderate deficiency in the amount of aqueous vapour in the air in Bombay, Berar, Guzerat and West Rajputana, where winds were more directly from the north than usual.

The amount of cloud was generally above the average in Northern India, and below it in Western and Southern India and in Burma.

The following table gives the mean variations of the aqueous vapour pressure, humidity, and amount of cloud from the normal in the large meteorological provinces of India:—

DIVISION.	MEAN VARIATION OF		
	Aqueous vapour pressure from normal.	Humidity from normal.	Cloud amount from normal.
Burma Coast and Bay Islands	—·009	—3	—0·9
Assam	—·013	+3	+1·0
Bengal and Orissa	+·005	0	+0·7
Gangetic Plain and Chutia Nagpur	—·020	+1	+0·5
Upper Sub-Himalayas	—·013	+2	+0·6
Indus Valley and North-West Rajputana	—·014	+1	+1·5
East Rajputana, Central India, and Guzerat	+·017	+2	+0·5
Deccan	+·009	0	+0·4
West Coast	—·021	—2	—1·1
Southern India	—·010	—1	+0·2
Hill stations	+·006	+2	+0·8

The rainfall of the month is usually due to two different sets of actions or conditions. In Northern and Central India it generally accompanies hot-weather storms, *i.e.*, thunder-storms, hailstorms, nor'-westers, duststorms, &c., which usually occur during periods of general disturbance. In Burma and Southern India it is due to temporary advances of southerly humid winds, or to the permanent advance of the south-west monsoon, which usually occurs in the fourth week of the month.

Weather was more disturbed than usual in Northern and Central India. The chief periods of general disturbance and of rainfall were from the 9th to the 13th, from the 17th to the 19th, and from the 21st to the 27th or 28th. During the second of these periods some storms of exceptional violence occurred in Bengal. During the last period a brief influx of south-west monsoon winds into Bengal gave heavy rain to Bengal, Behar and the eastern districts of the North-Western Provinces. In Bengal many stations received falls exceeding five inches on the 25th and 26th. The rainfall of the month over nearly the whole of Northern and Central India was hence more or less in excess. The following gives the variations for the larger provinces in the area of increased rainfall:—

PROVINCE.	Mean actual Rainfall for May, 1891.	Normal Rainfall for May.	Variation.
Assam	14·92	14·64	+0·28
Bengal and Orissa	10·72	6·88	+3·84
Gangetic Plain and Chutia Nagpur	3·28	2·11	+1·17
Upper Sub-Himalayas	0·88	1·11	—0·23
Indus Valley and North-West Rajputana	0·58	0·47	+0·11
East Rajputana, Central India and Guzerat	0·22	0·46	—0·24

In Southern India the temporary and partial advances of southerly winds were feebler and fewer than usual, and the permanent advance was considerably delayed. The latter commenced in Ceylon about the 19th. Shortly afterwards a cyclonic whirl formed off the Coromandel coast, the indraught to which increased the rainfall in Southern India.

It advanced northwards, and initiated the south-west monsoon at Port Blair on the 22nd, and in Lower Burma on the 22nd and 23rd. Rain fell daily in moderate amounts in these areas during the remainder of the month, and south-west winds obtained steadily over the southern half of the Bay. The whirl filled up near the head of the Bay on the 23rd or 24th, and little rain fell from the 23rd to the end of the month in Southern India; and there were no indications at the end of the month of an early advance of monsoon winds and heavy rainfall along the Malabar coast.

In consequence of the unusual delay in the establishment of the monsoon currents in Southern India, the rainfall in that area and also in Burma was considerably below the normal. The following table gives data:—

PROVINCE.	Actual Rainfall for May, 1891.	Normal Rainfall for May.	Variation.
Deccan	0·48	1·03	—0·55
West Coast	2·28	5·97	—3·69
South India	2·10	3·06	—0·96
Burma Coast	8·76	12·12	—3·36
Burma Inland	1·68	5·21	—3·53

Atmospheric Pressure.

The distribution of mean 8 A.M. pressure for May is shown by means of two charts. The first chart (Plate I) gives the distribution of the mean pressure of the month reduced to sea level and to constant gravity (that of Latitude 45°) by means of isobars drawn for differences of pressure of ·05″ or $\frac{1}{20}$th of an inch. The second chart (Plate II) gives the variations of the actual mean pressure from the normal pressure. These values are obtained from the barometric readings reduced for temperature only. A small chart No. 4 of Plate III gives the distribution of the monthly mean daily pressure and of the mean winds in the same form and manner as in the monthly charts given hitherto in annual reports on the meteorology of India. The data on which this chart is based are given in Table II. The more important barometric changes and movements during the month are fully given in the statement of the barometric depressions of the month.

The data that are chiefly used in this discussion are the 8 A.M. reduced observations and the variations derived from a comparison of these observations and the normal values given in Table I. The means in the third column are not only reduced or corrected to sea-level, but also to constant gravity. The normal means are obtained from the observations of the period 1878—88, and in order that the means and variations may be strictly comparable, the means have been calculated for observations of the same period in all cases.

The mean pressure of the Indian land area for the month of May was ·015″ above the normal. Excessive pressure has been a persistent feature of the meteorology of India for some time past as is shown by the following:—

MONTH.	Mean monthly anomaly.	MONTH.	Mean monthly anomaly.
October 1890	+·009	February 1891	+·022
November „	+·041	March „	+·015
December „	—·001	April „	+·028
January 1891	+·005	May „	+·015

Relatively to the general state, pressure was locally in excess (or the barometric anomalies were positive) in North-Western and Central India (*i.e.*, the area including Sind, the Punjab, Rajputana, North Bombay, Central India, the North Deccan, and western districts of the North-Western Provinces). The anomalies exceeded ·02″ in Sind and at the Punjab stations, and were greatest at the following stations in the Indus Valley:—

STATION.	Amount of positive anomaly.
Peshawar	+·050
Mooltan	+·040
Jacobabad	+·044

Pressure was relatively in defect over the remainder of India. The negative anomalies were small except for stations in Upper Assam and Southern India.

The following gives the largest anomalies in these two areas:—

DISTRICT.	STATION.	Amount of negative anomaly.
Assam	Sibsagar	—·032″
Southern India and West Coast	Karwar	—·027″
	Cochin	—·026
	Madura	—·030
	Negapatam	—·027
	Trichinopoly	—·028
	Salem	—·026
	Bangalore	—·025

These figures show that there was a marked contrast between the barometric conditions of North-Western and North-Eastern India and also between those of North-Western India and Southern India.

An important feature of the meteorology of the months May to October is indicated by the oscillations in the range of the pressure over India, which probably give an approximate view of the oscillations in the range of pressure between the equatorial belt to the south of the Bay of

Bengal and Arabian Sea and the area of minimum pressure in the Indian monsoon region.

The following give the larger variations in the range of pressure in May 1891 :—

DATE.	HIGHEST PRESSURE.		LOWEST PRESSURE.		Range of pressure or total gradient.
	Station.	Amount.	Station.	Amount.	
1st May	Tavoy	29·934	Roorkee	29·761	·173
7th ,,	Tavoy	29·931	Khushab	29·619	·312
13th ,,	Tavoy	29·829	Patna	29·034	·195
	Colombo	29·784			
22nd ,,	Tavoy	29·801	Montgomery	29·441	·360
	Colombo	29·712			
28th May	Tavoy	29·865	Sirsa	29·585	·280
	Colombo	29·845			
31st ,,	Colombo	29·847	Sirsa / Ludhiana	29·478	·369
	Tavoy	29·831			

Hence the range of pressure oscillated during the month between the values 17″ and ·37″. The larger fluctuations, which only are shown in the preceding statement, occurred on the average at intervals of seven days. The data also show clearly the tendency for the range of pressure to increase in amount during the month.

Depressions and periods of disturbance during the month.

At the commencement of the month pressure was highest in the south-east of the Bay and Tenasserim and lowest at the foot of the hills from Purneah to Sialkot. Weather was slightly disturbed with frequent thunderstorms in Bengal, Assam, and Upper Burma. On the 4th the area of minimum pressure covered North Behar, and settled weather set in for a brief period in North-Eastern India, whilst it became disturbed in the peninsula, with light thundershowers.

A low-pressure area formed in Upper India on the 7th, the centre of which was between Montgomery and Mooltan. Duststorms, in some cases attended with light rain, occurred in the North and West Punjab and Upper Sind on the afternoon and evening of the 7th and of the 8th. Pressure increased rapidly on the 7th in Upper India. The changes of pressure on the 8th brought the Chutia Nagpur depression into prominence. Bengal, Behar and Assam were visited with numerous thunderstorms on the 9th and 10th. The depression shifted slightly to the west on the 13th and 14th, and the weather was very unsettled with numerous severe thunderstorms and nor'-westers on these days in Assam, Bengal and Behar.

A local rise of the barometer in the Gangetic Plain partially filled up this depression on the 15th, and the distribution of pressure was approximately normal on the 16th, a shallow trough of low pressure running north-westwards from Orissa to the Punjab.

A period of very disturbed weather now followed. This was in part due to the development of the Chutia Nagpur area of low pressure on the 18th, 19th, and 20th in part to the formation and existence of an area of low pressure in the South-Eastern Punjab on the 19th, 20th, 21st and 22nd, and in part to the formation and northward advance of a low pressure area in the Bay from the 19th to the 24th.

The Punjab low-pressure area appeared on the 20th. Pressure decreased an eighth of an inch during the next 24 hours, and the centre of the depression was near Montgomery at 8 A.M. of the 21st. A further smaller fall of about ·06″ took place in this area during the day, and on the morning of the 22nd pressure was 29·44″ at Montgomery and two-tenths of an inch lower than at Kurrachee. Very strong westerly winds prevailed on the Sind and Cutch coasts, and numerous duststorms and thunderstorms visited Upper India on the 21st and 22nd. The depression filled up during the day, but the weather continued to be disturbed, with numerous local storms, in Upper India during the next three days.

During the whole of this period the pressure conditions in North-Eastern India were favourable to the continuance of strong southerly winds, which were continued as easterly winds in Behar and the eastern districts of the North-Western Provinces. This, as already stated, was mainly due to the intensification of the Chutia Nagpur low pressure area. Frequent and severe thunderstorms hence occurred during this period from the 19th to the 23rd in Assam, Bengal, Behar, and the eastern districts of the North-Western Provinces.

The most important depression of the month was that which originated in the Bay off the Coromandel Coast on the 18th and 19th. The following gives a brief account of it, chiefly based on the marine observations collected from ships entering the port of Calcutta :—

Depression of the 19th to the 27th.—The weather was squally off the Malabar Coast on the 17th and 18th. It was also very squally with strong winds in the extreme south of the Bay. The ship *Malda*, in latitude 5° 30′ N., longitude 88° 17′ E., at noon of the 17th had squally stormy weather, with very heavy rain and winds, ranging in force during the day from 3 to 8. The ship *Sheila*, in latitude 2° 10′ N., longitude 84° 22′ E., at the same hour had hard squalls increasing in severity. The squally weather appears to have extended north as far as latitude 9½° N. on the 17th, and as shown by the logs of a large number of vessels, winds were very variable in direction and force during the day in the area of squally weather in the Bay.

Light to moderate north-easterly breezes prevailed in the centre of the Bay, and south-westerly winds, force 4, at the head of the Bay. Again, on the 18th the logs of the *Monmouth*, *Goorkha*, *Khyber*, *Quetta*, *Landaura* and other vessels show that weather was squally with heavy rain over the Bay to the south of latitude 10½° N., and that a very shallow depression lay off the north and north-east coasts of Ceylon. The winds in that area were very light with frequent calms, and there was no indication of the establishment of a cyclonic circulation. On the 19th, the depression was slightly more pronounced, and lay between the Coromandel Coast and the 84° meridian. Squally weather had extended north as far as latitude 14° N., but winds were light and variable in the intervals between the squalls. Strong winds were advancing northwards up the east of the Bay. The observations of the morning of the 20th show that a fairly well defined depression was now established off the Coromandel Coast, the centre of which was probably in about latitude 10° N. and longitude 82° E. Winds were increasing in strength, and the squalls were more frequent and severe, but the squally weather had apparently, so far as can be judged from the observations, not extended beyond latitude 14° N.

The storm concentrated and intensified to a moderate extent during the next 24 hours. The following gives the noon observations of the 21st on board the vessels nearest the centre :—

Ship.	Position.		Barometer.		Wind.	Weather.
	Latitude, North.	Longitude, East.	Reduced to 32° and to Latitude 45° gravity.	Approximate variation from normal.		
	° ′	° ′				
Utrica .	12 15	83 9	?	?	E.	Moderate, stormy appearance to S. E.
Clan Mackenzie.	10 3	81 31	29·534	—·16	W.	Strong breeze. Heavy rain. Squalls.
Hartfield .	8 50	82 12	·615	—·10	W.S.W.	Moderate gale with rain. Squalls.

They indicate that the centre was in about latitude 11½° N. and longitude 82½° E., and that although the winds had increased considerably in force, they were by no means violent. In fact, two of the three vessels had occasional calms and light winds during the afternoon. The squally weather had advanced to latitude 16° or 17° in the east of the Bay, but had not extended beyond latitude 14° N., in the west of the Bay.

The depression advanced slowly northwards during the day, but did not develop at all. The centre was probably in latitude 12½° N. and longitude 83° E., at noon of the 22nd. The logs of vessels in that area during the day show that weather was squally with much rain; and that winds were cyclonic in direction, but varied in force from light airs and calms in the western quadrant to a moderate gale in the south-east quadrant.

The centre advanced to about latitude 14° N. and longitude 83½° E. at noon of the 23rd. The storm was unchanged in character, and had not intensified. The chief feature, as hitherto, was the irregularity of the winds in the storm area. Strong south-west winds had advanced up the Bay as far as latitude 17° or 18° N., and the monsoon was setting in over Lower Burma. On the 24th squally monsoon winds were experienced as far north as latitude 20° N. in the east of the Bay. The depression had continued to drift northwards at about the same rate as hitherto, and the centre was now in about latitude 15½° N. and longitude 84° E. Squally weather, with intervals of light to moderate winds, prevailed, as hitherto, in the area, and the strongest winds were experienced in the east and south-east of the Bay. The centre advanced to latitude 17° N. and longitude 84½° E. at 8 A.M. of the 25th. The log of the *Fairfax*, which advanced northwards through the eastern quadrant during the day, and was at a distance of 100 miles to the west of the centre about noon, illustrates the character of the weather in the depression very clearly.

Hour.	Wind direction.	Weather.
4 A.M. .	S. W. by S.	Moderate breeze and overcast.
8 A.M. .	S. W. by S.	Moderate wind and fine. Sky cloudy. Very heavy rain at 11 A.M.
Noon .	N. W.	Moderate breeze. Strong squalls, with torrents of rain.
4 P.M. .	N. W.	Moderate wind and cloudy.
8 P.M. .	Calm.	Calm and southerly.
Midnight .	W.	Light wind and cloudy.

Similar variable winds were experienced in the western quadrant by the S.S. *Scindia*. Squally weather with strong winds prevailed over the north-east and east of the Bay. During the next 48 hours it continued to drift slowly northwards as an ill-defined, diffused depression, and filled up rapidly on the evening of the 27th. There was no trace of its existence in the morning of the 28th, when south-west monsoon winds were established over the Bay, and general rain had commenced to fall in Bengal and Orissa.

The depression never passed beyond the early stages of cyclonic formation. Squally weather, with intervals of unsteady winds, prevailed in the depressive area. It advanced northwards, whilst a moderate strong burst of monsoon winds was pressing up the east of the Bay. The barometer appears never to have fallen below 29·5″ in the area of depression, and was nowhere more than ·2″ or ·25″

below the normal of the period. The following gives the positions of the centre at 8 A.M. from the 20th to 25th :—

Date.	Hour.	Latitude, North.	Longitude, East.	Distance travelled in past 24 hours.	Rate per hour.
				Miles.	Miles.
20th . .	8 A. M.	10°	82°		
21st . .	,,	11½°	82½°	105	4·4
22nd . .	,,	12½°	83°	80	3·3
23rd . .	,,	14°	83½°	105	4·4
24th . .	8 A.M.	15½°	84°	105	4·4
25th . .	,,	17°	84½°	105	4·4

Steepish gradients obtained in the Bay during the remainder of the month, and the accompanying south-west winds continued to give moderate rain to Burma and Bengal.

Summary of the Reports of the Weather and Snowfall in the mountain districts to the north and north-west of India.

The following gives a summary of the information received respecting the snowfall of the month of May :—

I.—Afghan Mountain Districts.

No information has been received for these areas for the month of May, and it is probable that no snow has fallen.

II.—The Punjab and Kashmir Himalayas.

(*a*) *Lahoul.*—The Reverend Mr. Heyde, Superintendent of the Kailang Observatory, in his letter of the 23rd May, writes—"The passes by which communication is kept open with Kulu were twice closed after the despatch of my previous letter. They are usually open for the season from the middle of March, but this year they were passable for the first time in the second week of April. They were closed again from the 21st of April to the 8th of May, in consequence of heavy snowfall, and again from the 10th to the 20th of May, on which day the second dâk of this season was sent across. Snow, however, began to fall again on the 21st, and fell steadily for over 48 hours. This fall probably added at least 5 feet of snow to the past winter's accumulation on the higher mountains."

(*b*) *Kulu.*—The quantity of snow on the mountains was considerably reduced during the month of May, although the thunderstorms which characterize that month in Kulu were of more frequent occurrence than usual, and attended with falls of snow down to an elevation of 10,000 feet. The Rotang pass was open for foot traffic during the month. The Hamta pass still continues closed,—the first time for many years that it has not been open before the beginning of June.

The following is the reported depth of the snow on the 25th of the month on the chief passes in the Kulu and Plach Districts :—

Kulu District.

Name of Pass.	Height.	Depth of snow at end of May		
		1891.	1890.	1889.
	Feet.	Feet.	Feet.	Feet.
Rotang	13,000	9	5	10
Hamta	14,500	12	6	7
Chandar Khani	?	8	½	4
Barsai	?	5	1	*Nil*
Bujadhur	?	2	3	*Nil*
Lori Achri	?	*Nil*	*Nil*	1
Bushtari	?	*Nil*	*Nil*	*Nil*
Bhubhu	10,000	*Nil*	*Nil*	1
Majang	?	*Nil*	*Nil*	*Nil*
Plach District.				
Chul	?	*Nil*	*Nil*	*Nil*
Sirikand	15,000	32	12	50
Maghian	?	1	*Nil*	*Nil*
Tikkar	?	1	...	...
Dundku	?	2	1½	1
Ramgarh	?	...	...	...
Nunu	?	*Nil*	*Nil*	*Nil*
Jalori	10,500	1	*Nil*	*Nil*
Raghopur	?	2	*Nil*	*Nil*
Himri	?	1	*Nil*	?
Sakiran	?	*Nil*	*Nil*	*Nil*
Suphakun	?	4	1	4
Gargarasan	17,000	4	2	3
Bashleo	11,000	1	*Nil*	*Nil*
Plach	?	2	1	2
Tirath	?	2	1	4

(c) *Upper Sutlej Valley.*—The Deputy Conservator of Forests, Bushahir Division, wrote on the 16th May that the valley of the Baspa was blocked by snow, and that it was not possible to launch any timber at that time, and hence that a much smaller quantity of timber would be sent down this year than usual. In his second letter, dated the 31st May, from Sungri, he writes—"I have just returned from the Upper Sutlej Valley. None of the passes into Thibet, Spiti, Garhwal, or the Paber Valley are open yet, and there is an unusual quantity of snow in the slopes above 10,000 feet. On the north and north-east slopes the snow is 5 to 6 feet in depth at 10,000 feet, and it is said to be as much as 20 feet deep in the valleys below the Barenda, Rupin, Bakch and Sholarung passes. In the Baspa Valley the torrent beds are full of snow, from 15 to 20 feet deep, and in the Burna Khud below the Barenda pass the snow extends down to 7,000 feet, and there is a snow bridge across the Baspa at that elevation. The villagers say that the snowfall has been the heaviest they remember. From the 3rd to the 10th of May snow fell every day as low down as 9,500 feet, and this has delayed the melting of the snow considerably."

Summary of Special Storm Reports.

The following gives a statement of the chief local storms of which reports were received during the month. The month witnessed a series of storms of unusual violence. These storms were of the ordinary hot-weather type, *viz.*:—thunderstorms, hailstorms or tornadoes in Bengal, North-Western Provinces, and the Deccan, and duststorms in the Punjab and the driest and hottest parts of the country:—

1st May.—Very severe thunderstorm at Pedong from 5-30 to 8-30 P.M., during which 6·32 inches of rain fell.

The following interesting account of the storm was sent by the Revd. A. Desgodins, S. J., who records observations voluntarily for the department:—"The area of this storm seems to have included Sikkim, English and Native, and English Bhutan. The storm ascended the Teesta Valley, perhaps from the plains, but more likely from the lower spurs overhanging the plains, and went to north and north-east, passing on its way over the Damsong and Pedong ridge, and falling straight over the Pedong valley, where for nearly three hours it turned constantly as in a small circle, wind and cloud changing constantly their direction. At last the storm disappeared to the east and south-east, where it must have gone to the plains, for, after clearing here, lightning was to be seen in that direction. The chief features of the storm were:— 1st, the barometer did not fall either before or during the storm, though it is the most violent we have had for the last ten years; 2nd, the very large fall of rain,—in fact, it is the first time that we have had over six inches of rainfall within my experience; 3rd, the frequent change of direction of wind and clouds; it looked as if we were in the centre of the storm."

Thunderstorm at Sibsagar from north-north-west, lasted from 7-20 P.M. to 8-8 P.M.

3rd May.—Violent hailstorm at Jessore from north lasted from 5-6 to 5-36 P.M.

Duststorm at Sutna from north-west, and lasted from 5-45 to 6-20 P.M.; strongest winds 60 miles per hour.

6th May.—Duststorm at Burdwan from 5-30 to 6 P.M.

7th May.—Duststorm at Lahore from 4-50 to 5-30 P.M.

Severe duststorm at Khushab from 3 P.M. to 3-30 P.M.

8th May.—Duststorm at Bareilly, lasted two hours, and did some damage to trees.

9th May.—Duststorm at Allahabad from 2 A.M. to 5 A.M.

Violent hailstorm at Dhubri from north-west at 6-30 P.M.

Nor'-wester at Burdwan from 5 to 5-40 P.M.

Very severe duststorms at Neemuch (5 P.M.), Nusseerabad and Mandsaur. The duststorm at Neemuch came from west-south-west.

Duststorm at Hyderabad (Sind), from 4-30 to 5-30 P.M.; average wind velocity reported to be 82 miles per hour.

10th May.—Severe thunderstorm at Kishnaghur at 7 P.M.

11th May.—Duststorm at Ajmere, lasted from 2 to 2-30 P.M.

Thunderstorm at Dhubri from 8 to 9 P.M.

12th May.—Severe nor'-wester at Gopalpore from 3-45 to 4-5 P.M.

Duststorm at Hyderabad (Sind), from 3-25 to 5-25 P.M.; average wind velocity 59 miles per hour.

Thunderstorm at Bareilly, greatest velocity of wind 36 miles per hour.

Thunderstorm at Lahore at 2 P.M., with hail and rain.

Duststorm at Ludhiana, 3-15 to 3-45 P.M.; came up from south.

Thunderstorm at Poona from 3 P.M. to 4-45 P.M.

13th May.—Duststorm at Allahabad at 5 P.M., came from north.

Thunderstorm at Burdwan from 5-45 to 6-15 P.M., with very strong winds, which blew down houses and trees. Average velocity of wind during the storm 40 miles per hour.

Duststorm at Hazaribagh from north-west at 4 P.M.

14th May.—Duststorm at Khandwa at 4-15 P. M.

Very severe hailstorm at Poona from 5-25 to 5-55 P. M.

Violent duststorm at Jacobabad at 3-50 P. M. from north-north-west. Average force of wind during the period of 25 minutes the storm lasted was 56 miles per hour.

16th May—Severe nor'-wester at Berhampore, with hail and rain, at 4-30 P. M.

Thunderstorm at Burdwan, in which 1·1 inch of rain fell in 20 minutes. The barometer fell from 29·770 at 4 P. M. to 29·686 at 5 P. M., then rose to 29·762 at 5-20 P. M. and fell to 29·714 at 5-28 P. M. The large rise of the barometer from 5 P.M. to 5-20 P.M. occurred during the approach of the storm. The storm came down rapidly from north, with a very strong gust of wind and thick dust, at 5·15 P.M.

Severe thunderstorm with hail at Ranikhet from 1-20 to 2 P. M.

17th May.—Severe thunderstorm at Sibsagar at 7 P.M.

18th May.—Severe thunderstorm at Allahabad.

Tornado at Sara, in North Bengal. The following account of this storm is taken from the *Pioneer* newspaper:—"Greatd amage was done by a violent storm at Sara on the night of 18th June. Between thirty and forty carriages of the Darjeeling mail which were waiting the arrival of the steamer were overturned on the line. The railway locomotive sheds were wrecked, and much injury was done to rolling-stock. The craft in the river suffered severely, but no loss of life is reported. The roofs of two of the ferry-steamers were blown bodily away. Over two hundred dwelling houses were levelled to the ground, and in many cases the inmates sustained serious injuries. The iron roof of the station house was rolled up like paper; trees were uprooted, and the telegraph wires in many places blown down. Telegraphic communication with Calcutta and Northern Bengal was entirely interrupted for some time afterwards. Fortunately the extreme force of the wind lasted only a few minutes or the damage must have been far more serious."

Duststorm with rain at Peshawar from 4 P.M. to 4-55 P.M.; strongest winds blew at the rate of 44 miles an hour.

Severe nor'-wester at Jessore from 8-25 P.M. to 9 P.M.

Severe thunderstorm at Kishnaghur from 7-30 to 7-50 P.M.

19th May.—Severe thunderstorm at Ranikhet at 5-30 P.M.; strongest winds 44 miles per hour.

20th May.—Severe thunderstorm at Bareilly from 8-45 to 9-20 P.M.; strongest winds 72 miles per hour.

Violent duststorm at Sirsa, came from south-west and lasted from 6 to 8 P.M.

21st May.—Violent duststorm at Neemuch from south-west; lasted from 11 P.M. to 1 A.M.

Duststorm at Hyderabad (Sind) from 3-30 to 4-20 P.M.; average velocity 68 miles per hour.

Violent duststorm at Hazaribagh from south-west at 4 P.M.

22nd May.—Thunderstorm at Bareilly from 7-30 P.M. to 8 P.M.

Nor'-wester at Berhampore from 5 to 5-30 P.M.; average wind velocity 30 miles per hour.

Violent storm from south-west at Nyadoomka from 8-10 to 8·25 P.M.

Thunderstorm at Ranikhet from 2-30 P.M. to 11 P.M.

Duststorm at Lahore from 2-55 to 4-40 P.M.

23rd May.—Violent duststorm at Agra at 2-30 P.M., which came from south-west.

Duststorm at Allahabad at 6-30 P.M. The barometer rose from 29·480 at 6 P.M. to 29·574 at 6-45 P.M.

Thunderstorm at Ludhiana at 3 P.M.

Severe thunderstorm at Sutna from 2-30 to 2-45 P.M. Hailstones weighing upwards of 8 ounces are stated to have

fallen in the neighbouring village of Narohill.

Duststorm at Lahore from 4 to 5-20 P.M.

24th May.—Thunderstorm at Cawnpore from 1 P.M. to 3 P.M.

Squally weather, with very high sea, at the island of Minicoy, off the Malabar Coast.

25th May.—Duststorm at Sutna from west at 6-40 P.M.

28th May.—Duststorm at Ranikhet from 1 to 2 P.M.; strongest winds 44 miles per hour.

Temperature of the Air.

The distribution of temperature in India for May 1891 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 data by means of which these charts have been prepared are given in Table I. The normal mean maximum and minimum temperatures have been obtained for each station from the observations of the same number of years, *viz.*, 1878 to 1888. 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 amounts, which vary from month to month. But the variation of the mean daily temperature from the normal, as determined by the use of this definition, agrees in almost all cases very closely with the variation as determined by the use of true daily means based on readings at 16 hours, in addition to those 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.

The chief features of the variations of the temperature of the month from the normal were similar in character to those of the preceding month, but were smaller in amount. They hence indicate the presence of the abnormal conditions due to excessive snow accumulation in the mountain area to the north and north-west of Upper India.

The mean maximum or day temperature was in defect over the whole of Northern India and the greater part of Central India and the Central Provinces. The deficiency was less than 2° over the greater part of this area. It exceeded 2° in North Bengal and Assam and the Punjab and Upper Sind, and 4° in the North Punjab. The following give the largest variations :—

District.	Station.	Amount of deficiency.
Punjab	Quetta	—3·8
	Murree	—4·0
	Rawalpindi	—5·0
	Peshawar	—4·8
	Lahore	—3·4
North Bengal and Assam	Dhubri	—3·7
	Sibsagar	—3·3
	Dinajepur	—2·9
	Bogra	—3·7

It was in excess over the whole of the remainder of the country, but the excess was small except in Burma and the West Deccan and Mysore. The largest positive variations are given below :—

District.	Station.	Amount of excess.
Burma	Tounghoo	+5·4
	Moulmein	+4·9
	Thyetmyo	+4·6
	Bassein	+4·2
Guzerat	Surat	+2·8
West Deccan and Mysore	Bangalore	+3·0
	Poona	+2·8

Maximum temperatures exceeding 110° were registered in the Circars, Central Deccan, Berar, the Central Provinces, Central India, Rajputana, Sind, the North-Western Provinces and Punjab.

The following gives the highest maximum temperatures registered at stations in these provinces where maximum temperatures exceeding 110° were observed at any time during the month :—

District.	Station.	Highest maximum temperature registered during the month.
		°
Madras	Rajahmundry	112·1
	Masulipatam	110·7
	Nellore	110·3
Bombay	Sholapur	110·2
Berar	Akola	111·6
	Amraoti	113·9
Central Provinces	Nagpur	114·9
	Khandwa	111·7
	Hoshangabad	111·6
	Jubbulpore	110·0
	Saugor	110·4
	Raipur	110·7

DISTRICT.	Station.	Highest maximum temperature registered during the month.
		°
Central India	Nowgong	111·6
	Sutna	111·1
	Neemuch	110·1
Rajputana	Pachpudra	114·5
	Deesa	113·5
	Bikaneer	112·9
	Jeypore	111·3
North-Western Provinces	Agra	114·5
	Jhansi	113·5
	Allahabad	110·4
	Lucknow	110·3
Sind	Jacobabad	119·0
	Hyderabad	117·2
Punjab	Montgomery	115·9
	Sirsa	114·4
	Khushab	112·0
	Dera Ismail Khan	111·5
	Mooltan	113·3

The highest day temperatures were hence registered in Sind, but they were several degrees lower than the highest temperatures occasionally observed in that area in May. The highest temperatures were generally registered in North-Western India on the 31st.

The mean minimum or night temperature was in slight defect in Northern India and in excess in the Peninsula and Burma. The variations exceeded 2° in three small areas :—

AREA.	Station.	Amount of excess.
		°
1st.—Burma	Moulmein	+3·9
	Akyab	+3·4
	Tounghoo	+3·1
2nd.—Southern India	Salem	+4·0
	Trichinopoly	+2·7
	Madura	+2·5
	Bangalore	+2·1
3rd.—Berar and Central Provinces	Amraoti	+2·8
	Khandwa	+2·3

The mean temperature of the month was below the normal in Northern India, and above it in the Peninsula and Burma. The deficiency in Northern India was most marked in the Punjab and Assam. The following gives data :—

DISTRICT.	Station.	Amount of deficiency.
		°
Punjab	Lahore	—3·2
	Rawalpindi	—3·5
	Peshawar	—3·1
Assam	Sibsagar	—2·2
	Dhubri	—2·6

Temperature was most excessive in Lower Burma, more especially at the following stations :—

DISTRICT.	Station.	Amount of excess.
		°
Burma	Moulmein	+4·4
	Tounghoo	+4·3
	Bassein	+2·5

and at Salem and Bangalore in Southern India.

The following gives a brief statement of the larger temperature changes during the month. These changes were almost entirely due to the occurrence of rainfall. In periods of fine cloudless weather during the hot season the temperature increases rapidly up to a limiting temperature, about which it fluctuates. If disturbed weather with rain follows, temperature falls with great rapidity (from 10° to 25° or 30°), and remains low during the rainfall period. The reduction of temperature occurs chiefly in the day temperature. The disturbed weather usually lasts for two or three days, and is followed by another interval of fine clear weather and rapidly increasing temperature.

In consequence of the occurrence of rainfall in the last week of April, temperature was considerably below the normal on the 1st of May, over the whole of India, except Burma and Southern India. The following give the variations on that day :—

DISTRICT.	VARIATION OF		
	Mean maximum temperature from the normal.	Mean minimum temperature from the normal.	Mean temperature from the normal.
Burma	+2·8	+2·2	+2·5
Bengal and Assam	—0·5	—2·4	—1·5
North-Western Provinces	—6·3	—5·5	—5·9
Punjab	—8·3	—4·7	—6·5
Bombay	+1·0	—0·8	+0·1
Central Provinces	—2·3	—0·9	—1·6
Guzerat and Central India	—3·2	—0·8	—2·0
Sind and Rajputana	—2·1	—3·1	—2·6
Madras	—0·1	+1·0	+0·5

Temperature increased rapidly on the 2nd and 3rd over the whole of India, except the Punjab, where showers were received at this period. From the 3rd to the 8th temperature increased steadily, the area of greatest excess of temperature at this time including West Bengal, South Behar and Chutia Nagpur. The character of the distribution of temperature on the 8th is shown by the following variation data :—

DISTRICT.	VARIATION OF		
	Mean maximum temperature from the normal.	Mean minimum temperature from the normal.	Mean temperature from the normal.
Burma	+3·1	+2·1	+2·6
Bengal and Assam	+1·6	+2·5	+2·1
North-Western Provinces	+4·6	+3·3	+4·0
Punjab	+0·7	+1·4	+1·1
Bombay	+0·9	—1·5	—0·3
Central Provinces	—0·4	—1·6	—1·0
Guzerat and Central India	—1·2	+0·9	—0·2
Sind and Rajputana	—1·8	+0·3	—0·8
Madras	+0·5	+2·2	+1·4

A rapid fall of temperature followed during the next 24 hours in Upper India due to light but fairly general rain in the Punjab and western districts of the North-Western Provinces and in Bengal. This disturbed period continued until the 14th. The chief features of the distribution of

temperature during this period are shown by the following average variation data for the 14th :—

District.	Variation of		
	Mean maximum temperature from the normal.	Mean minimum temperature from the normal.	Mean temperature from the normal.
Burma	+4·2	+1·1	+2·7
Bengal and Assam	+1·1	—1·5	—0·2
North-Western Provinces	+0·5	—2·8	—1·2
Punjab	—7·5	—3·0	—5·3
Bombay	+2·9	+1·4	+2·2
Central Provinces	+1·5	+0·7	+1·1
Guzerat and Central India	+0·7	—0·2	+0·3
Sind and Rajputana	—1·0	—0·1	—0·6
Madras	+0·7	+2·1	+1·4

Temperature increased steadily from the 14th to the 19th in all districts except Bengal and Assam, where frequent thunderstorms occurred and kept down temperature

On the 19th, the mean temperature of the day was upwards of 8° above the normal in Central Burma, and upwards of 6° above in thegreater part of the South-West Punjab and Upper Sind and at Salem in Southern India. Disturbed weather, with frequent heavy thundershowers, continued in North-Eastern India, and rain began to fall in Southern India, due to an early advance of monsoon winds and the formation of a small cyclonic whirl off the Coromande Coast. The following give the temperature variations of the 20th at the commencement of this period of disturbed weather :—

District.	Variation of		
	Mean maximum temperature from the normal.	Mean minimum temperature from the normal.	Mean temperature from the normal.
Burma	+8·2	+2·9	+5·6
Bengal and Assam	—4·9	—2·6	—3·8
North-Western Provinces	+2·7	+2·5	+2·6
Punjab	+2·1	+5·1	+3·6
Bombay	+2·6	+1·7	+2·2
Central Provinces	+2·0	+4·3	+3·2
Guzerat and Central India	+2·0	+2·8	+2·4
Sind and Rajputana	+2·2	+1·1	+1·7
Madras	—0·1	+1·7	+0·8

The chief feature of the first three weeks of the month as of the previous three or four months, was the excessive temperature in Burma.

The weather became more and more disturbed during the next four or five days, and thunderstorms or duststorms occurred over nearly the whole of India. Very heavy rain was received in North-Eastern India on the 25th and 26th, and general rain over the whole of Northern and Central India, apparently due to an influx of moist winds from the Bay of Bengal brought up by a feeble cyclonic whirl which advanced slowly northwards during the fourth week of the month off the west coast of the Bay.

The effect of rainfall in diminishing temperature in the hot weather is strikingly shown by the following variation data for the 25th :—

District.	Variation of		
	Mean maximum temperature from the normal.	Mean minimum temperature from the normal.	Mean temperature from the normal.
Burma	+4·5	+2·2	+3·4
Bengal and Assam	—2·9	—1·3	—2·1
North-Western Provinces	—14·6	—10·0	—12·3
Punjab	—15·6	—8·4	—12·0
Bombay	—0·5	—1·5	—1·0
Central Provinces	—2·8	—3·7	—3·3
Guzerat and Central India	—3·1	—3·0	—3·1
Sind and Rajputana	—2·6	—5·4	—4·0
Madras	—1·1	—1·3	—1·2

The mean temperature at Ludhiana and Delhi on the 25th was upwards of 18° below the normal.

The rainfall area in Northern India contracted rapidly eastwards during the last four days of the month, and at the end of the month the weather was fine and dry over the whole of India except Bengal and Burma where light thundershowers continued to be received. Hence a rapid increase of temperature took place during this period, and at the end of the month temperature was above the normal over the whole of India except Burma and Bengal where it was slightly in defect. The following table gives variation data for the 31st :—

District.	Variation of		
	Mean maximum temperature from the normal.	Mean minimum temperature from the normal.	Mean temperature from the normal.
Burma	—0·1	—2·5	—1·3
Bengal and Assam	—2·1	+0·4	—0·9
North-Western Provinces	+3·2	—1·4	+0·9
Punjab	+3·4	—2·0	+0·7
Bombay	+2·0	+0·8	+1·4
Central Provinces	+5·4	+2·9	+4·2
Guzerat and Central India	+3·1	+0·7	+1·9
Sind and Rajputana	+2·7	+4·0	+3·4
Madras	+4·1	+2·8	+3·5

Winds

The mean wind direction at 8 A.M. during the month is shown in Plate I by arrows flying with the wind. It is obtained by the use of Lambert's formula, in which equal value is given to every wind point. The data are given in Table I. The mean wind directions derived from the wind observations at 10 A.M. and 4 P.M. are given in the small chart, No. 4 of Plate III, by means of arrows flying with the wind. The data for these will be found in Table II, together with the normal directions obtained from the observations of the past 10 to 20 years.

May is the last month of the hot weather over the greater part of India, and is a period of transition over a part of the Indian area, *i.e.*, Southern India and the south of the Bay of Bengal and Arabian Sea, in which south-west monsoon winds are usually initiated before the end of the month. Westerly winds obtain over the greater part of the Gangetic Plain, and easterly winds in the Assam Valley. Strong southerly winds (with more or less westing) blow across the Bengal coast, and are continued as south-easterly and easterly winds in Central Bengal and North Behar. In Western and Central India and the Deccan winds range between north-west and west, whilst on the Coromandel Coast south-east winds generally obtain.

Winds in May 1891 were much steadier than usual in the Punjab, the North-Western Provinces and Behar, and were on the whole slightly stronger, as is shown by the following data:—

Station.	Steadiness.		Velocity.	
	Average, May 1891.	Normal, May.	Average daily air movement, May 1891.	Normal daily air movement, May.
Lahore	42	21	67	78
Roorkee	45	6	76	88
Allahabad	36	20	114	96
Patna	62	38	154	115

The westerly element of the wind was much stronger than usual, more especially at Lahore and Allahabad, at each of which station the mean wind direction of the month was N. 33° W., the normal being N. 7° E. and N. 8° E., respectively.

Winds were also much steadier in Bengal, Lower Assam and Orissa, and were stronger and less westerly than usual at the coast stations of Saugor Island and False Point. In the interior the variations of the wind direction from the normal were small and somewhat irregular.

The normal cyclonic circulation obtained in Sind over the Sind hot-weather depression; winds being south-westerly at Kurrachee and south-easterly at Jacobabad, but they were rather weaker than usual.

In West Rajputana, Kathiawar, and the Bombay coast districts very steady north-west winds obtained, the northerly element being more strongly pronounced than usual The following data illustrate this important abnormal feature:—

Station.	Direction.		Steadiness.	
	Average direction, May, 1891.	Normal direction, May.	Average, May, 1891.	Normal May.
Mount Abu	N. 87° W.	S. 62° W.	71	70
Deesa	N. 29° W.	S. 55° W.	48	76
Bombay	N. 70° W.	N. 82° W.	83	67
Ratnagiri	N. 34° W.	N. 73° W.	84	64
Karwar	N. 59° W.	N. 69° W.	89	81

Winds were also steadier and more northerly than usual in Berar. In the Central Provinces, the variations were somewhat irregular, but on the whole winds were less steady and more westerly than usual.

The influence of the Burma area of deficient pressure and excessive temperature was shown by the undue northing of the winds at Diamond Island, and probably also at Mergui. Winds were on the whole steadier, more especially at Rangoon and Mergui. Winds were normal in strength and steadiness at Port Blair, but there was an undue predominance of easterly winds, probably due to the south-west monsoon not commencing to influence the winds in the south-east of the Bay until the fourth week of the month. The mean wind direction of the month at that station was S. 30° E., the normal being S. 34° W.

Humidity and Cloud.

The hygrometric data for 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 the minimum of the 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 *Vade-Mecum*, which are 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 5 to 20 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 computed, are the means for periods varying from 5 to 25 years of the available cloud data for the same hours.

The air contained slightly more vapour on the average than usual at the hill stations and in the Punjab, and was much damper in consequence of the diminished temperature. Thus at Peshawar the humidity was 9 in excess and at Murree 8. Skies were more clouded, the excess in the cloud amount ranging from 0·5 at Mooltan to 1·6 at Peshawar. The humidity conditions differed little from the normal in the North-Western Provinces, and there was somewhat more cloud than usual.

The conditions were reversed in Behar, where the average cloud amount was in slight defect, and the air damper than usual. Chutia Nagpur was very dry, the humidity being 9 in defect. There was, however, a considerable ex-

cess of cloud (+1·7). In Bengal and Assam the humidity conditions varied little from the normal, but there was much more cloud than usual, more especially at Dhubri (+2·1) and Saugor Island (+1·2).

The air was considerably drier, and the skies generally less clouded during the month in West Rajputana, Kathiawar, the Bombay coast districts, the West Deccan, and Berar, in which area north-west winds of unusual steadiness and with a strongly marked northerly element prevailed. The following gives the variation data for representative stations in that area :—

Station.	Variation of		
	Average aqueous vapour pressure for May, 1891, from the normal.	Average humidity for May, 1891, from the normal.	Average cloud amount for May, 1891, from the normal.
Deesa	—·094	—4	+0·9
Poona	—·062	—2	+0·2
Belgaum	—·035	—3	—0·1
Akola	—·047	—4	+2·5
Buldana	—·104	—9	—0·2
Bombay	—·029	—1	—1·3
Karwar	+·008	—2	—1·5

The variations of the humidity conditions and amount of cloud were small and irregular in the Central Provinces and Madras. There was somewhat less aqueous vapour present in the air at the Burma stations, and in consequence of the excessive temperature the humidity was considerably below the normal. The cloud amount was also more or less below the average. The same conditions extended over the greater part of the south-east of the Bay, as indicated by the Port Blair observations.

The following data illustrate these features :—

Station.	Variation of		
	Aqueous vapour pressure from the normal.	Humidity from the normal.	Cloud amount from the normal.
Port Blair	+·002	—5	—0·4
Rangoon	—·018	—7	—2·4
Mergui	—·019	—6	—0·6
Akyab	+·004	—4	—0·4

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 offices of the Meteorological Reporter, Director of Land Records, or other officer 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 May 1891 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.

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 160 meteorological stations. The distribution of rainfall is shewn on this chart by means of isohyetic lines, or lines of equal amounts of rainfall, the numbers attached to each line indicating the rainfall.

Over a considerable portion of the country no rain fell. The line of no rainfall is indicated by two parallel lines separated by a short distance, one continuous and the other dotted, the latter facing the districts of no rainfall.

The second chart illustrating the distribution of the rainfall of the month is given in Plate V, and shows by figures the variation of the mean actual rainfall of the month from the normal rainfall in each of the 51 meteorological districts into which India and Burma have been divided for purposes of comparing crops, rainfall, &c. The data of this chart are deduced from the rainfall information telegraphed by district officers, of which a summary is given in the following table, and the actual figures utilized are those given in the last column. The numbers given in the centre of each district are the variations of the actual mean rainfall of the district from the normal mean rainfall; a number given in a corner of each district in small slanting figures serves as an index by means of which, on referring to the list of districts at the foot of the chart, the name of the district can be at once ascertained.

Province.	Division.	Average actual rainfall of division. 1st and 2nd May.	3rd to 9th.	10th to 16th.	17th to 23rd.	24th to 30th.	31st May.	Average Total rainfall, May, 1891.	Normal average rainfall, May.	Variation from normal.
		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Burma	Tenasserim	0	0	0·95	0·32	7·70	0·98	9·95	20·98	—11·03
	Lower Burma	0	0	0	0·60	4·11	0·52	5·23	12·01	—6·78
	Central do.	0·01	0·04	0·39	0·15	1·96	0·34	2·89	9·07	—6·18
	Upper do.	0·05	0·16	0·17	0·25	0·74	0·31	1·68	?	?
	Arakan	0·06	1·70	0·95	1·49	6·30	0·62	11·12	20·63	—9·51
Bengal and Assam.	Eastern Bengal	0·85	1·26	2·88	6·17	2·41	0·48	14·05	11·60	+2·45
	Assam (Surma)	0·92	3·65	3·78	9·19	8·56	1·02	27·12	23·47	+3·65
	Do. (Brahmaputra)	0·84	2·66	1·53	3·84	2·09	0·19	11·75	11·83	—0·08
	Deltaic Bengal	0·40	0·62	1·51	2·75	3·15	0·37	8·80	6·52	+2·28
	Central do.	0·17	0·33	1·63	2·41	4·99	0·31	9·84	5·34	+4·50
	North do.	0·33	1·64	2·60	3·83	5·14	0·17	13·71	11·67	+2·04
	Orissa	0·05	0·44	0·42	0·69	3·11	0·10	4·81	4·00	+0·81
	Chutia Nagpur	0·01	0	0·56	1·10	3·46	0·25	5·38	3·08	+2·30
	Behar (South)	0	0	0	0·30	2·62	0·50	3·42	1·84	+1·58
	Do. (North)	0·04	0·06	0·88	1·02	2·81	0·63	5·44	2·86	+2·58
North-Western Provinces and Oudh.	North-Western Provinces (East)	0·01	0	0	0·12	0·45	0·10	0·68	0·66	+0·02
	Oudh (South)	0	0	0	0·45	0·55	0·02	1·02	0·64	+0·38
	Do. (North)	0·01	0·01	0	0·13	2·16	0·09	2·40	1·08	+1·32
	North-Western Provinces (Central)	0·01	0·02	0·01	0·08	0·74	0·01	0·87	0·49	+0·38
	Do. do. (West)	0·01	0·31	0·32	0·06	0·46	0	1·16	0·52	+0·64
	Do. do. (Submontane)	0·02	0·04	0·04	0·26	0·56	0·27	1·19	1·38	—0·19
Punjab	Punjab (South)	0·06	0	0·15	0·01	0·26	0	0·48	0·59	—0·11
	Do. (Central)	0·03	0·17	0·13	0·05	0·86	0	1·24	0·65	+0·59
	Do. (Submontane)	0·10	0·01	0·10	0·16	0·19	0·03	0·59	0·86	—0·27
	Do. (Hill Districts)	0·37	0·20	0·05	0·79	1·44	0	2·85	3·12	—0·27
	Do. (North-West)	0·19	0·26	0·23	0·28	0·03	0	0·99	1·13	—0·14
	Do. (West)	0·08	0·13	0·22	0·09	0·05	0	0·57	0·50	+0·07
Bombay and Malabar Coast Districts (Madras).	Malabar	0·32	1·61	0·63	3·78	2·58	1·05	9·97	13·52	—3·55
	Madras (South Central)	0·26	0·41	0·17	1·59	0·01	0·20	2·64	3·62	—0·98
	Coorg	0·57	1·42	1·42	1·48	0·13	0·36	4·38	8·96	—4·58
	Mysore	0·14	0·34	0·62	0·75	0·03	0·21	2·09	?	?
	Konkan	0·02	0·05	0·11	0·14	0·07	0·01	0·40	3·18	—2·78
	Bombay Deccan	0·01	0·18	0·74	0·28	0·16	0·05	1·42	2·21	—0·79
	Hyderabad (North)	...	...	...	...	...	...	...	...	...
	Khandeish	0	0	0·04	0	0	0	0·04	1·77	—1·73
Central Provinces and Berar.	Berar	0	0·01	0·08	0	0	0·01	0·10	0·99	—0·89
	Central Provinces (West)	0·05	0·01	0·04	0·02	0·01	0·03	0·16	0·88	—0·72
	Do. (Central)	0·02	0·01	0·11	0·06	0·56	0·14	0·90	0·79	+0·11
	Do. (East)	0·20	0·31	0·20	0·52	1·88	0·08	3·19	1·21	+1·98
Bombay (North).	Guzerat	0	0	0	0	0	0	0	0·42	—0·42
	Kathiawar	0·01	0·03	0	0	0	0	0·04	0·28	—0·24
	Sind	0·05	0·07	0·05	0·13	0	0	0·30	0·13	+0·17
Rajputana and Central India.	Central India (East)	0·01	0·01	0	0·01	0·06	0·01	0·10	0·84	—0·74
	Rajputana (East), Central India (West)	0·01	0	0·33	0·16	0·01	0·02	0·53	0·88	—0·35
	Rajputana (West)	0	0	0	0·38	0	0	0·38	0·68	—0·30
Madras	East Coast (North)	0·06	0·05	0·26	0·52	2·23	0·11	3·23	3·51	—0·28
	Do. (do) (a)	0·05	0·35	0·40	1·46	0	0·17	2·43	?	?
	Hyderabad (South)	0·01	0·03	0·53	0·30	0	0·01	0·88	1·59	—0·71
	Madras (Central)	0·09	0·14	0·06	0·19	0·16	0·03	0·67	2·53	—1·86
	East Coast (Central)	0·02	0·39	0	0	0·20	0·02	0·63	1·80	—1·17
	Do. do. (South)	0·01	0	0	1·41	0·11	0·08	1·61	2·24	—0·63
	Madras (South)	0·09	0·12	0·19	1·26	0·02	0·04	1·72	2·47	—0·75

The rainfall of the month occurred almost entirely in connection with the disturbances described in the pressure section.

At the commencement of the month dry weather prevailed over the whole of India except East Bengal and Assam, where light to moderate thunderstorms occurred on the 1st and 2nd. Local thundershowers were received in parts of the Deccan and Malabar on the 3rd and 4th, and in Assam, Bengal and Malabar on the 5th and 6th. A shallow depression formed in the Punjab on the 7th, and moderate rain was received on the 8th and 9th in the hill districts of the Punjab and the western districts of the North-Western Provinces. Dry weather obtained from the 9th to the 14th over the whole of India except Bengal and Assam, where numerous thunderstorms continued to occur and gave fairly general rain. From the 14th to the 18th dry weather obtained generally. Local storms gave some showers in Upper India, the Central Provinces, Bengal and Assam, but they were of little importance.

Weather was more or less disturbed from the 19th to the 27th. This was chiefly due to a preliminary advance of south-west monsoon winds from the equatorial belt northwards. These winds gave fairly general rain in Southern India on the 19th and 20th, and initiated a small cyclonic whirl off the South Coromandel Coast, which drifted slowly northwards. The indraught to this whirl continued to give moderate rain to Southern India on the 21st, 22nd, and 23rd, and moderate rain to the Carnatic on the same days. Daily rain was received in Bengal and Assam from thunderstorms during the whole of this period, and a depression, which formed in Upper India on the 21st and 22nd, gave moderate showers in the East Punjab and western districts of the North-Western Provinces and the hill districts.

The cyclonic whirl as it advanced up the Bay, although it did not intensify, carried the humid current of the south-west monsoon northwards. Port Blair received its first fall on the 22nd, and Burma on the 22nd and 23rd. The humid current reached the head of the Bay on the 24th, and extended rapidly over Bengal and the Gangetic Plain. It gave a general burst of rain on the 25th and 26th over the whole of that area. The rainfall was exceptionally heavy and general in Bengal and some very heavy falls were received in Bengal on the 25th and 26th. The following are the most noteworthy :—

District.	Station.	Date.	Rainfall.
			Inches.
Mymensingh	Dewanganj	26th	7·66
Cooch Behar	Matabhanga	,,	5·75
Darjeeling	Darjeeling	,,	8·39
	Kurseong	,,	7·70
Bankoora	Indas	,,	6·13
	Maliara	,,	5·06
	Sonamukhi	,,	5·11
Beerbhoom	Hetampore	26th	5·20
Burdwan	Mankur	,,	5·00
Julpigoree	Alipore Doar	,,	5·00
Purneah	Gondwara	25th	5·90
Monghyr	Monghyr	,,	5·14
	Gogri	,,	5·52

The humid current fell off rapidly in strength on the 26th, and on the 27th rainfall was almost confined to Malabar, Bengal, Assam and Burma. Rain continued to fall in diminishing amounts in Malabar and Bengal until the end of the month, but held steadily in Burma. The large amount of 10·43 inches was registered at Port Blair on the last day of the month.

In Khandeish, Berar, Guzerat, Kathiawar and Central India (east), the rainfall of the month did not exceed a tenth of an inch. It averaged less than an inch in amount over the following districts in addition to the above :—the eastern and central districts of the North-Western Provinces, the whole of the Punjab except the central districts, the Konkan, the west and central districts of the Central Provinces, Sind, Rajputana, Hyderabad, Deccan, and the central districts of Madras (*i.e.*, Madras central and Madras east coast central). It exceeded 5 inches in Malabar, which obtained an average of 9·97 inches, North Behar and Chutia Nagpur (with averages of 5·44, and 5·38 inches, respectively), and Lower Burma, Tenasserim, Arakan, and the whole of Assam and Bengal, and exceeded 10 inches in North Bengal (13·71 inches), East Bengal (14·05 inches), Arakan (11·12 inches), Assam (Brahmaputra Valley, 11·75 inches), and Assam (Surma, 27·12 inches).

The rainfall of the month was above the average over the greater part of Northern and Central India, including Assam, Bengal, Behar, Orissa, Chutia Nagpur, Oudh and the North-Western Provinces, the central and western districts of the Punjab, the east and central districts of the Central Provinces and Sind, in consequence of the frequent periods of disturbance during the month. The excess was neither large nor important over the greater part of the area. It exceeded two inches in the following districts :—

District.	Excess in inches.	Excess expressed as percentage.
Central Bengal	+4·50	84
Assam (Surma)	+3·65	15
Eastern Bengal	+2·45	21
Deltaic Bengal	+2·28	35
North Bengal	+2·04	17
Chutia Nagpur	+2·30	75
North Behar	+2·58	90

The rainfall of the month was deficient over the Peninsula and in Burma. The partial advances of south-west monsoon humid winds preliminary to the permanent ad-

vance were fewer in number and feebler than usual, and the permanent advance was later than usual in commencing over the south of the Bay and the Arabian Sea, and did not take place in the latter sea area until the middle of June. Hence there was a large deficiency in the rainfall of Malabar, Southern India (including South Madras, Coorg and Mysore), Tenasserim and Lower Burma. The following gives data for these areas of most deficient rainfall :—

DISTRICT.	Amount of deficiency.	Deficiency expressed as percentage.
	Inches.	
Tenasserim	—11·03	53
Lower Burma	—6·78	56
Central ,,	—6·18	68
Arakan	—9·51	46
Coorg	—4·58	51
Malabar	—3·55	26
Konkan	—2·78	87

The deficiency in the Madras Presidency ranged from ·3 inch in the east coast districts, north (*i.e.*, the Circars Ganjam, &c.), to 1·86 inches in Madras and 3·55 inches in Malabar.

Explanation of Tables.

Table I gives an abstract of the meteorological observations at 8 A.M., daily, taken at 158 stations in India during the month of May 1891.

In this Table the observing stations are grouped under two sets of divisions. According to the first arrangement India and Burma are divided into eleven large meteorological areas or provinces. These divisions have been selected in consultation with the Medical Department. The climatic conditions of each area are fairly uniform, and they hence are presumed to form suitable areas for the discussion of the relations between disease and meteorology. The names of these divisions are printed in bold type, and the mean variations of the more important meteorological data, more especially temperature, are given opposite to each in prominent figures.

Each of these larger divisions is sub-divided into smaller meteorological areas or districts, of which there are 51 in all. This sub-division was made in consultation with the Revenue and Financial Departments. In each of these smaller areas the distribution and character of the rainfall are fairly uniform, and the staple crops in each are hence the same. This sub-division will, it is hoped, enable a more exact comparison to be made between crops and rainfall than has been hitherto possible.

The headings of the columns in the great majority of cases explain themselves. The figures in the third column "variation from normal" are obtained by taking in each case the difference between the mean actual barometer (reduced for temperature, but not to sea-level or constant gravity) and the normal means obtained from the observations of the eleven years' period 1878—88.

The "mean daily temperature" is assumed in Table I to be the mean of the maximum and minimum. It is chiefly utilized in order to obtain the mean variation of the temperature of the month from the normal.

In obtaining the figures for the column headed "number of rainy days," a rainy day is assumed to be one on which a fall of a tenth of an inch or upwards has been recorded. A fall of less than a tenth of an inch is practically of no value for agricultural purposes in India, and it has not been found possible to secure the accurate record of rainfalls of less than a tenth of an inch at a great majority of the rainfall recording stations.

Table II gives an abstract of the observations recorded at 10 A.M. and 4 P.M. at 89 second class observatories throughout India, Burma, and the adjacent regions. This Table is intended in part to supplement Table I, and hence information given in full in the latter Table, as, for example, rainfall, is not included in Table II. This Table is intended to give for the month, so far as is possible, all the information furnished hitherto in the Appendix A of the Annual Report on the meteorology of India. The methods of calculating the means have been very fully explained in the Annual Reports, to which the reader is referred for complete information. The data of the mean daily pressure, the figures of which are given in the sixth column, are the means of the 10 and 16 hours, observations, with corrections obtained from a comparison of the 10 and 16 hours' observation of the same or a neighbouring observatory, with a series of hourly observations at the same observatory.

The mean temperature is calculated by the formula mean $= \frac{maximum + 16\ hours + 2\ minimum}{4}$ by applying a constant correction for each month, derived from the hourly observations of the same or of a neighbouring station.

The mean daily vapour tension and humidity are the averages of the values for 10 A.M., 4 P.M., and the minimum readings and the mean daily cloud is the average of the mean amounts for 10 and 16 hours.

The mean wind directions for each month are the trigonometrical resultant of the winds given under each of the eight cardinal points, and are calculated by means of Lambert's formula, in which an equal weight or value is given to every wind.

It should be noted that in the preceding discussion, in speaking of the maximum, minimum, or mean temperature, the total amount of wind or the rainfall of a given day, as, for example, the 5th, the maximum, &c., of the 24 hours preceding 8 A.M of the 5th is meant. This definition has been adopted to avoid confusion. As the observations are taken at 8 A.M., a part of them refer to 8 A.M., of that day and a part to the previous 24 hours, and, therefore, including a portion of the previous civil day. It is found most convenient to use the same date to designate and define both classes of observations.

Table

Abstract of Observations taken at 8 A.M., at 158 Stations

Meteorological Province or District.	Station.	Height of Station 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.
Burma Coast and Bay Islands.		...	...	+·012	...	...	...	...	...	...	...	94·5	+3·4	77·7	+1·6	86·1	+2·6	16·7	...	...	...	...	25·5
Bay Islands	Port Blair	61·16	29·800	?	29·791	29·895	2nd	29·682	26th	·213	84·9	93·0	?	80·2	?	86·6	?	12·8	97·0	18th	73·9	31st	23·1
Tenasserim	Mergui	96·27	29·780	?	29·806	29·872	1st	29·710	22nd	·162	83·7	93·3	?	71·9	?	82·5	?	21·4	98·1	24th	69·5	2nd, 25th & 31st.	28·6
	Tavoy	26·26	29·900	?	29·860	30·002	2nd	29·820	30th	·182	83·7	94·7	?	76·4	?	85·6	?	18·3	98·7	23rd & 24th.	72·7	2nd	26·0
	Moulmein	93·79	29·781	+·014	29·814	29·878	2nd	29·652	30th	·226	83·7	95·1	+4·9	79·4	+3·9	87·3	+4·4	15·7	99·4	10th	74·3	13th	25·1
	Toungoo	181·1	29·654	+·013	29·776	29·753	2nd	29·513	30th	·240	86·7	101·6	+5·4	79·3	+3·1	90·5	+4·3	22·3	106·7	19th	74·7	29th	32·0
Lower Burma	Rangoon	40·69	29·817	+·004	29·796	29·918	1st	29·674	30th	·244	83·1	?	?	77·5	+0·4	?	?	?	?	?	73·9	31st	?
	Bassein	21	29·833	+·016	29·792	29·935	2nd	29·680	30th	·255	83·9	96·2	+4·2	77·6	+0·8	87·0	+2·5	18·6	100·7	4 days	71·9	31st	28·8
	Diamond Island	41	29·823	+·014	29·801	29·934	2nd	29·659	30th	·275	85·3	90·7	+1·8	76·5	−2·2	83·6	−0·2	14·2	93·3	20th	72·0	28th	21·3
Arakan	Akyab	20·44	29·817	+·011	29·782	29·953	2nd	29·625	30th	·328	84·1	91·2	+0·8	80·8	+3·4	86·0	+2·1	10·4	94·1	6th & 23rd.	75·1	7th	19·0
Burma, Inland		...	...	+·020	...	...	...	...	...	...	...	99·4	+4·6	75·8	+0·7	87·6	+2·7	23·7	...	...	...	...	34·8
Central Burma	Thayetmyo	134	29·691	+·020	29·767	29·778	1st & 2nd.	29·544	30th	·234	87·9	104·1	+4·6	78·0	+0·7	91·1	+2·7	26·1	110·7	20th	72·5	31st	38·2
Upper Burma	Mandalay	?	29·565	?	?	29·691	6th	29·398	30th	·293	88·9	103·8	?	80·1	?	92·0	?	23·7	109·4	19th	73·1	10th	36·3
	Kindat	?	29·450	?	?	29·620	2nd	29·334	27th	·286	80·5	94·5	?	72·7	?	83·6	?	21·8	99·8	5 days	69·0	11th, 22nd & 31st.	30·8
	Bhamo	?	29·398	?	?	29·598	1st	29·198	30th	·400	78·1	95·3	?	72·3	?	83·8	?	23·0	102·1	25th	68·3	1st, 3rd & 9th.	33·8
Assam		...	...	+·001	...	...	...	...	...	...	...	84·3	−2·6	71·0	−1·1	77·7	−1·2	13·3	...	...	...	...	25·9
Assam (Surma)	Silchar	104·3	29·718	+·010	29·774	29·847	1st	29·472	30th	·375	76·7	87·2	−0·7	71·4	−0·7	79·3	−0·7	15·8	93·5	4th & 25th.	65·8	1st	27·7
Brahmaputra	Sibsagar	333	29·472	−·017	29·764	29·608	2nd	29·284	30th	·324	74·3	83·2	−3·3	70·3	−1·1	76·8	−2·2	12·9	92·1	26th	63·3	2nd	28·8
	Dhubri	115·34	29·681	+·011	29·751	29·812	2nd	29·459	30th	·353	73·8	82·4	−3·7	71·3	−1·5	76·8	−2·6	11·1	87·7	29th	66·4	10th	21·3
Bengal and Orissa		...	...	+·012	...	...	...	...	...	...	..	91·2	−1·0	74·7	−0·2	83·0	−0·6	16·5	...	...	...	...	29·1
East Bengal	Chittagong	86·7	29·729	+·009	29·763	29·868	2nd	29·516	29th	·352	80·9	87·9	0	73·4	−1·6	80·7	−0·8	14·5	90·2	26th	68·3	1st & 9th	21·9
	Lungleh	?	?	?	?	?	?	?	?	?	66·6	70·9	?	50·1	?	60·5	?	20·8	73·9	6 days	35·4	22nd	38·5
	Noakholly	42·73	29·762	?	29·752	29·900	2nd	29·548	30th	·352	81·4	87·8	?	73·9	?	80·3	?	13·9	90·5	12th	63·0	15th	27·5
	Comilla	34·75	29·774	?	29·757	29·902	1st	29·540	30th	·362	80·1	88·7	?	72·4	?	80·6	?	16·3	91·3	16th, 25th & 26th.	65·8	8th	25·5
	Serajgunj	46·37	29·731	?	29·727	29·868	1st	29·509	30th	·359	77·6	88·3	?	72·2*	?	80·3*	?	16·1	91·6	7th	61·8	2nd	29·8
	Dacca	21·7	29·765	+·018	29·735	29·924	19th	29·556	30th	·368	80·2	89·9	−1·0	74·2	−1·4	82·1	−1·2	15·7	93·1	16th	67·2	14th	25·9
	Burrisal	12	29·772	+·020	29·729	29·909	1st & 19th.	29·550	30th	·359	82·7	90·8	+1·3	75·2	−0·9	83·0	+0·2	15·6	93·8	19th	68·4	1st	25·4
	Mymensingh	55·18	29·738	+·009	29·747	29·878	1st	29·510	30th	·368	76·8	85·6	−3·4	72·6	+0·9	79·1	−1·3	13·0	89·7	4 days	67·6	12th	22·1
Deltaic Bengal	Furreedpore	39	29·749	?	29·736	29·877	2nd	29·552	30th	·325	80·7	90·3	?	73·6	?	82·0	?	16·7	93·5	6th, 9th & 16th.	68·9	14th & 17th.	24·6
	Jessore	33·29	29·730	+·008	29·710	29·871	2nd	29·539	29th	·332	82·3	92·4*	−1·8	75·7	−0·6	84·1*	−1·2	16·7	95·7	16th	66·5	1st	29·2
	Calcutta	21·38	29·735	+·016	29·702	29·888	2nd	29·510	30th	·378	83·8	93·7	+0·3	77·6	+0·8	85·7	+0·6	16·1	99·1	4th	71·2	11th	27·9
	Saugor Island	25·3	29·735	+·013	29·704	29·901	2nd	29·505	30th	·396	85·7	92·1	+0·6	81·7	+1·4	86·9	+1·0	10·4	95·7	29th	75·0	11th	20·7
	Kishnaghur	46·64	29·700	?	29·695	29·834	2nd	29·493	30th	·341	82·2	94·2	?	75·6	?	84·9	?	18·6	100·7	5th	68·7	10th	32·0
	Midnapore	148·88	29·596	?	29·690	29·744	2nd	29·347	30th	·397	84·1	99·6	?	77·5	?	88·6	?	22·1	107·4	5th & 6th.	69·2	20th	38·2
Central Bengal	Bankoora	300	29·424	?	29·672	29·568	2nd	29·219	30th	·349	82·5	99·1	?	77·1	?	88·1	?	22·0	106·6	4th & 5th.	70·6	11th	36·0
	Raneegunge	345·15	29·408	?	29·691	29·553	2nd	29·188	30th	·365	82·5	98·7	?	76·9	?	87·8	?	21·8	106·5	6th	68·4	19th	38·1
	Burdwan	99·09	29·652	+·016	29·697	29·802	2nd	29·428	30th	·374	82·2	96·8	−0·1	77·6	+0·6	87·2	+0·3	19·2	104·7	5th	70·4	11th	34·3

* Mean of 30 days.

I.

in India, Burma, &c., in May 1891.

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 31st May 1891.	Normal rainfall for period, 1st March to 31st May.	Variation from normal of period.	Station.	Meteorological Province or District.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	8·76	12·12	−3·36	...	...	...	**Burma Coast and Bay Islands.**	
2	...	3	1	3	5	4	8	5	6	7	−14	83	·991	4·7	11	...	...	18·36	16·15	+2·21	18·71	18·91	−0·20	Port Blair .	BAY ISLANDS.
...	9	1	1	1	2	8	...	9	3	2	+50	79	·904	5·7	8	...	...	8·00	16·89	−8·89	10·76	25·07	−14·31	Mergui .	TENASSERIM.
25	1	2	...	...	...	2	...	1	2	?	?	79	·902	2·8	8	...	...	12·31	16·83	−4·52	12·55	21·52	−8·97	Tavoy.	
...	...	...	5	7	8	8	2	1	4	3	+33	78	·898	3·8		...	...	10·62	15·88	−5·26	11·43	18·93	−7·50	Moulmein.	
...	...	...	1	15	13	2	...	...	5	4	+25	75	·963	4·4	7	...	...	3·75	6·15	−2·40	4·21	8·08	−3·87	Toungoo.	
...	1	...	2	3	3	9	11	2	6	5	+20	80	·907	3·7	8	...	...	3·87	9·56	−5·69	3·87	11·38	−7·51	Rangoon .	LOWER BURMA.
3	...	...	1	5	3	1	2	16	7	4	+75	78	·943	6·0	8	...	...	8·29	7·92	+0·37	8·29	9·35	−1·06	Bassein.	
...	4	...	1	5	4	3	3	11	7	7	0	75	·964	5·5	6	...	...	2·77	8·76	−5·99	2·77	10·10	−7·33	Diamond Island.	
1	5	11	8	2	3	1	...	...	3	4	−25	79	·904	6·7	8	...	...	10·86	10·99	−0·13	12·87	12·61	+0·26	Akyab .	ARAKAN.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...	1·68	5·21	−3·53	...	...	...	**Burma, Inland.**	
...	1	...	1	7	12	3	2	5	8	7	+14	58	·762	3·9	4	...	...	1·65	3·64	−1·99	2·75	4·33	−1·58	Thayetmyo	CENTRAL BURMA.
...	2	...	4	3	18	1	3	...	...	?	?	61	·833	6·0	5	...	...	1·71	6·77	−5·06	2·14	?	?	Mandalay .	UPPER BURMA.
13	5	5	...	2	...	2	...	4	5	?	?	93	·971	1·0	17	...	...	6·65	?	?	7·91	?	?	Kindat.	
...	...	3	...	2	...	6	5	15	...	?	?	75	·715	6·3	7	...	...	3·81	?	?	5·40	?	?	Bhamo.	
...	...	...	...	...	...	..	...	...	...	...	...	...	...	...	...	...	...	14·92	14·64	+0·28	...	...	...	**Assam.**	
17	...	3	7	3	...	...	...	1	1	3	−67	85	·784	4·2	22	...	...	18·69	18·05	+0·64	31·22	42·41	−11·19	Silchar .	ASSAM (SURMA).
1	...	14	3	4	...	7	2	...	2	3	−33	92	·781	8·7	20	...	...	11·27	12·08	−0·81	25·04	25·45	−0·41	Sibsagar .	BRAHMAPUTRA.
3	1	13	5	3	1	2	2	1	3	7	−57	90	·749	7·9	19	...	...	14·80	13·80	+1·00	22·52	21·54	+0·98	Dhubri.	
...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	10·72	6·88	+3·84	...	...	...	**Bengal and Orissa.**	
4	...	1	8	11	6	1	...	...	3	6	−50	82	·859	5·5	17	...	...	11·25	10·63	+0·62	20·71	17·06	+3·65	Chittagong	EAST BENGAL.
			Not	recor	ded.				?	?	?	80	·515	?	23	...	...	22·20	?	?	31·58	?	?	Lungleh.	
1	...	2	4	9	14	1	...	...	3	?	?	83	?	2·7	16	...	...	14·95	9·44	+5·51	22·09	16·60	+5·49	Noakholly.	
...	...	1	2	8	20	..	...	...	6	?	?	83	?	3·2	20	...	...	24·20	10·37	+13·83	40·68	19·97	+20·71	Comilla.	
...	...	2	11	9	7	...	2	...	4	?	?	88	?	6·5	14	...	...	8·67	?	?	14·75	?	?	Serajgunj.	
2	1	3	3	10	12	...	...	...	7	6	+17	85	·879	5·6	20	...	...	17·06	8·38	+8·68	25·19	17·22	+7·97	Dacca.	
7	1	1	...	9	11	1	...	1	6	?	?	83	·936	4·4	15	...	...	7·34	8·06	−0·72	11·81	14·04	−2·23	Burrisal.	
1	...	5	16	7	1	...	1	...	6	?	?	88	·811	6·5	17	...	...	18·29	11·12	+7.17	24·28	17·36	+6·92	Mymensingh.	
3	...	1	2	12	11	1	1	...	6	?	?	87	?	5·2	16	...	...	9·79	8·43	+1·36	18·44	15·28	+3·16	Furreedpore	DELTAIC BENGAL.
4	...	...	2	15	7	2	...	1	4	5	−20	86	·953	6·8	13	...	...	13·27	7·36	+5·91	20·54	13·90	+6·64	Jessore.	
1	...	1	5	6	11	7	...	...	7	7	0	80	·927	5·9	8	...	...	4·18	5·97	−1·79	8·66	9·08	−0·42	Calcutta.	
...	2	1	...	3	17	8	...	...	20	15	+33	80	·989	7·2	3	...	...	1·51	4·39	−2·88	4·40	7·19	−2·79	Saugor Island.	
...	...	1	5	10	11	3	1	...	8		?	65	?	5·8	13	...	...	11·88	6·44	+5·44	16·59	10·16	+6·43	Kishnaghur.	
2	2	...	4	3	20	...	...	...	8	?	?	75	?	2·6	8	...	...	7·29	5·32	+1·97	15·22	8·37	+6·85	Midnapore.	
5	...	1	7	10	8	...	...	...	5	?	?	78	?	4·3	9	...	...	10·40	3·42	+6·98	13·76	6·44	+7·32	Bankoora .	CENTRAL BENGAL.
3	1	1	7	9	6	4	...	...	3	?	?	79	?	3·4	6	...	...	11·14	?	?	18·09	?	?	Raneegunge.	
2	...	...	3	8	13	4	1	...	5	5	0	78	·853	6·1	13	...	...	13·98	5·76	+8·22	20·89	9·12	+11·77	Burdwan.	

Table

Abstract of Observations taken at 8 A.M., at 158 Stations

Meteorological Province or District.	Station.	Height of Station 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.
Central Bengal —*contd.*	Nya Doomka	490	29·241	?	29·683	29·362	2nd	29·038	30th	·324	83·4	96·9	?	75·8	?	86·4	?	21·1	105·4	6th	69·8	22nd	35·6
	Berhampore	66·45	29·677	+·003	29·692	29·801	2nd	29·488	30th	·313	79·5	94·9	−0·6	74·8	−1·1	84·9	−0·9	20·1	103·7	6th	68·2	21st	35·5
	Rampore Bauleah.	70	29·687	?	29·707	29·801	2nd	29·476	30th	·325	80·1	91·3	?	74·2	?	82·8	?	17·1	103·3	23rd	67·7	12th	35·6
	Maldah	80	29·668	?	29·700	29·786	2nd	29·466	30th	·320	80·3	93·5	?	74·1	?	83·8	?	19·4	101·0	2nd & 6th	68·5	10th	32·5
	Bogra	61·48	29·700	+·025	29·714	29·813	1st	29·491	30th	·322	78·3	89·2	−3·7	72·9	−0·9	81·0	−2·3	16·3	95·3	2nd	67·7	5th	27·6
North Bengal	Dinagepore	117·59	29·647	−·003	29·719	29·782	2nd	29·429	30th	·353	76·6	88·4	−2·9	72·7	−0·4	80·6	−1·7	15·7	99·1	2nd	66·3	13th	32·8
	Rungpore	123	29·670	?	29·748	29·805	2nd	29·450	30th	·355	76·2	86·7	?	71·4	?	79·1	?	15·3	99·3	12th	63·7	12th	35·6
	Jalpaiguri	283·7	29·494	+·002	29·734	29·632	2nd	29·285	30th	·347	76·6	84·9	−2·6	70·8	−0·1	77·9	−1·4	14·1	89·9	2nd	65·9	10th	24·0
Orissa	Balasore	53·98	29·686	+·012	29·686	29·853	2nd	29·442	30th	·411	84·9	95·5	+0·6	77·8	+0·2	86·7	+0·4	17·7	103·5	4th	73·8	25th & 26th.	29·7
	False Point	20·60	29·737	+·009	29·699	29·901	2nd	29·516	30th	·385	85·0	89·8	−1·5	79·3	+0·2	84·6	−0·7	10·5	91·5	30th & 31st	75·1	25th	16·4
	Cuttack	80	29·671	+·021	29·693	29·849	2nd	29·438	30th	·411	85·9	100·6	−0·4	79·5	+0·1	90·1	−0·2	21·1	108·9	4th & 5th	72·8	13th	36·1
	Shortt's Island	?	29·714	?	?	29·883	2nd	29·505	30th	·378	84·7	89·2	?	80·6	?	84·9	?	8·6	91·6	5th & 12th	74·4	13th	17·2
	Pooree	11·99	29·743	?	29·694	29·922	2nd	29·500	30th	·422	82·8	88·1	?	80·2	?	84·1	?	7·9	91·2	31st	74·1	14th	17·1
Gangetic Plain and Chutia Nagpur.		...	...	+·012	...	...	...	...	...	...		99·7	−0·7	76·1	−0·6	87·9	−0·7	23·6	...	...	...	...	36·5
Chutia Nagpur	Hazaribagh	2,007·12	27·739	+·015	29·651	27·877	2nd	27·521	30th	·356	86·5*	101·3*	+2·9	75·0*	+1·0	88·2*	+2·0	26·3	104·5	16th	70·7	23rd & 24th.	33·8
	Ranchee	2,128·14	27·626	?	29·659	27·773	2nd	27·404	30th	·369	83·1	96·5	?	73·4	?	84·9	?	23·1	102·5	8th, 9th & 16th.	64·0	24th	38·5
	Chybassa	760	28·966	?	29·663	29·119	2nd	28·735	30th	·384	86·2	103·6	?	78·7	?	91·2	?	24·9	109·3	16th	72·2	11th	37·1
Behar, South	Gya	374·5	29·331	+·008	29·655	29·476	2nd	29·172	30th	·304	86·1	104·0	−0·1	80·0	+2·4	92·0	+1·2	24·0	108·6	16th	73·3	26th	35·3
	Dehree	351·14	29·346‡	?	29·645‡	29·496	2nd	29·159	30th	·337	87·3†	103·9†	?	78·7†	?	91·3†	?	25·2	108·9	16th	73·9	3rd	35·0
	Patna	182·84	29·528	−·002	29·662	29·679	2nd	29·311	30th	·368	83·4	98·7	−0·8	76·0	−1·2	87·3	−1·0	22·7	104·5	4th & 6th.	70·2	2nd	34·3
	Arrah	190·02	29·515	?	29·656	29·660	2nd	29·296	30th	·364	84·9	100·6	?	77·1	?	88·9	?	23·5	106·4	7th	70·7	4th	35·7
	Buxar	239·22	29·457	?	29·648	29·590	2nd	29·240	30th	·350	86·3	100·7	?	78·1	?	89·4	?	22·6	106·4	8th	70·4	2nd	36·0
Behar, North	Purneah	125	29·634	+·020	29·713	29·770	2nd	29·421	30th	·349	78·6	91·7	−2·9	72·1	−1·3	81·9	−2·1	19·6	100·8	2nd	64·3	1st	36·5
	Bhagalpur	159·78	29·567	?	29·679	29·699	2nd	29·340	30th	·359	81·4	95·2	?	74·4	?	84·8	?	20·8	102·8	2nd	70·0	21st	32·8
	Durbhunga	166·32	29·585	+·019	29·705	29·716	2nd	29·386	30th	·330	81·2	94·0	−1·4	74·4	−1·4	84·2	−1·4	19·6	99·9	6th & 7th.	68·5	1st & 10th.	31·4
	Mozufferpore	178·42	29·541	?	29·672	29·682	2nd	29·324	30th	·358	80·0	94·8	?	75·0	?	84·9	?	19·8	100·4	7th	66·3	2nd	34·1
	Motiharee	223·61	29·503	?	29·685	29·638	2nd	29·293	30th	·345	80·6	94·7	?	73·0	?	83·8	?	21·7	101·2	5th	62·8	1st	38·4
	Chupra	181·3	29·525	?	29·658	29·662	2nd	29·304	30th	·358	83·0	99·4	?	75·5	?	87·5	?	23·9	104·3	4 days	69·7	2nd	34·6
N.-W. Provinces (Eastern Districts).	Benares	266·97	29·437	+·016	29·659	29·589	2nd	29·207	30th	·382	85·7	103·8	−0·7	76·9	−1·7	90·4	−1·2	26·9	109·8	8th	68·1	2nd	41·7
	Allahabad	309·28	29·390	+·011	29·651	29·553	2nd	29·166	30th	·387	89·0	105·5	−0·7	78·0	−0·6	91·8	−0·7	27·5	110·4	8th, 16th & 31st.	71·6	2nd	38·8
N.-W. Provinces (Eastern Submontane).	Gorakhpur	255·93	29·463	+·019	29·679	29·576	2nd	29·243	30th	·333	82·3	98·4	−2·2	75·1	−1·6	86·8	−1·9	23·3	104·8	5th	67·2	2nd	37·6
Oudh, South	Lucknow	369·4	29·329	+·005	29·656	29·469	2nd	29·123	30th	·346	86·2	103·3	−0·8	75·8	−0·8	89·6	−0·8	27·5	110·3	8th	65·4	25th	44·9
N.-W. Provinces (Central).	Cawnpore	415·57	29·269	?	29·637	29·426	2nd	29·034	30th	·392	88·4	103·7	?	79·6†	?	91·9†	?	24·1	109·6	31st	72·0	19th	37·6
Upper—Sub-Himalayas		...	...	+·028	...	...	...	...	...	...	...	99·0	−2·4	72·0	−1·3	85·5	−1·9	27·0	...	...	...	...	44·3
N.-W. Provinces (Submontane).	Bareilly	568·47	29·128	+·016	29·660	29·269	2nd	28·904	30th	·365	83·5	102·3	−0·1	74·5	−0·7	88·4	−0·4	27·8	107·4	20th	67·1	2nd	40·3
	Dehra Dun	2,232·4	27·511	?	29·691	27·633	2nd	27·307	30th	·326	75·7	93·8	?	68·1	?	81·0	?	25·7	99·5	21st & 22nd.	60·5	25th	39·0
	Roorkee	886·63	28·815	+·023	29·665	28·935	2nd	28·602	30th	·333	84·0	101·8	−0·2	73·0	−0·9	87·1	−0·6	28·8	107·7	20th	64·3	1st & 2nd.	43·4
	Meerut	737·48	28·958	+·025	29·657	29·095	2nd	28·711	30th	·384	84·6	100·8	−1·0	72·3	−2·6	86·6	−1·8	28·5	108·2	20th	65·0	25th & 26th.	43·2
Punjab (Central).	Delhi	717·81	28·985	+·034	29·662	29·113	1st	28·748	30th	·365	85·8	100·1	−4·3	78·3	−0·6	89·2	−2·5	21·8	109·0	31st.	65·1	25th	43·9
	Lahore	702·2	28·986	+·013	29·657	29·130	3rd	28·751	30th	·379	83·7	99·6	−3·4	70·3	−2·9	85·0	−3·2	29·3	109·8	20th & 31st. 31st	63·0	1st	46·8

* Mean of 24 days. † Mean of 30 days. ‡ Mean of 29 days.

I—*continued.*

in India, Burma, &c., in May 1891—continued.

Wind Direction. Number of Winds from									Wind Velocity.			Hygrometry, 8 A.M.		Mean cloud amount.	Rainfall.								Station.	Meteorological Province or 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 1891.	Normal rainfall for period, 1st March to 31st May.	Variation from normal of period.		
2	...	...	7	15	4	2	...	1	6	?	?	72	?	1·0	7	...	...	7·82	3·63	+4·19	14·00	5·40	+8·60	Nya Doomka	Central Bengal. —*contd.*
1	...	...	14	7	7	1	1	...	5	5	0	88	·891	6·4	9	...	...	12·20	5·85	+6·35	16·38	8·46	+7·92	Berhampore.	
...	...	2	9	12	6	1	1	...	4	?	?	87	?	5·1	12	...	...	11·38	5·59	+5·79	17·78	8·55	+9·23	Rampore Bauleah.	
1	...	1	21	7	...	...	1	...	4	?	?	83	?	4·3	7	...	...	9·03	3·87	+5·16	13·27	6·07	+7·20	Maldah.	
4	...	5	17	3	...	1	1	...	4	?	?	83	·803	5·9	11	...	...	9·52	8·66	+0·86	13·36	11·79	+1·57	Bogra.	
...	2	11	14	1	1	...	...	2	3	?	?	85	·778	6·3	13	...	...	14·48	7·20	+7·28	17·28	9·99	+7·29	Dinagepore.	North Bengal.
3	4	1	18	2	3	...	...	...	4	?	?	83†	?	3·2	17	...	...	18·58	10·68	+7·90	22·04	14·91	+7·13	Rungpore.	
				Not recorded.					5	?	?	88	·807	2·8	14	...	...	12·66	12·03	+0·63	18·26	18·06	+0·20	Jalpaiguri.	
...	1	...	...	2	11	15	...	2	8	?	?	77	·934	2·5	11	...	...	5·93	4·94	+0·99	11·62	8·86	+2·76	Balasore	Orissa.
...	...	1	...	2	13	13	1	1	15	13	+15	82	·983	6·7	4	...	...	2·63	4·68	−2·05	4·59	6·70	−2·11	False Point.	
5	...	1	1	2	8	12	1	1	5	5	0	72	·885	4·5	7	...	...	5·43	4·11	+1·32	8·80	5·90	+2·90	Cuttack.	
...	1	...	1	2	2	24	1	...	9	?	?	84	1·005	4·7	5	...	...	2·27	?	?	4·08	?	?	Shortt's Island.	
2	2	1	1	2	...	21	2	...	15	?	?	89	?	4·1	3	...	...	3·59	2·66	+0·93	6·53	4·11	+2·42	Pooree.	
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3·28	2·11	+1·17	...	...	...	**Gangetic Plain and Chutia Nagpur.**	
...	...	1	...	2	12	9	5	2	10	9	+11	37*	·454*	5·2	5	...	...	4·65	2·71	+1·94	7·31	3·84	+3·47	Hazaribagh.	Chutia Nagpur.
11	1	1	1	...	4	10	3	...	5	?	?	57	?	3·1	6	...	...	4·61	2·36	+2·25	12·44	4·28	+8·16	Ranchee.	
6	...	3	1	1	1	10	8	1	3	?	?	60	?	3·4	5	...	...	4·57	4·08	+0·49	9·83	5·97	+3·86	Chybassa.	
2	1	...	10	1	15	...	1	1	5	4	+25	67	·833	4·3	1	...	...	0·29	1·33	−1·04	2·74	2·12	+0·62	Gya	Behar, South.
13	1	1	5	3	3	4	...	...	7‡	?	?	60†	?	2·0†	1	...	...	0·39	?	?	2·68	?	?	Dehree.	
1	...	1	26	1	1	...	1	...	6	5	+20	67	·757	2·1	2	...	...	2·03	2·25	−0·22	4·72	2·84	+1·88	Patna.	
...	...	10	9	6	4	1	...	1	3	?	?	63	?	2·2	1	...	...	1·28	1·53	−0·25	4·02	2·53	+1·49	Arrah.	
2	...	8	12	2	2	1	2	2	6	?	?	53	?	1·9	2	...	...	0·29	0·99	−0·70	1·61	1·42	+0·19	Buxar.	
6	...	8	14	3	...	...	...	...	2	3	−33	81	·790	4·8	8	...	...	9·83	4·65	+5·18	12·03	6·28	+5·75	Purneah	Behar, North.
11	...	4	10	2	4	...	...	...	3	?	?	76	?	3·5	6	...	...	8·02	2·67	+5·35	11·09	3·90	+7·19	Bhagalpur.	
...	...	7	17	6	...	1	...	...	7	6	+17	73	·790	2·4	5	...	...	3·46	3·50	−0·04	5·58	4·42	+1·16	Durbhunga.	
1	...	2	22	5	...	...	1	...	3	?	?	88	?	2·0	6	...	...	2·15	2·42	−0·27	4·26	3·39	+0·87	Mozufferpore.	
1	...	10	15	4	...	1	...	...	4	?	?	70	?	2·3	8	...	...	6·79	2·44	+4·35	9·88	3·59	+6·29	Motiharee.	
...	...	...	27	1	...	1	2	...	6	?	?	68	?	1·6	1	...	...	1·10	1·44	−0·34	4·29	2·20	+2·09	Chupra.	
13	1	6	5	...	2	3	...	1	5	5	0	64	·793	3·0	2	...	...	0·43	0·78	−0·35	1·66	1·08	+0·58	Benares	N.-W. Provinces (Eastern Districts).
3	...	5	3	4	2	3	7	4	5	4	+25	45	·599	2·9	1	...	...	0·72	0·37	+0·35	1·87	0·74	+1·13	Allahabad.	
4	...	6	15	2	2	...	2	...	3	4	−25	66	·729	1·6	4	...	...	1·33	1·45	−0·12	4·22	2·19	+2·03	Gorakhpur	N.-W. Provinces (Eastern Submontane).
12	1	1	7	...	...	2	6	2	3	4	−25	46	·564	3·1	2	...	..	4·18	0·98	+3·20	6·63	1·29	+5·34	Lucknow	Oudh, South.
2	2	2	3	2	5	8	5	2	5	?	?	50	·668	1·6	1	...	...	0·66	?	?	2·36	?	?	Cawnpore	N.-W. Provinces (Central).
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·88	1·11	−0·23	...	...	...	**Upper—Sub-Himalayas.**	
17	2	...	...	7	...	1	1	3	2	5	−60	53	·616	1·0	0	...	...	0·05	0·95	−0·90	3·37	2·10	+1·27	Bareilly	N.-W. Provinces (Submontane).
28	1	1	...	1	...	...	...	...	2	2	0	50	·437	2·3	4	...	...	1·30	1·91	−0·61	3·24	4·14	−0·90	Dehra Dun.	
12	...	...	...	9	4	...	4	2	3	4	−25	41	·462	1·0	2	...	...	1·39	0·91	+0·48	2·46	2·20	+0·26	Roorkee.	
12	1	2	2	1	...	...	7	6	2	3	−33	43	·499	1·1	1	...	...	0·57	0·72	−0·15	1·91	2·05	−0·14	Meerut.	
13	1	1	1	2	...	2	10	1	3	4	−25	43	·514	2·5	4	...	...	1·56	0·60	+0·96	2·84	1·37	+1·47	Delhi	Punjab (Central).
5	6	3	6	...	2	...	4	5	3	3	0	43	·488	2·5	2	...	...	0·65	1·08	−0·43	4·03	2·15	+1·88	Lahore.	

Table

Abstract of Observations taken at 8 A.M., at 158 Stations

Meteorological Province or District.	Station.	Height of Station 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.
Punjab (Submontane).	Ludhiana	811·86	28·866	+·017	29·642	28·996	1st & 2nd.	28·630	30th	·366	84·6	101·3	−2·1	73·5	+0·1	87·4	−1·0	27·8	110·8	31st	64·1	25th	46·7
Punjab (North).	Sialkot	829·47	28·854	+·032	29·653	28·981	2nd & 3rd.	28·620	30th	·361	83·8	99·1	−3·3	72·7	−0·8	85·9	−2·1	26·4	108·8	31st	65·2	1st, 24th & 25th	43·6
	Rawalpindi	1,648·9	28·071	+·035	29·662	28·223	3rd	27·837	30th	·386	78·3	92·2	−5·0	65·6	−1·9	78·9	−3·5	26·6	104·5	31st	53·1	2nd	51·4
Indus Valley and North-West Rajputana.		...	...	+·045	...	...	...	...	...	...	...	101·6	−2·1	75·3	−0·7	88·5	−1·4	26·3	...	...	...	...	45·0
Punjab, West	Peshawar	1,110·4	28·653	+·065	29·702	28·839	2nd	28·436	30th	·403	79·5	92·4	−4·8	68·0	−1·3	80·2	−3·1	24·4	106·0	31st	60·0	3rd	46·0
	Khushab	611·51	29·072	?	29·653	29·238	3rd	28·860	30th	·378	84·5	99·7	?	72·6	?	86·2	?	27·1	112·0	28th	66·0	28th	46·0
	Montgomery	558·46	29·133	?	29·656	29·284	3rd	28·884	30th	·400	86·7	102·5	?	73·7	?	88·1	?	28·8	115·9	31st	67·2	8th	48·7
	D. I. Khan	572·56	29·131	+·039	29·675	29·332	3rd	28·865	30th	·467	83·6	100·4	−2·6	72·8	−1·3	86·6	−2·0	27·6	111·5	31st	61·8	3rd	49·7
	Mooltan	420·19	29·286	+·055	29·671	29·472	3rd	29·021	30th	·451	83·8	101·9	−2·3	74·6	−0·9	88·3	−1·6	27·3	113·3	31st	67·7	17th	45·6
	Sirsa	661·61	29·033	+·039	29·654	29·175	1st	28·792	30th	·383	86·7	104·1	−2·0	74·4	−1·3	89·3	−1·7	29·7	114·4	31st	64·3	13th	50·1
Sind and Cutch.	Jacobabad	185·9	29·517	+·059	29·663	29·739	3rd	29·251	30th	·488	87·3	107·9	−2·3	77·2	+0·8	92·6	−0·8	30·7	119·0	31st	70·7	15th	48·3
	Hyderabad	117·43	29·600	+·035	29·671	29·776	3rd	29·375	30th	·401	85·5	106·3	−0·6	78·0	−0·4	92·1	−0·5	28·3	117·2	31st	73·1	22nd	44·1
	Kurrachee	49	29·707	+·021	29·708	29·817	2nd	29·514	30th	·303	83·5	93·1	+0·3	78·0	−0·4	85·6	−0·1	15·1	103·8	23rd	73·3	7th	30·5
	Bhuj	394·9	29·377	?	29·720	29·494	3rd	29·200	30th	·294	85·8	101·9	?	76·1	?	89·1	?	25·8	109·1	27th	72·1	1st & 2nd.	37·0
Rajputana, West	Bickaneer	743·5	29·125	?	29·824	29·160	17th	29·069	10th	·091	88·7	103·1	?	80·4	?	91·7	?	22·7	112·9	30th	70·2	10th	42·7
	Pachpadra	380	29·346	?	29·677	29·437	3rd	29·289	22nd	·148	87·2	106·2	?	77·6	?	91·9	?	28·6	114·5	29th & 30th.	63·7	16th	50·8
East Rajputana, Central India and Guzerat.		...	...	+·027	...	...	...	...	...	..	...	102·6	−0·7	77·6	0	90·1	−0·4	24·9	...	...	...	...	38·8
Rajputana, East	Jeypore	1,430·6	28·314	+·027	29·690	28·445	2nd	28·098	30th	·347	87·2	103·8	−1·8	74·8	−1·4	89·3	−1·6	29·0	111·3	31st	66·0	16th	45·3
	Sambhar	1,253·52	28·474	+·030	29·676	28·598	2nd & 3rd.	28·258	30th	·340	87·3	102·7	−1·9	76·6	−1·4	89·7	−1·7	26·1	109·5	29th to 31st.	67·9	16th	41·6
	Ajmere	1,611	28·157	+·038	29·707	28·296	3rd	29·924	30th	·372	87·2	102·7	−0·5	79·4	+2·1	91·1	+0·8	23·3	108·5	29th to 31st	68·1	16th	40·4
	Deesa	465·5	29·311	+·026	29·728	29·438	3rd	29·170	30th	·268	87·7	107·6	+1·6	78·9	+1·5	93·3	+1·6	28·7	113·5	28th & 29th.	74·3	23rd	39·2
Kathiawar	Rajkot	428·83	29·376	+·034	29·756	29·489	2nd	29·227	30th	·262	83·4	104·7	−0·9	74·9	−0·4	89·8	−0·7	29·8	109·4	28th	68·8	2nd, 5th & 6th,	40·6
	Veraval	?	29·311	?	29·773	29·938	2nd	29·685	30th	·253	81·2	85·8	?	75·6	?	80·7	?	10·2	87·8	15th, 19th & 30th.	71·3	1st, 2nd & 6th.	16·5
	Bhavnagar	?	29·797	?	29·783	29·915	2nd	29·680	30th	·235	86·1	102·5	?	78·2	?	90·4	?	24·3	107·4	22nd	71·0	27th	36·4
Central India	Nowgong	757·04	28·959	+·021	29·663	29·114	2nd	28·749	30th	·365	89·8	105·0	−2·5	78·0	−1·2	91·5	−1·9	27·0	111·6	31st	70·0	25th	41·6
	Sutna	1,040·1	28·666	+·015	29·649	28·829	2nd	28·452	30th	·377	91·1	101·4	−0·2	77·5	−0·5	91·0	−0·4	26·9	111·1	31st	69·1	25th	42·0
	Indore	1,823·2	27·961	+·020	29·703	28·054	1st	27·796	30th	·258	88·1	101·9	−0·5	75·5	+0·1	88·7	−0·2	26·4	106·8	29th	69·5	4th, 6th & 7th.	37·3
	Neemuch	1,630	28·146	+·035	29·710	28·258	1st	27·935	30th	·323	87·4	102·6	−1·5	78·0	+1·7	90·3	+0·1	24·6	110·1	29th	71·1	10th	39·0
Guzerat	Surat	36	29·806	+·025	29·786	29·914	2nd	29·695	26th	·219	87·4	100·7	+2·8	77·5	−0·1	89·1	+1·4	23·2	104·2	5 days	70·0	2nd	34·2
N.-W. P. (West)	Agra	555·44	29·170	+·035	29·681	29·333	2nd	28·918	30th	·415	88·2	105·7	−0·8	78·9	−1·7	92·3	−1·3	26·8	114·5	31st	68·5	25th	46·0
	Jhansi	840·13	28·872	+·022	29·655	29·027	2nd	28·656	30th	·371	90·1	105·8	−1·7	82·9	+1·0	94·4	−0·4	22·9	113·5	31st	69·9	25th	43·6
Deccan		...	...	+·015	...	...	...	...	...	...	...	104·6	+0·7	77·5	+0·6	91·1	+0·7	27·1	...	...	...	...	39·0
Bombay, Deccan	Belgaum	2,524	27·331	+·005	29·770	27·430	3rd	27·250	22nd	·180	77·9	95·4	+2·0	68·5	+0·7	82·0	+1·4	26·9	99·8	11th & 20th.	63·9	25th	35·9
	Sholapur	1,589·7	28·238	+·027	29·754	28·336	2nd & 3rd.	28·125	26th	·211	85·8	106·3	+2·1	76·7	+0·8	91·5	+1·5	29·6	110·2	21st	70·0	7th & 8th.	40·2
	Poona	1,840·37	28·012	+·023	29·791	28·101	3rd	27·902	26th	·199	80·9	101·1	+2·8	70·8	−1·1	86·0	+0·9	30·3	105·3	12th	63·9	7th & 8th.	41·4
Khandeish	Malegaon	1,430·12	28·390	+·029	29·755	28·500	2nd & 3rd.	28·260	30th	·240	87·9	104·5	+1·2	74·6	0	89·6	+0·6	29·9	109·3	30th	65·3	4th	44·0
	Ahmednagar	2,151·62	27·693	?	29·758	27·802	3rd	27·581	26th	·221	84·0	101·5	?	72·8	?	87·2	?	28·7	105·7	29th	65·4	7th	40·3
Berar	Akola	930	28·833	+·015	29·699	28·959	3rd	28·697	30th	·262	89·5	108·0	+0·9	81·3	+0·7	94·7	+0·8	26·7	111·6	21st, 29th & 30th.	74·7	26th	36·9
	Amraoti	1,215·5	28·538	+·017	29·684	28·658	3rd	28·377	30th	·281	90·5	108·2	+1·0	81·7	+2·8	95·0	+1·9	26·5	113·9	30th	73·8	8th	40·1

I —*continued.*

in India, Burma, &c., in May 1891 —continued.

Wind Direction. Number of Winds from									Wind Velocity.			Hygrometry, 8 A.M.			Rainfall.										
Calm.	N.	NE	E.	SE.	S.	SW.	W.	NW.	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 March to 31st May 1891.	Normal rainfall for period, 1st March to 31st May.	Variation from normal of period.	Station.	Meteorological Province or District.
12	3	1	...	2	4	...	5	4	2	2	0	44	·516	2·8	2	...	...	0·45	0·83	−0·38	3·14	2·71	+0·43	Ludhiana.	Punjab (Sub-montane).
2	8	4	7	1	1	...	5	3	3	3	0	47	·539	2·5	2	...	...	0·83	1·19	−0·36	3·43	3·37	+0·06	Sialkot .	Punjab, North.
12	2	2	2	1	...	2	...	10	2	3	−33	52	·504	3·7	4	...	...	1·11	1·83	−0·72	5·25	5·80	−0·55	Rawalpindi.	
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·58	0·47	+0·11	...	...	...	**Indus Valley and North-Western Rajputana.**	
10	3	2	4	3	...	2	3	4	4	5	−20	53	·508	3·5	1	...	...	0·32	0·92	−0·60	4·54	4·77	−0·23	Peshawar .	Punjab, West.
1	4	5	4	1	3	6	4	3	7	?	?	35	·409	2·4	0	...	...	0·11	?	?	2·97	?	?	Khushab.	
2	5	4	2	5	5	1	2	5	7	?	?	39	·478	2·3	0	...	...	0	?	?	1·89	?	?	Montgomery	
12	4	2	4	...	1	2	1	5	2	2	0	56	·644	2·3	1	...	...	0·23	0·40	−0·17	3·17	1·77	+1·40	D. I. Khan.	
16	...	4	...	2	...	6	...	3	2	3	−33	51	·574	1·9	4	...	...	1·01	0·36	+0·65	1·82	0·89	+0·93	Mooltan.	
2	7	1	3	...	4	3	5	6	6	5	+20	51	·634	3·1	2	...	...	1·32	0·68	+0·64	2·24	1·43	+0·81	Sirsa.	
10	...	3	8	5	2	...	...	3	4	5	−20	44	·570	2·1	1	...	...	0·11	0·07	+0·04	0·56	0·25	+0·31	Jacobabad	Sind and Cutch.
...	...	3	...	...	...	28	...	...	9	13	−31	52	·631	1·6	1	...	...	0·53	0·13	+0·40	0·78	0·30	+0·48	Hyderabad.	
...	...	1	...	...	1	9	15	5	17	17	0	81	·939	2·4	0	...	...	0	0	0	1·18	0·62	+0·56	Kurrachee.	
...	...	...	...	...	...	4	20	7	15	15	0	61	·750	0·7	0	...	...	0	0·15	−0·15	0	0·40	−0·40	Bhuj.	
...	1	5	4	4	2	11	1	3	6	7	−14	45	·588	2·4	4	...	...	0·96	1·30	−0·34	1·80	1·59	+0·21	Bickaneer .	Rajputana, West.
7	...	...	3	1	1	18	1	...	10	9	+11	43†	·533†	0·2	3	...	...	1·33	0·66	+0·67	1·61	0·74	+0·87	Pachpadra.	
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·22	0·46	−0·24	...	...	...	**East Rajputana, Central India and Guzerat.**	
1	6	4	3	...	...	3	7	7	5	7	−29	39	·506	1·6	2	...	...	0·56	0·40	+0·16	2·04	0·57	+1·47	Jeypore .	Rajputana, East.
3	5	4	...	2	2	2	7	6	9	10	−10	39	·514	1·4	1	...	...	0·25	0·64	−0·39	0·95	1·07	−0·12	Sambhar.	
8	...	3	...	...	3	4	13	...	7	7	0	48	·609	1·3	1	...	...	0·33	0·75	−0·42	1·55	0·86	+0·69	Ajmere.	
...	8	3	1	...	1	4	5	9	12*	13	−8	48	·620	1·9	0	...	...	0	0·20	−0·20	0·09	0·26	−0·17	Deesa.	
...	1	...	...	...	...	2	15	13	13	13	0	81	·915	0·5	0	...	...	0·06	0·18	−0·12	0·22	0·18	+0·04	Rajkot .	Kathiawar.
6	2	...	...	...	...	...	10	13	7	?	?	85	·909	3·1	0	...	...	0	?	?	0	?	?	Veraval.	
...	...	...	...	...	...	17	12	2	13	?	?	68	·846	1·3	0	...	...	0	?	?	0·55	?	?	Bhavnagar.	
6	4	4	5	...	1	1	9	1	3	3	0	38	·515	2·8	1	...	...	0·27	0·36	−0·09	0·48	0·53	−0·05	Nowgong .	Central India.
12	6	1	...	1	2	1	6	2	6	8	−25	32	·462	0·5	1	...	...	0·24	0·40	−0·16	1·22	1·60	−0·38	Sutna.	
5	1	1	1	...	1	1	13	8	4	6	−33	38	·511	0·6	0	...	...	0	0·80	−0·80	0·08	0·80	−0·72	Indore.	
1	1	1	1	1	1	14	6	5	10	12	−17	54	·707	0·5	0	...	...	0	0·60	−0·60	0·35	0·75	−0·40	Neemuch.	
...	...	...	...	...	3	18	8	2	...	13	?	64	·839	2·1	0	...	...	0	0·29	−0·29	0·04	0·29	−0·25	Surat .	Guzerat.
2	...	3	...	3	1	11	2	9	5	3	+67	38	·489	2·0	0	...	...	0·08	0·59	−0·51	2·00	0·94	+1·06	Agra .	N.-W. P. (West).
3	4	1	4	3	1	6	1	8	4	5	−20	33	·449	1·0	2	...	...	0·79	0·31	+0·48	1·47	0·71	+0·76	Jhansi.	
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·48	1·03	−0·55	...	...	...	**Deccan.**	
6	2	...	...	2	1	...	7	13	4	18	−78	59	·560	3·4	3	...	...	1·01	2·23	−1·22	3·85	4·04	−0·19	Belgaum .	Bombay, Deccan.
...	4	2	...	1	1	2	11	10	9	10	−10	40	·489	4·0	1	...	...	0·29	0·95	−0·66	0·81	1·48	−0·67	Sholapur.	
4	...	...	...	...	...	...	12	15	12	14	−14	49	·515	3·0	2	...	...	1·34	1·71	−0·37	1·66	2·23	−0·57	Poona.	
...	...	...	1	...	...	4	11	15	11	10	+10	66	·871	2·8	1	...	...	0·29	0·78	−0·49	0·31	0·85	−0·54	Malegaon .	Khandeish.
1	10	2	...	2	...	...	3	13	9	?	?	66	·770	3·4	0	...	...	0·04	1·04	−1·00	0·41	1·26	−0·85	Ahmednagar	
...	...	...	...	...	...	1	7	23	9	8	+12	32	·446	3·5	0	...	...	0	0·44	−0·44	0·60	0·86	−0·26	Akola .	Berar.
...	...	1	3	...	...	7	15	5	7	6	+17	34	·490	2·9	0	...	...	0·04	0·96	−0·92	0·55	1·21	−0·66	Amraoti.	

* Mean of 27 days. † Mean of 21 days.

Table

Abstract of Observations taken at 8 A.M., at 158 Stations

Meteorological Province or District.	Station.	Height of Station 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.
Central Provinces (West).	Khandwa	1,043·71	28·726	+·021	29·716	28·846	3rd	28·586	30th	·260	88·3	106·3	+0·1	82·5	+2·3	94·4	+1·2	23·8	111·7	29th	75·3	1st & 6th.	36·4
	Hoshangabad	1,020	28·737	+·007	29·700	28·847	2nd	28·558	30th	·289	90·0	107·1	0·6	79·6	0	93·4	−0·3	27·5	111·6	29th to 31st	71·7	4th	39·9
	Nagpur	1,025	28·714	+·017	29·674	28·852	2nd	28·506	30th	·346	92·8	108·2	−0·4	81·6	+0·8	94·9	+0·2	26·6	114·9	30th & 31st.	74·1	5th	40·8
Central Provinces (Central).	Seoni	2,030	27·738	+·008	29·698	27·868	2nd	27·573	30th	·295	89·3	103·5	+0·3	76·9	+0·4	90·3	+0·4	26·6	108·2	30th & 31st.	70·1	11th	38·1
	Jubbulpore	1,327·02	28·407	+·019	29·672	28·554	2nd	28·222	30th	·332	88·4	104·7	−0·1	77·6	−0·9	91·2	−0·5	27·1	110·0	30th	72·1	8th	37·9
	Saugor	1761·5	27·991	+·016	29·671	28·129	2nd	27·818	30th	·311	89·1	105·5	+0·9	78·0	+0·5	91·8	+0·7	27·5	110·4	30th	71·6	25th	38·8
Central Provinces (East).	Raipur	960	28·766	+·022	29·670	28·912	2nd	28·548	30th	·364	90·0	104·9	−1·5	80·5	−0·3	92·7	0·9	24·4	110·7	30th & 31st	72·1	11th & 24th.	38·6
Hyderabad (South).	Secunderabad	1,786·69	28·016	−·015	29·723	28·138	2nd	27·891	25th	·247	86·0	103·9	+1·1	79·2	+1·6	91·6	+1·4	24·7	107·8	30th	71·4	10th	36·4
West Coast		...		−·005	...	...	...	...	...	...	...	90·1	+0·5	78·0	+0·3	83·8	+0·4	12·1	...	...	...	...	19·8
Konkan	Bombay	37	29·827	+·014	29·804	29·916	2nd	29·728	26th	·188	83·8	89·3	−0·7	80·1	−0·7	84·7	−0·7	9·2	90·9	27th, 29th & 30th.	77·0	6th	13·9
	Ratnagiri	110	29·737	+·009	29·786	29·824	2nd	29·654	24th	·170	85·8	90·8	−0·1	78·3	−0·6	84·6	−0·4	12·5	91·9	5 days	73·4	27th	18·5
	Mormugao	?	29·778	?	29·774	29·856	2nd	29·695	26th	·161	84·1	?	?	82·2	?	?	?	?	?	...	80·0	10th & 20th.	?
	Karwar	43·87	29·804	−·012	29·784	29·887	2nd	29·728	22nd	·159	82·8	90·3	+0·6	79·3	+0·3	84·8	+0·5	11·0	92·3	2nd & 3rd.	73·3	8th	19·0
Malabar	Mangalore	25·60	29·846	−·003	29·805	29·936	2nd	29·777	21st	·159	84·4	91·6	+1·7	79·9	+1·5	85·8	+1·6	11·7	93·3	3rd	74·4	13th	18·9
	Calicut	26·58	29·832	−·025	29·790	29·931	2nd	29·754	21st	·177	84·3	91·6	?	78·3	?	85·0	?	13·3	94·4	9th	72·6	17th	21·8
	Cochin	11·03	29·860	−·011	29·800	29·947	2nd	29·790	26th	·157	83·0	90·3	+1·0	78·2	+1·0	84·3	+1·0	12·1	93·3	4 days	74·2	10th	19·1
	Trivandrum	?	29·515	?	29·793	29·592	2nd	29·443	22nd	·149	81·8	87·0	?	67·7	?	77·4	?	19·3	91·5	16th & 17th.	64·0	21st & 23rd.	27.5
South India		...	...	−·002	...	...	...	...	...	...	...	96·9	+0·3	79·0	+1·1	88·0	+0·7	17·9	...	...	...	...	29·0
Madras, South	Madura	446·60	29·374	−·015	29·755	29·507	2nd	29·240	22nd	·267	84·7	99·0	−1·3	79·0	+2·5	89·0	+0·6	20·0	103·0	25th	75·0	20th	28·0
Madras, South (Central).	Salem	939·91	28·916	−·011	29·792	29·036	2nd	28·803	22nd	·233	84·1	101·2	+2·4	79·2	+4·0	90·3	+3·2	22·0	105·9	7th	74·0	23rd & 24th.	31·9
	Coimbatore	1,347·64	?	?	?	?	?	?	?	?	80·5	96·3	+1·2	73·6	−0·1	84·9	+0·6	22·7	100·3	5th, 11th & 16th.	68·1	21st	32·2
Coorg	Mercara	3,780·7	26·196	?	29·804	26·283	3rd	26·107	24th	·176	70·5	82·2	+1·0	65·5	+0·9	73·9	+1·0	16·7	88·7	12th	60·7	26th	28·0
Mysore	Bangalore	2,981·46	26·929	−·010	29·795	27·041	2nd	26·821	22nd	·220	77·7	94·3	+3·0	71·2	+2·1	82·8	+2·6	23·1	96·7	11th & 12th.	66·0	26th	30·7
Madras, East Coast (South).	Negapatam	15	29·791	−·012	29·737	29·928	2nd	29·658	23rd	·270	85·3	95·2	−0·5	80·3	+0·5	87·8	0	14·9	100·1	17th & 26th.	73·7	22nd	26·4
	Pamban	37	29·797	?	29·762	29·929	2nd	29·642	22nd	·287	85·5	91·1	?	80·4	?	85·7	?	10·7	93·7	7th	60·2	30th	33·5
	Cuddalore	12·44	29·808	?	29·752	29·931	3rd	29·677	22nd	·254	85·3	95·0	?	79·5	?	87·3	?	15·5	102·8	26th	74·2	23rd	28·6
	Trichinopoly	254·78	29·569	−·013	29·756	29·698	2nd	29·441	22nd	·257	86·3	102·0	+1·1	80·7	+2·7	91·4	+1·9	21·3	106·2	18th	73·4	22nd	32·8
	Madras	22	29·792	+·010	29·746	29·928	2nd	29·612	30th	·286	86·7	95·6	−1·6	79·5	−1·1	87·6	−1·4	16·1	104·0	28th & 31st.	76·5	25th	27·5
Madras, East Coast (Central).	Nellore	70·82	29·718	?	29·725	29·862	2nd	29·568	30th	·294	88·3	102·8	?	80·0	?	91·4	?	22·8	110·3	31st	77·1	1st, 10th & 17th	33·2
	Masulipatam	7·5	29·779	+·014	29·730	29·934	2nd	29·582	30th	·352	87·4	97·8	−1·0	81·1	−0·1	89·4	−0·6	16·8	110·7	31st	73·6	29th	37·1
Madras, Central	Cuddapah	433·36	29·379	?	29·746	29·511	2nd	29·285	22nd	·226	90·4	106·2	?	83·8	?	95·0	?	22·4	109·8	18th	77·9	29th	31·9
	Kurnool	923·45	28·881	?	29·733	28·987	3rd	28·763	22nd	·224	89·2	104·1	?	81·1	?	92·6	?	23·0	106·5	10th & 14th	73·0	19th	33·5
	Bellary	1,474·63	28·347	+·014	29·751	28·437	2nd	28·221	22nd	·216	86·4	103·0	+0·4	78·9	+1·7	90·9	+1·1	24·1	106·5	9th	71·0	23th	35·5
Madras, East Coast (North).	Rajahmundry	112	29·680	?	29·729	29·836	2nd	29·475	30th	·361	87·5	102·9	?	81·6	?	92·3	?	21·3	112·1	31st	79·1	25th	33·0
	Cocanada	26	29·768	?	29·731	29·923	2nd	29·557	30th	·366	86·2	96·3	?	82·1	?	89·2	?	14·2	103·9	31st	79·1	1st	24·8
	Vizagapatam	31	29·752	+·012	29·723	29·905	2nd	29·544	30th	·361	87·0	90·1	0	83·6	+0·8	86·9	+0·4	6·5	93·4	5th	81·4	10th	12·0
	Gopalpur	21·45	29·735	−·011	29·697	29·886	2nd	29·491	30th	·395	83·0	86·1	−1·4	80·3	−0·2	83·2	−0·8	5·8	89·2	31st	78·3	11th	10·9
Hill Stations		...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Beluchistan	Quetta	5,502·26	24·612	+·048	?	24·708	3rd	24·481	30th	·227	67·1	78·7	−3·8	52·2	+0·1	65·5	−1·9	26·5	90·1	31st	45·9	13th	44·2

* Mean of 22 days.

I —*continued.*

in India, Burma, &c., in May 1891 —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 31st May 1891.	Normal rainfall for period 1st March to 31st May.	Variation from normal of period.	Station.	Meteorological Province or District.
...	2	1	...	...	...	...	19	9	9	9	0	40	·534	0·8	0	...	...	0	0·49	−0·49	1·10	0·62	+0·48	Khandwa .	Central Provinces (West).
...	4	2	3	...	...	17	4	1	6	4	+50	52	·521*	1·1	0	...	...	0·13	0·54	−0·41	0·13	0·68	−0·55	Hoshangabad.	
1	3	2	2	2	5	3	4	9	7	7	0	34	·513	3·1	2	...	...	0·33	1·15	−0·82	1·63	1·96	−0·33	Nagpur.	
...	6	1	4	1	6	4	6	3	5	5	0	36	·494	2·9	1	...	...	0·49	1·23	−0·74	2·88	1·97	+0·91	Seoni .	Central Provinces (Central).
5	...	5	2	2	4	4	8	1	3	4	−25	38	·503	1·9	1	...	...	0·30	0·80	−0·50	0·51	1·25	−0·74	Jubbulpore.	
...	3	3	4	2	3	4	9	3	4	4	0	29	·401	0·8	1	...	...	0·15	0·65	−0·50	0·37	0·79	−0·42	Saugor.	
2	1	3	3	...	3	9	9	1	8	8	0	44	·584	3·8	4	...	...	1·65	1·15	+0·50	5·58	2·23	+3·35	Raipur .	Central Provinces (East).
4	...	...	1	3	1	...	9	13	6	8	−25	58	·724	3·8	1	...	...	1·08	1·30	−0·22	2·86	2·46	+0·40	Secunderabad	Hyderabad (South).
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2·28	5·97	−3·69	...	...	...	**West Coast.**	
...	8	2	1	1	1	4	6	8	11	10	+10	74	·865	4·6	0	...	...	0	0·97	−0·97	0·20	0·97	−0·77	Bombay .	Konkan.
...	9	1	...	...	...	2	5	14	12	11	+9	69	·842	1·2	0	...	...	0	1·57	−1·57	0·02	1·62	−1·60	Ratnagiri.	
1	3	1	1	...	...	...	6	19	13	?	?	75	·880	3·8	0	...	...	0	?	?	0·20	?	?	Mormugao.	
1	4	8	...	...	...	1	2	15	5	?	?	76	·822	3·3	0	...	...	10·04	3·70	−3·66	0·09	3·98	−3·89	Karwar.	
11	9	1	3	...	...	...	1	6	3	5	−40	78	·919	5·6	2	...	...	0·45	7·77	−7·32	1·25	8·38	−7·13	Mangalore .	Malabar.
16	7	...	...	...	...	...	...	8	10	?	?	77	·900	4·9	2	...	...	1·22	7·44	−6·22	6·49	10·74	4·25	Calicut.	
1	3	19	2	2	1	1	1	1	5	?	?	80	·909	5·7	12	...	...	11·97	14·36	−2·39	19·76	19·66	+0·10	Cochin.	
...	15	5	3	...	...	...	3	5	9	?	?	80	·881	7·1	16	...	...	16·28	?	?	23·29	?	?	Trivandrum.	
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2·10	3·06	−0·96	...	...	...	**South India.**	
10	2	2	1	6	...	2	...	8	3	4	−25	71	·855	5·5	0	...	...	0·14	3·58	−3·44	8·47	4·78	+3·69	Madura .	Madras, South
4	...	8	2	2	8	6	1	...	3	4	−25	69	·825	3·3	2	...	...	1·05	5·68	−4·63	2·67	8·08	−5·41	Salem .	Madras, South (Central).
...	3	1	4	5	11	7	...	...	4	5	−20	80	·845	4·7	3	...	..	1·72	2·81	−1·09	3·56	4·83	−1·27	Coimbatore.	
...	10	...	...	...	...	...	7	14	6	5	+20	85	·631	7·1	16	...	...	6·71	6·80	−0·09	11·86	9·95	+1·91	Mercara .	Coorg.
...	...	...	...	1	5	9	15	1	2	6	−67	69	·664	3·7	0	...	...	0·05	4·72	−4·67	1·67	6·02	−4·35	Bangalore	Mysore.
1	...	...	...	7	8	7	6	2	6	7	−14	74	·905	5·9	3	...	...	3·50	2·01	+1·49	3·50	2·78	+0·72	Negapatam	Madras, East Coast (South).
2	...	...	...	6	8	10	4	1	7	?	?	73	·900	4·6	3	...	...	2·06	?	?	?	?	?	Pamban.	
...	1	1	...	3	9	9	6	2	3	?	?	80	·984	2·9	2	...	...	1·90	?	?	2·13	?	?	Cuddalore.	
4	...	...	1	2	4	6	11	3	6	6	0	65	·811	6·1	2	...	...	0·58	3·28	−2·70	1·55	5·25	−3·70	Trichinopoly.	
...	2	1	...	1	15	7	5	...	8	9	−11	74	·946	6·8	2	...	...	0·49	1·50	−1·01	0·49	1·92	−1·43	Madras.	
2	...	...	...	19	3	...	5	2	9	?	?	70	·925	6·9	0	...	...	0	?	?	0·04	?	?	Nellore .	Madras, East Coast (Central).
3	...	1	1	3	14	6	2	1	4	9	−56	77	1·001	3·9	3	...	...	1·51	1·95	−0·44	2·17	2·11	+0·06	Masulipatam.	
...	...	2	1	8	8	8	3	1	?	?	?	50	·718	4·4	2	...	...	0·69	2·16	−1·47	1·21	2·69	−1·48	Cuddapah.	Madras (Central).
31	...	...	...	...	...	...	...	...	?	?	?	48	·664	3·0	3	...	...	1·22	1·07	+0·15	2·37	2·01	+0·36	Kurnool.	
14	...	...	...	...	...	1	3	13	7	8	−13	55	·690	2·9	3	...	...	2·59	1·86	+0·73	2·73	2·51	+0·22	Bellary.	
9	...	...	1	2	7	7	5	...	?	?	?	71	·943	5·9	1	...	...	0·22	?	?	0·28	?	?	Rajahmundry	Madras, East Coast (North).
...	...	3	2	1	...	15	6	4	7	?	?	71	·890	3·5	2	..	...	0·48	?	?	2·30	?	?	Cocanada.	
...	...	2	...	...	2	12	13	2	2	4	−50	69	·877	4·5	2	...	...	1·58	3·26	−1·68	2·36	3·71	−1·35	Vizagapatam.	
1	3	1	1	1	12	11	...	1	18	13	+38	86	·968	2·4	6	...	...	7·53	2·17	+5·36	10·64	3·44	+7·20	Gopalpur.	
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	**Hill Stations.**	
30	...	...	...	...	...	...	...	1	4	5	−20	50	·335	2·3	5	...	...	1·64	0·39	+1·25	3·10	3·54	−0·44	Quetta .	Beluchistan.

Table

Abstract of Observations taken at 8 A.M., at 158 Stations

Meteorological Province or District.	Station.	Height of Station 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.
Northern India	Murree	6,343·86	23·805	+·020	?	23·957	2nd	23·633	29th	·324	62·8	71·6	−4·0	55·7	−3·4	63·7	−3·7	15·9	82·6	31st	46·3	23rd	36·3
	Simla	7,274	23·033	+·035	?	23·152	3rd	22·903	30th	·249	60·9	70·8	−5·8	55·4	−1·9	63·1	−3·9	15·4	76·2	16th	43·5	24th	32·7
	Mussoorie	?	23·549	?	?	23·668	7th	23·428	30th	·240	64·9	77·1	+2·0	52·9	−4·6	65·0	−1·3	24·2	85·3	28th	41·0	24th & 25th.	44·3
	Ranikhet	6,068·75	24·036	0	?	24·143	2nd	23·886	30th	·257	68·8	77·1	+0·5	59·0	−0·3	68·1	+0·1	18·1	82·5	17th	51·0	24th	31·5
	Darjeeling	7,421·1	22·943	?	?	23·021	19th	22·794	30th	·227	55·9	61·6	−1·0	50·4	0	56·0	−0·5	11·2	65·6	28th	46·6	1st	19·0
	Kalimpong	?	?	?	?	?	?	?	?	?	64·7	73·1	?	61·5	?	67·3	?	11·6	76·7	24th	56·2	1st	20·5
Central India	Mount Abu	3,945	26·001	+·032	?	26·099	3rd	25·884	30th	·215	78·2	87·0	−2·1	70·9	−0·3	79·0	−1·2	16·1	92·7	30th	64·3	8th	28·4
	Pachmarhi	3,511	26·394	+·025	?	26·503	2nd	26·247	30th	·256	83·3	95·3	+0·8	75·5	+0·9	85·4	+0·9	19·8	99·2	9th	67·2	4th	32·0
South India	Wellington	6,200	24·243	+·020	?	24·341	2nd	24·147	22nd	·194	69·5	76·0	+0·5	57·2	−1·4	66·6	−0·5	18·8	79·2	14th	51·7	25th	27·5
Extra India		...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Persia	Meshed	?	?	?	?	?	?	?	?	?	62·2	74·9	?	57·0	?	66·0	?	17·9	89·0	30th & 31st.	47·0	2nd & 12th.	42·0
	Bushire	14	29·805	?	29·790	29·967	2nd	29·640	31st	·327	83·4	88·4	?	75·8	?	82·1	?	12·6	100·3	16th	67·1	2nd	33·2
Arabia	Baghdad	?	29·407	?	?	29·526	2nd	29·156	31st	·370	77·7	91·7	?	67·5	?	79·6	?	24·2	101·8	23rd	58·9	6th	42·9
	Aden	94·1	29·777†	?	29·802†	29·849	6th	29·646	30th	·203	86·1*	91·5*	?	81·7*	?	86·6*	?	9·8	95·8	17th	78·8	13th	17·0
Africa	Zanzibar	73	30·016†	?	30·016†	30·106	24th	29·885	11th	·221	77·1*	81·9*	?	74·6†	?	78·3*	?	7·3	84·9	17th	69·9	31st	15·0
Arabian Sea Islands.	Minicoy	10·5	29·892	?	29·827	29·978	18th	29·819	30th	·159	84·0	88·3	?	81·8	?	85·1	?	6·5	94·0	3rd	73·4	16th	20·6

* Mean of 29 days. † Mean of 30 days.

I —*concluded.*

in India, Burma, &c., in April 1891 —concluded.

WIND DIRECTION. Number of Winds from									WIND VELOCITY.			HYGROMETRY, 8 A.M.			RAINFALL.										
Calm.	N.	NE.	E.	SE.	S.	SW.	W.	NW.	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 March to 31st May 1891.	Normal rainfall for period, 1st March to 31st May.	Variation from normal of period.	STATION.	METEOROLOGICAL PROVINCE OR DISTRICT.
8	2	2	2	10	...	...	...	7	8	8	0	48	·271	4·3	7	...	...	2·99	3·41	−0·42	18·02	10·81	+7·21	Murree	NORTHERN INDIA.
3	1	4	3	8	4	5	2	1	?	3	?	53	·280	3·7	6	...	...	3·69	4·23	−0·54	7·52	9·03	−1·51	Simla.	
...	9	2	5	5	4	...	1	5	?	12	?	60	·371	2·1	6	...	...	2·42	?	?	5·62	?	?	Mussoorie	
15	...	...	2	2	1	7	2	2	4	3	+33	53	·371	2·5	5	...	...	2·60	2·76	−0·16	6·62	6·54	+0·08	Ranikhet.	
7	...	5	2	3	1	8	5	...	8	6	+33	90	·403	7·5	13	...	...	16·69	9·02	+7·67	21·13	15·60	+5·53	Darjeeling.	
4	2	1	1	3	2	4	6	8	?	?	?	87	·537	5·8	17	...	...	12·23	?	?	?	?	?	Kalimpong.	
2	6	3	...	...	...	5	10	5	8	9	−11	39	·372	1·0	1	...	...	0·11	0·89	−0·78	0·77	0·95	−0·18	Mount Abu	CENTRAL INDIA.
...	1	1	2	1	1	7	15	3	7	7	0	25	·288	2·5	0	...	...	0·09	0·76	−0·67	0·41	1·15	−0·74	Pachmarhi.	
21	6	1	1	1	1	...	...	...	3	3	0	06	·432	4·4	5	...	...	1·49	4·22	−2·73	9·29	8·46	+0·83	Wellington	SOUTH INDIA.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	**Extra India.**	
6	1	4	8	6	1	...	1	4	1	?	?	?	?	4·9	7	...	...	1·64	?	?	?	?	?	Meshed	PERSIA.
...	4	6	1	2	...	4	...	14	8	?	?	55	·625	?	?	...	...	?	0	?	0·24	1·46	−1·22	Bushire.	
...	10	7	2	6	2	...	1	3	?	?	?	52	·493	3·2	3	...	...	0·77		?	1·87	?	?	Baghdad	ARABIA.
10	...	7	7	2	1	1	2	...	11	11	0	75*	·932*	2·8†	0	...	...	0	0·14	−0·14	2·41	0·87	+1·54	Aden	
...	...	...	...	5	15	8	2	...	?	?	?	90†	·835†	5·8†	13	...	...	15·55	?	?	?	?	?	Zanzibar	AFRICA.
...	...	1	1	...	...	10	12	6	14	?	?	82	·952	6·2	12	...	...	10·87	?	?	?	?	?	Minicoy	ARABIAN SEA ISLANDS.

Table

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

Station.	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 to 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.
Murree	23·830	23·817	·014	23·814	+·031	?	72·1	55·7	16·4	84·9	46·5	38·4	66·5	67·9	63·3	−3·1	47·8	54·6	55·4	52·6
Chamba	26·815	26·754	·061	26·797	?	?	85·8	60·7	25·1	96·1	53·9	42·2	74·9	80·3	71·6	−2·6	55·5	62·2	63·3	60·4
Kailang	20·802	20·762	·041	20·794	+·048	?	59·2	35·7	23·5	68·1	29·0	39·1	51·1	54·1	45·9	−1·2	33·5	42·1	43·2	39·6
Simla	23·055	23·009	·046	23·023	+·022	?	71·7	55·3	16·0	78·8	43·2	35·6	64·7	68·0	63·4	−1·3	47·5	53·2	54·3	51·7
Peshawar	28·659	28·567	·092	28·606	+·055	29·690	93·2	68·0	25·2	108·5	60·2	48·3	85·5	90·0	80·1	−2·1	61·0	68·4	69·6	66·3
Lahore	·998	·905	·093	·945	+·027	·610	100·2	70·3	29·9	111·0	63·2	47·8	91·9	96·7	84·7	−1·7	62·8	69·7	70·3	67·6
Ludhiana	·873	·779	·094	·819	+·003	·586	100·9	73·2	27·8	111·1	64·2	46·9	92·7	97·5	86·5	−0·4	65·9	70·6	71·1	69·2
Mooltan	29·292	29·180	·112	29·230	+·039	·609	102·2	74·9	27·3	114·8	69·2	45·6	90·2	100·2	88·4	−1·5	65·5	73·4	77·1	72·0
Jacobabad	·526	·400	·126	·456	+·043	·596	108·2	77·2	30·9	119·2	70·9	48·3	97·0	105·1	92·2	−1·0	65·2	72·8	73·3	70·5
Hyderabad	·608	·495	·112	·551	+·027	·618	106·5	78·0	28·6	117·4	73·1	44·3	95·7	102·6	90·4	−0·5	69·3	73·0	73·8	72·0
Kurrachee	·717	·630	·086	·672	+·021	·674	93·0	78·1	14·9	103·9	73·3	30·6	89·3	89·5	83·7	−0·3	70·9	81·4	82·0	78·1
Jeypore	28·326	28·216	·110	28·270	+·024	·629	104·1	74·8	29·3	112·0	66·1	45·9	94·8	100·5	88·8	−1·4	63·0	71·8	71·5	68·8
Ajmere	·167	·063	·104	·113	+·031	·644	102·9	79·3	23·6	108·7	68·1	40·6	93·7	100·1	90·4	+0·9	70·1	74·3	75·6	73·3
Mount Abu	26·014	25·940	·075	25·976	+·035	?	87·1	70·9	16·3	92·6	64·0	28·6	81·6	85·6	78·6	−0·5	57·5	63·3	64·7	61·8
Chakrata	23·234	23·192	·042	23·204	+·003	?	73·1	54·1	19·0	78·9	43·7	35·2	68·1	68·2	62·8	−1·7	47·8	55·3	55·2	52·8
Ranikhet	24·050	·995	·055	24·011	−·005	?	77·4	59·0	18·3	82·3	51·2	31·1	71·9	73·1	67·5	−0·1	51·1	58·7	59·1	56·3
Pithoragarh	·719	24·655	·064	·675	+·040	?	80·2	58·9	21·3	84·6	52·0	32·6	72·6	75·6	68·8	−0·5	52·6	61·3	61·6	58·5
Dehra	27·525	27·437	·088	27·471	+·009	·623	94·2	68·1	26·0	100·0	60·3	39·7	85·7	90·9	80·6	−1·8	60·0	65·7	65·8	63·8
Roorkee	28·819	28·711	·109	28·759	+·011	·595	102·3	73·0	29·3	107·7	64·3	43·4	92·1	98·4	87·0	−0·6	63·0	70·4	70·6	68·0
Meerut	·977	·873	·104	·918	+·034	·609	101·3	72·3	29·0	108·2	65·0	43·2	93·1	97·5	86·2	−2·0	65·7	71·2	70·4	69·1
Agra	29·178	29·058	·120	29·109	+·029	·610	106·2	78·9	27·3	114·3	68·6	45·7	96·7	103·9	92·4	−0·1	64·4	72·1	73·7	70·1
Lucknow	·337	·216	·121	·273	−·001	·593	103·4	75·8	27·6	110·3	65·4	44·9	94·1	101·0	89·6	−1·1	66·3	72·5	73·1	70·6
Allahabad	·398	·271	·127	·335	+·009	·590	105·6	78·0	27·6	110·3	71·6	38·7	96·5	103·8	91·9	0	67·6	73·4	72·9	71·3
Ghazipur	·485	·364	·121	·424	+·010	·593	103·7	79·1	24·6	109·3	72·2	37·1	95·8	100·6	90·5	+1·0	70·1	77·0	77·0	74·7
Nowgong	28·964	28·845	·119	28·905	+·015	·597	105·4	77·9	27·5	112·4	70·0	42·4	97·3	103·2	91·5	−1·5	65·7	72·2	73·4	70·5
Sutna	·673	·549	·124	·611	+·009	·585	104·6	77·5	27·2	111·2	69·3	41·9	98·2	102·1	90·6	−0·4	63·6	71·9	71·6	69·0
Durbhunga	29·600	29·464	·136	29·530	+·024	·618	93·8	74·4	19·4	99·9	68·5	31·4	85·9	92·4	83·0	−1·5	71·7	76·6	77·1	75·1
Patna	·539	·407	·132	·472	+·002	·605	98·5	76·0	22·6	104·5	70·2	34·3	89·8	95·7	86·2	−1·0	71·1	76·2	75·8	74·4
Hazaribagh	27·743	27·657	·086	27·704	+·016	·635	100·9	75·0	25·9	104·4	70·7	33·7	93·7	95·1	86·4	+1·3	62·6	68·5	67·5	66·2
Darjeeling	22·965	22·893	·072	22·929	+·014	?	61·7	50·3	11·4	66·1	46·6	19·5	57·5	58·3	55·3	−0·6	48·7	55·9	56·1	53·6
Pedong	25·238	25·148	·091	25·189	−·006	?	72·0	59·1	12·7	76·2	53·8	22·4	67·3	64·8	64·6	−0·4	57·4	63·9	63·8	61·6
Berhampore	29·690	29·560	·131	29·628	+·024	·643	94·7	74·9	19·8	103·7	68·2	35·5	84·6	90·9	83·0	−3·2?	71·9	78·8	79·1	76·6
Burdwan	·661	·531	·130	·599	+·021	·644	96·7	77·5	19·2	104·9	70·4	34·5	86·4	94·1	85·6	−0·3	73·4	78·3	78·7	76·8
Calcutta (Alipore)	·736	·625	·111	·682	+·020	·648	93·8	77·6	16·2	99·3	71·2	28·1	88·5	90·6	85·3	+0·3	74·5	80·3	79·6	78·1
Calcutta (Chowringhee)	·741	?	?	?	?	?	95·3	77·6	17·8	101·0	70·8	30·2	89·9	?	86·4	?	75·6	81·8	?	?
Saugor Island	·744	·634	·110	·691	+·019	·659	92·2	81·6	10·5	95·8	74·8	21·0	88·6	88·6	85·7	+0·6	78·5	82·3	82·2	81·0
Dacca	·772	·654	·118	·715	+·020	·685	83·8	74·1	15·7	93·0	67·4	25·6	84·4	86·4	81·4	−1·3	71·3	78·9	80·1	76·8
Chittagong	·742	·648	·095	·696	+·022	·730	87·9	73·6	14·3	90·0	68·1	21·9	84·9	84·7	79·9	−1·2	72·2	78·5	78·9	76·5
Demagiri	Not recorded.						88·2	73·1	15·1	91·4	67·5	23·9	83·5	85·7	80·0	0	Not recorded.			
Tura							84·0	70·0	14·0	87·6	62·6	25·0	78·5	82·0	76·5	?	?	72·6	74·4	?
Dhubri	·691	·562	·129	·622	+·017	·692	82·2	71·2	11·0	87·5	66·3	21·2	76·4	81·1	75·0	−2·5	70·1	73·0	75·1	72·9
Sibsagar	·474	·345	·130	·409	−·020?	·700	83·1	70·3	12·8	92·2	63·1	29·1	77·7	81·7	75·6	−1·6	69·6	74·4	75·6	73·2

II.

at 89 Stations in India, Burma, &c., in May 1891.

Vapour Tension.					Humidity.					Cloud.				Wind Directions. Number of Winds from											Wind Steadiness.		Wind Velocity.		Station.
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.	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.	
·252	·307	·314	·291	+·030	59	48	48	52	+ 8	4·6	6·3	5·5	+1·2	5	2	2	6	24	6	3	3	11	S 40° E	S 18° E	29	13	177	193	Murree.
·381	·411	·387	·394	+·045	72	48	40	54	+ 8	5·1	7·7	6·4	+1·9	8	7	2	1	8	1	2	2	31	N 38° W	N 2° E	45	11	102	114	Chamba.
·174	·192	·187	·185	+·005	83	52	47	61	+ 4	4·1	6·7	5·4	−0·8	...	2	...	1	3	2	27	22	5	S 67° W	S 61° W	72	70	67	51	Kailang.
·253	·288	·281	·276	−·014	59	48	42	50	+ 2	4·8	6·2	5·5	+1·5	...	...	2	1	7	14	28	7	2	S 30° W	S 66° W	67	51	?	?	Simla.
·453	·485	·470	·469	+·042	67	43	37	49	+ 9	3·8	5·2	4·5	+1·6	8	11	8	6	1	2	2	11	13	N 36° W	N 25° E	26	25	95	117	Peshawar.
·475	·430	·390	·432	−·003	65	30	24	40	+ 7	3·2	4·4	3·8	+1·5	5	17	2	7	1	3	1	15	11	N 33° W	N 7° E	42	21	67	78	Lahore.
·543	·453	·408	·468	−·020	67	30	24	41	− 2	2·1	4·7	3·4	+1·2	12	13	1	4	3	6	...	15	8	N 50° W	N 25° E	29	25	61	54	Ludhiana.
·510	·598	·627	·578	+·008	60	43	33	45	+ 3	1·5	1·9	1·7	+0·5	16	...	15	...	5	...	18	...	8	N 52° W	S 35° W	9	35	42	66	Mooltan.
·465	·487	·396	·449	−·009	51	28	18	32	0	2·2	3·7	2·9	+1·7	15	2	2	7	15	9	3	1	8	S 39° E	S 61° E	26	17	84	110	Jacobabad.
·608	·501	·450	·520	−·115	63	30	22	39	− 6	4·7	6·0	5·4	+4·8	...	6	...	3	...	50	1	2	...	S 45° W	S 47° W	72	72	207	304	Hyderabad.
·684	·970	·996	·883	+·003	70	71	72	71	− 2	1·0	0·8	0·9	−1·1	...	...	...	...	...	...	22	31	9	S 80° W	S 60° W	87	85	395	420	Kurrachee.
·432	·480	·409	·440	+·012	50	30	21	34	+ 2	2·6	5·1	3·9	+0·2	2	2	3	3	3	4	11	24	10	S 85° W	N 45° W	52	50	113	159	Jeypore.
·626	·610	·580	·605	+·084	64	39	31	44	+ 6	1·1	2·5	1·8	+0·2	2	3	4	1	2	1	12	30	7	S 89° W	S 60° W	61	63	181	177	Ajmere.
·325	·375	·374	·358	+·016	44	35	31	37	+ 2	1·1	1·7	1·4	−0·5	...	3	2	1	...	1	15	26	14	N 87° W	S 62° W	71	70	180	226	Mount Abu.
·268	·307	·305	·294	+·019	65	46	45	52	+ 2	2·7	5·3	4·0	−0·3	2	...	3	13	3	4	14	22	1	S 51° W	S 63° W	32	29	147	146	Chakrata.
·236	·359	·359	·338	+·013	60	47	45	50	− 1	3·0	4·2	3·6	0	7	...	2	4	1	1	35	12	...	S 51° W	S 63° W	63	46	95	84	Ranikhet.
·337	·416	·394	·382	+·020	67	53	45	55	+ 2	2·7	6·4	4·6	+0·4	28	...	4	1	7	8	14	...	..	S 3° W	S 13° E	32	34	90	88	Pithoragarh.
·417	·374	·329	·373	?	61	32	24	39	?	1·9	4·0	3·0	?	...	5	3	4	2	5	4	20	19	N 68° W	S 76° W	50	17	55	59	Dehra.
·448	·454	·376	·426	+·011	56	31	22	36	+ 1	0·6	1·5	1·0	−0·8	12	1	...	...	9	5	...	31	4	S 75° W	S 68° W	45	6	76	88	Roorkee.
·549	·472	·381	·467	−·038	69	31	23	41	0	1·6	2·9	2·3	+0·4	8	3	1	1	3	2	7	21	16	N 80° W	N 32° W	55	24	56	63	Meerut.
·416	·460	·427	·434	−·010	43	27	21	30	− 1	1·9	2·9	2·4	+1·1	.	3	4	1	3	2	20	2	27	N 77° W	N 72° W	48	30	125	139	Agra.
·526	·516	·447	·496	−·053	59	35	25	40	− 1	2·5	2·5	2·5	+0·5	...	6	6	7	4	1	12	16	10	N 75° W	N 15° E	29	15	72	102	Lucknow.
·544	·519	·398	·487	−·045	57	32	20	36	− 2	2·3	3·3	2·8	+1·2	4	6	7	5	5	2	3	8	22	N 33° W	N 8° E	36	20	114	96	Allahabad.
·622	·680	·616	·640	+·075	63	42	33	46	+ 5	2·2	1·6	1·9	+0·5	8	3	7	7	6	2	8	11	10	N 67° W	N 10° W	13	9	60	83	Ghazipur.
·476	·456	·423	·452	+·043	51	27	21	33	+ 2	1·8	4·9	3·3	+1·0	2	10	2	9	...	...	1	33	5	N 62° W	N 70° W	50	44	65	81	Nowgong.
·420	·457	·397	·426	+·068	45	26	21	31	+ 4	0·7	2·6	1·7	−0·7	4	8	1	7	2	2	2	19	17	N 56° W	N 50° W	45	52	154	198	Sutna.
·754	·794	·720	·757	−·001	87	64	50	67	+ 7	2·2	1·9	2·1	0	...	1	12	27	17	2	1	2	...	S 83° E	S 86° E	72	59	161	144	Durbhunga.
·703	·727	·629	·686	+·002	78	53	40	57	+ 3	1·5	1·7	1·6	−1·2	4	2	9	36	2	1	...	3	5	N 76° E	N 54° E	62	38	154	115	Patna.
·419	·385	·333	·379	−·095	48	25	23	32	− 9	3·6	6·9	5·2	+1·7	...	8	1	2	4	10	8	11	18	N 83° W	S 77° W	39	15	234	210	Hazaribagh.
·330	·433	·432	·398	0	90	91	88	89	+ 2	8·4	8·5	8·5	+1·2	9	1	8	1	1	1	21	13	4	S 73° W	S 79° W	41	46	200	149	Darjeeling.
·456	·557	·548	·518	+·005	90	83	80	84	+ 2	6·0	8·9	7·8	+1·1	23	1	4	6	18	4	1	...	3	S 59° E	?	35	?	?	?	Pedong.
·748	·912	·839	·833	+·031	86	77	60	74	+ 2	5·4	5·8	5·6	+0·3	2	1	2	17	14	21	4	...	1	S 39° E	S 36° E	63	37	119	132	Berhampore.
·778	·866	·779	·808	−·008	82	69	50	67	+ 1	4·6	4·7	4·7	+0·7	7	...	2	3	10	28	8	2	2	S 4° E	S 9° E	61	52	130	131	Burdwan.
·818	·926	·866	·870	−·024	86	69	61	72	− 4	4·7	4·4	4·6	+0·1	...	1	3	1	10	26	19	...	2	S 6° W	S 11° E	68	66	175	174	Calcutta (Alipore).
·850	·981	?	?	?	91	70	?	?	?				Not r	ecor	ded.														Calcutta (Chowringhee).
·935	1·017	1·014	·988	+·003	87	75	75	79	− 1	6·4	7·0	6·7	+1·2	...	1	1	...	10	41	7	1	1	S 1° E	S 12° W	82	69	437	367	Saugor Island.
·736	·918	·946	·867	−·020	87	77	75	80	0	6·3	5·9	6·1	+0·8		1	3	8	15	30	3	1	1	S 21° E	S 19° E	68	60	174	150	Dacca.
·777	·891	·912	·859	−·004	93	74	77	82	+ 2	6·3	5·4	5·8	+0·7	...	...	2	4	11	16	23	3	1	S 10° W	S	63	38	?	153	Chittagong.
?	?	?	?	?	?	?	?	?	?	1·7	3·5	2·6	0	4	...	...	7	43	7	1	...	...	S 44° E	S 11° E	85	6	?	?	Demagiri.
?	·735	·768	?	?	?	76	70	?	?	5·4	5·3	5·4	+0·4	...	1	3	5	7	15	26	3	...	S 15° W	S 4° W	58	58	?	?	Tura.
·722	·771	·794	·766	−·019	93	85	76	85	+ 5	7·9	5·6	6·7	+2·1	9	2	17	17	7	2	5	3	...	N 82° W	N 70° E	45	21	179	168	Dhubri.
·715	·812	·806	·778	−·004	96	85	75	85	+ 2	8·3	7·7	8·0	+0·2		..	31	4	7	1	17	2	...	N 77° E	N 56° E	27	37	49	68	Sibsagar.

Table

Abstract of Observations recorded at 10 A.M. and 4 P.M., at 89 Stations

Station.	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 to 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.
Silchar	29·726	29·618	·108	29·672	+·020	29·728	87·3	71·2	16·1	93·7	65·5	28·2	81·0	82·4	77·8	−1·6	69·9	75·2	75·8	73·6
False Point	·750	·641	·109	·698	+·004	·660	89·9	79·4	10·5	91·7	71·3	20·4	88·0	87·4	83·7	0	77·2	81·7	81·6	80·2
Cuttack	·672	·555	·119	·623	+·012	·645	100·6	79·5	21·1	109·1	72·8	36·3	92·6	94·5	87·0	−0·6	76·7	79·9	79·9	78·9
Sambalpur	·253	·110	·143	·192	+·020	·587	104·0	80·5	23·5	109·7	73·4	36·3	94·5	101·7	91·4	−1·6	73·0	77·8	77·3	76·0
Raipur	28·770	28·625	·145	28·697	+·012	·579	105·2	80·5	24·7	113·0	72·0	41·0	96·7	103·1	92·6	−0·8	67·6	73·8	73·5	71·6
Khandwa	·731	·594	·136	·661	+·016	·630	106·3	81·7	24·6	111·7	71·9	39·8	96·5	104·5	93·5	+1·2	65·4	73·1	73·3	70·6
Hoshangabad	·744	·617	·127	·680	+·005	·629	107·2	79·6	27·6	111·8	71·7	40·1	97·4	105·4	92·9	−0·2	66·4	75·7	78·2	73·4
Saugor	27·996	27·871	·122	27·932	+·016	·592	105·7	78·0	27·6	110·4	71·6	38·8	97·2	103·0	88·0	−1·2	63·7	69·5	69·5	67·6
Jubbulpore	28·412	28·277	·136	28·344	+·009	·588	105·0	77·6	27·4	111·8	72·0	39·8	96·7	103·3	90·8	−0·1	66·4	72·4	73·0	70·6
Pachmarhi	26·406	26·310	·097	26·357	+·017	?	95·3	?	?	99·2	?	?	88·1	92·4	?	?	?	63·1	63·6	?
Seoni	27·751	27·637	·114	27·694	+·014	·603	103·7	76·6	27·1	108·1	70·1	38·0	94·3	99·0	89·2	+1·6	64·8	70·5	71·3	68·9
Nagpur	28·720	28·574	·146	28·646	+·011	·592	108·4	81·9	26·5	115·1	74·4	40·7	99·4	105·0	94·6	+0·5	65·8	73·4	74·3	71·1
Chanda	29·112	·966	·145	29·038	+·009	·596	109·8	81·7	28·1	114·8	75·4	39·4	98·8	106·9	95·3	+1·2	70·0	73·2	74·6	72·6
Sironcha	·329	29·164	·165	·246	−·059?	·577	107·5	84·5	23·0	114·1	77·4	36·7	93·5	104·8	95·6	+0·8	73·6	77·4	77·7	76·3
Chikalda	26·272	26·176	·096	26·223	+·002	?	94·5	74·8	19·7	98·6	71·1	27·5	85·8	92·5	84·3	+1·6	59·7	64·3	64·5	62·8
Buldana	27·672	27·551	·121	27·610	−·008	·614	102·1	78·7	23·3	105·8	75·4	30·4	92·6	99·1	89·9	+1·3	63·7	68·0	66·8	66·7
Akola	28·842	28·697	·145	28·769	+·009	·623	108·1	81·2	26·9	111·6	74·8	36·8	97·5	106·5	94·6	+1·0	63·9	71·0	71·2	68·7
Makhla			Not recorded.				99·5	75·5	24·0	103·6	70·5	33·1	89·5	96·1	87·0	+0·8	63·4	67·9	68·6	66·6
Deesa	29·318	29·192	·126	29·254	+·024	·661	107·7	78·9	28·8	113·3	74·3	39·0	95·2	106·0	92·7	+1·7	69·3	72·8	72·9	71·8
Bombay	·831	·725	·106	·776	+·010	·753	89·9	80·1	9·8	91·4	77·0	14·4	86·0	86·7	84·1	−0·6	75·8	78·0	78·6	77·5
Poona	28·010	27·884	·126	27·954	+·009	·703	101·0	70·7	30·3	105·3	63·8	41·5	90·1	96·1	84·8	+0·5	64·6	68·6	68·9	67·4
Sholapur	·234	28·077	·157	28·157	+·006	·648	106·2	76·7	29·5	110·2	69·8	40·4	94·1	103·3	90·3	+1·2	67·4	72·5	74·6	71·5
Ratnagiri	29·749	29·649	·100	29·696	+·008	·742	90·9	78·4	12·4	92·6	75·0	17·6	88·8	88·1	83·8	−0·6	72·1	78·0	78·2	76·1
Karwar	·819	·728	·091	·771	−·001	·747	89·9	81·3	8·6	92·3	78·2	14·1	86·7	87·4	84·9	+1·2	76·8	78·1	78·8	77·9
Belgaum	27·338	27·221	·117	27·283	−·009	·695	95·0	68·4	26·6	100·0	63·6	36·4	86·3	88·0	78·7	+0·9	65·3	69·1	72·3	68·9
Secunderabad	28·020	·894	·126	·958	0	·634	104·0	79·3	24·7	108·7	75·6	33·1	94·0	98·9	90·0	+0·8	72·0	79·8	80·5	77·4
Vizagapatam	29·763	29·652	·111	29·707	+·018	·675	90·2	83·7	6·5	93·5	81·5	12·0	89·8	89·3	86·4	−1·6	75·3	79·2	80·5	78·3
Bellary	28·341	28·204	·137	28·275	−·002	·656	102·9	78·8	24·1	106·4	70·8	35·6	92·5	99·1	89·5	+0·8	69·8	75·2	75·3	73·4
Madras*	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Salem	28·922	28·769	·153	28·859	−·021	·718	101·5	79·2	22·3	106·0	74·0	32·0	90·2	98·6	88·3	+3·8	75·5	78·0	79·0	77·5
Mercara	26·210	26·127	·083	26·168	−·001	·783	81·7	65·9	15·8	88·8	60·7	28·1	74·7	73·8	71·5	−0·3	63·6	68·9	69·0	67·1
Trichinopoly	29·577	29·429	·148	29·516	−·021	·697	102·2	80·7	21·5	106·4	73·3	33·1	91·2	99·5	89·4	+2·3	76·1	77·7	78·6	77·5
Cochin	·873	·773	·100	·821	−·013	·759	90·2	78·2	12·0	93·3	74·2	19·1	86·7	87·9	83·5	+0·9	75·9	79·9	80·6	78·8
Wellington	24·251	24·177	·074	24·214	+·012	?	76·2	57·2	19·0	79·5	51·8	27·7	72·2	70·5	66·6	+0·9	54·6	61·7	61·7	59·3
Akyab	29·830	29·721	·109	29·780	+·018	·742	91·1	80·5	10·6	94·1	73·3	20·8	87·0	88·1	85·0	+1·8	74·8	80·0	80·4	78·4
Diamond Island	·836	·731	·105	·782	+·011	·758	90·7	76·5	14·2	93·1	72·1	21·0	87·0	86·4	82·2	−0·9	74·8	79·5	79·1	77·8
Rangoon	·805	·667	·138	·740	−·019	·718	?	78·4	24·6	?	73·9	?	89·1	92·4	?	?	75·6	78·8	79·9	78·1
Mergui	·795	·676	·119	·733	−·016	·760	93·0	71·9	21·1	98·1	69·5	28·6	87·7	89·5	81·6	+0·8	70·3	79·9	80·8	77·0
Coco's Island	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Port Blair	·815	·718	·097	·765	+·012	·756	92·9	79·5	13·4	97·6	72·6	25·0	87·9	87·6	84·6	+2·3	76·4	81·4	81·1	79·6
Quetta	24·619	24·552	·067	24·576	+·043	?	79·6	52·2	27·3	92·4	46·1	46·3	73·2	76·3	65·5	−1·2	48·8	56·8	57·2	54·2
Leh	19·717	19·631	·086	19·686	+·003	?	64·1	37·6	26·5	70·9	30·3	40·6	54·3	59·0	49·9	+2·4	31·7	39·7	42·9	38·1
Katmandu			Not recorded.				87·8	58·5	28·6	92·8	53·1	39·7	74·4	77·6	70·3	0	56·5	64·0	65·5	62·0
Aminidivi	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Minicoy	29·905	29·820	·084	29·861	?	·796	88·1	81·8	6·3	94·0	73·4	20·6	86·1	85·5	·84·2	?	78·0	80·4	80·1	79·5
Aden	·789	·671	·119	·730	+·009	·753	91·4	81·9	9·5	94·5	78·8	15·7	87·8	89·0	86·1	+0·2	76·3	79·9	79·1	78·5
Zanzibar	30·028	·924	·104	·976	?	·976	82·5	74·7	7·8	84·9	71·0	13·9	78·4	80·8	75·3	?	72·7	75·6	75·1	74·4

II —*concluded.*

in India, Burma, &c., in May 1891 —concluded.

Vapour Tension.					Humidity.					Cloud.				Wind Directions. Number of Winds from											Wind Steadiness.		Wind Velocity.		Station.
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 Mean.	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.	
·717	·803	·809	·776	—·016	93	76	74	81	+1	7·2	7·7	7·4	+1·2	34	...	7	9	3	2	1	5	1	N 86° E	N 75° E	15	10	31	80	Silchar.
·911	1·000	1 004	·971	+·028	90	76	77	81	—2	5·1	6·0	5·6	+1·2	...	...	...	5	5	42	9	...	1	S 2° E	S 31° W	82	71	362	322	False Point.
·885	·854	·836	·862	+·033	88	57	54	67	+3	3·7	6·9	5·3	+1·3	...	1	...	2	10	23	19	5	1	S 14° W	S 5° W	69	61	113	125	Cuttack.
·715	·729	·613	·686	+·002	69	47	32	49	+2	3·4	4·2	3·8	+1·1	...	9	4	3	2	5	12	19	8	N 81° W	S 62° W	42	37	93	78	Sambalpur.
·507	·529	·429	·489	+·012	49	34	21	35	+1	3·6	6·7	5·1	+1·8	2	2	6	5	2	3	15	20	7	S 81° W	N 78° W	40	39	183	185	Raipur.
·429	·527	·431	·462	—·023	39	30	19	30	—4	0·6	2·7	1·6	—0·7	...	6	6	2	1	...	4	34	9	N 70° W	N 61° W	63	69	239	221	Khandwa.
·488	·619	·625	·577	+·129	48	35	28	37	+6	1·1	3·7	2·4	—0·1	3	2	7	2	...	...	23	15	10	S 86° W	W	52	54	136	91	Hoshangabad.
·415	·376	·305	·366	+·001	44	22	15	27	—1	1·9	2·3	2·2	+0·3	...	7	7	1	3	2	9	13	18	N 59° W	N 87° W	47	60	96	105	Saugor.
·516	·496	·435	·482	+·077	54	29	21	35	+5	1·3	3·5	2·4	—0·8	3	1	5	2	1	6	6	26	12	N 86° W	N 62° W	53	44	72	105	Jubbulpore.
?	·291	·256	?	?	?	22	17	?	?	2·6	4·6	3·6	+0·8	3	5	3	1	2	4	14	22	8	S 86° W	N 55° W	53	62	162	164	Pachmarhi.
·475	·452	·422	·449	+·014	51	28	23	34	0	2·7	4·7	3·7	+0·3	1	7	...	6	1	7	12	20	8	S 83° W	N 58° W	45	39	118	111	Seoni.
·433	·498	·462	·464	+·033	41	27	21	29	0	1·9	5·1	3·5	—0·4	...	6	9	5	1	5	12	11	13	N 66° W	N 41° W	29	44	Imperfect.	168	Nagpur.
·578	·470	·421	·490	+·002	54	26	18	33	+1	2·0	4·5	3·2	—0·4	2	2	1	3	13	5	6	8	22	S 89° W	N 76° W	24	31	66	118	Chanda.
·687	·728	·589	·668	+·063	59	47	27	44	+3	3·4	5·1	4·2	+1·4	23	2	1	1	7	13	6	3	6	S 17° W	S 30° W	26	19	64	110	Sironcha.
·339	·356	·284	·326	—·045	39	29	19	29	—6	3·2	5·6	4·4	+1·7	8	16	...	...	1	1	1	14	21	N 45° W	N 38° W	64	65	225	222	Chikalda.
·401	·380	·257	·346	—·104	41	25	14	27	—9	2·2	3·1	2·6	—0·2	7	18	...	...	...	...	3	5	29	N 37° W	N 53° W	74	51	243	283	Buldana.
·366	·407	·289	·354	—·047	34	23	13	23	—4	4·1	5·3	4·7	+2·5	1	3	1	...	...	...	2	5	50	N 48° W	N 51° W	90	72	227	203	Akola.
?	?	?	?	?	?	?	?	?	?	3·0	5·8	4·4	+0·7	...	5	1	...	...	...	18	...	38	N 64° W	N 78° W	70	43	?	?	Makhla.
·598	·512	·369	·493	—·094	60	32	16	36	—4	2·0	2·8	2·4	+0·9	...	21	4	3	1	2	7	7	11	N 29° W	S 55° W	48	76	281	321	Deesa.
·835	·855	·867	·852	—·029	81	69	68	73	—1	3·3	2·1	2·7	—1·3	...	...	...	2	...	...	4	27	29	N 70° W	N 82° W	83	67	268	248	Bombay.
·541	·436	·372	·450	—·062	71	31	23	42	—2	2·7	3·9	3·3	+0·2	4	1	1	...	2	1	...	20	33	N 61° W	N 55° W	76	66	301	337	Poona.
·560	·530	·501	·530	+·072	61	33	24	39	+3	3·7	6·4	5·0	+1·0	...	10	2	...	3	...	6	17	24	N 57° W	N 41° W	66	46	228	241	Sholapur.
·709	·813	·830	·784	—·042	72	60	62	65	—4	1·3	1·1	1·2	—0·6	...	24	...	...	...	...	2	7	29	N 34° W	N 73° W	84	64	286	265	Ratnagiri.
·862	·848	·872	·861	+·008	81	67	67	72	—2	1·8	1·7	1·7	—1·5	...	...	...	...	...	...	6	10	46	N 59° W	N 69° W	89	81	115	?	Karwar.
·588	·498	·598	·561	—·035	84	41	46	57	—3	2·9	4·1	3·5	—0·1	...	8	5	5	...	1	12	21	10	N 72° W	S 88° W	48	73	373	435	Belgaum.
·694	·842	·812	·783	+·270	69	53	44	55	+16	3·2	5·3	4·2	+1·4	7	1	2	5	2	6	6	15	18	N 82° W	N 76° W	40	34	146	182	Secunderabad.
·761	·861	·925	·849	—·056	66	61	67	65	—3	4·1	5·6	4·9	+0·7	...	2	3	1	2	17	23	11	3	S 41° W	S 41° W	61	60	56	88	Vizagapatam.
·621	·660	·577	·619	+·056	63	43	31	46	+3	3·0	6·8	4·9	+0·1	36	1	...	...	2	...	...	7	16	N 57° W	N 76° W	32	52	167	200	Bellary.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	Madras.*
·834	·797	·728	·786	+·018	84	56	41	60	—5	4·2	6·0	5·1	+0·5	...	1	14	8	6	20	7	3	3	S 37° E	S 49° W	34	62	77	101	Salem.
·566	·641	·657	·621	+·006	89	75	79	81	+1	6·1	8·6	7·3	+0·5	...	3	3	...	1	1	5	27	22	N 71° W	N 68° W	74	65	150	119	Mercara.
·843	·767	·698	·769	+·027	79	53	38	57	0	4·6	5·4	5·0	—0·6	4	1	...	4	15	6	11	15	6	S 33° W	S 80° W	37	61	143	143	Trichinopoly.
·869	·934	·945	·916	+·023	90	73	72	78	—3	4·8	4·8	·8	—0·9	1	6	4	...	...	1	1	18	31	N 52° W	W	77	49	124	?	Cochin.
·404	·442	·460	·435	—·009	86	56	62	68	—2	4·8	6·4	5·6	—0·1	6	12	3	3	23	10	1	2	2	S 57° E	N 88° E	34	24	62	70	Wellington.
·789	·935	·938	·887	+·004	75	74	71	73	—4	5·5	4·4	4·9	—0·4	0	3	6	2	6	20	10	14	1	S 25° W	S 33° W	42	31	83	87	Akyab.
·845	·910	·900	·885	—·013	93	71	72	78	+6	4·8	4·7	4·8	—0·6	1	6	...	1	6	10	7	11	20	N 88° W	S 76° W	40	45	175	165	Diamond Island.
·850	·849	·852	·850	—·018	87	63	58	69	—7	3·5	5·1	4·3	—2·4	2	...	1	4	18	23	12	2	...	S 37° W	S 17° W	68	56	?	121	Rangoon.
·732	·919	·939	·863	—·019	92	71	68	77	—6	6·7	7·2	7·0	—0·6	...	17	2	1	2	4	16	...	20	N 54° W	S 68° W	43	34	67	49	Mergui.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	Coco's Island.
·873	·990	·975	·946	+·002	86	74	75	78	—5	5·2	6·6	5·9	—0·4	1	...	5	6	25	11	6	5	2	S 30° E	S 34° W	52	48	150	165	Port Blair.
·308	·275	·252	·278	—·011	78	35	31	48	+5	3·1	4·6	3·8	+2·9	24	4	...	1	...	2	2	14	15	N 63° W	N 69° W	43	51	94	110	Quetta.
·131	·122	·142	·132	+·009	58	31	29	39	—1	5·6	7·1	6·4	0	2	4	5	3	1	5	20	11	11	S 80° W	S 72° W	42	25	34	75	Leh.
·455	·477	·490	·484	—·001	91	57	54	69	+1	5·5	7·2	6·3	+1·0	3	...	1	11	4	1	7	29	6	S 89° W	S 88° W	39	67	41	?	Katmandu.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	Aminidivi.
·910	·960	·957	·943	?	84	77	78	80	?	5·5	6·3	5·9	?	...	2	2	2	...	1	18	20	13	S 88° W	?	61	?	336	?	Minicoy.
·835	·918	·867	·873	+·018	77	70	64	70	+1	2·3	1·0	1·7	—0·2	5	...	11	17	5	17	3	1	1	S 60° E	S 67° E	45	40	255	254	Aden
·777	·850	·797	·808	?	90	88	76	85	?	6·4	5·8	6·2	...	...	...	1	2	19	23	8	1	...	S 13° E	S 14° W	68	72	?	182	Zanzibar.

GOVERNMENT OF INDIA CENTRAL PRINTING OFFICE.—No. 50 METEO.—20-11-91.—400.

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.

Reg. No. 409, Wr., I.—Oct 91.—415.

Litho., 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.

Reg. No. 462, Wr., I.—Oct 91.—415.

Litho., S. I. O., Calcutta.

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

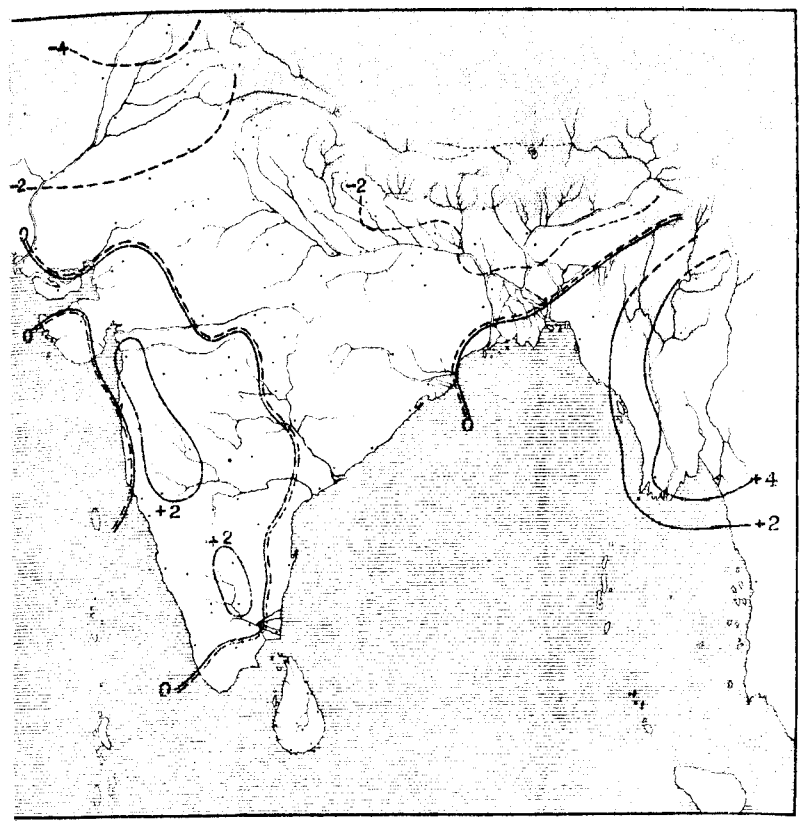
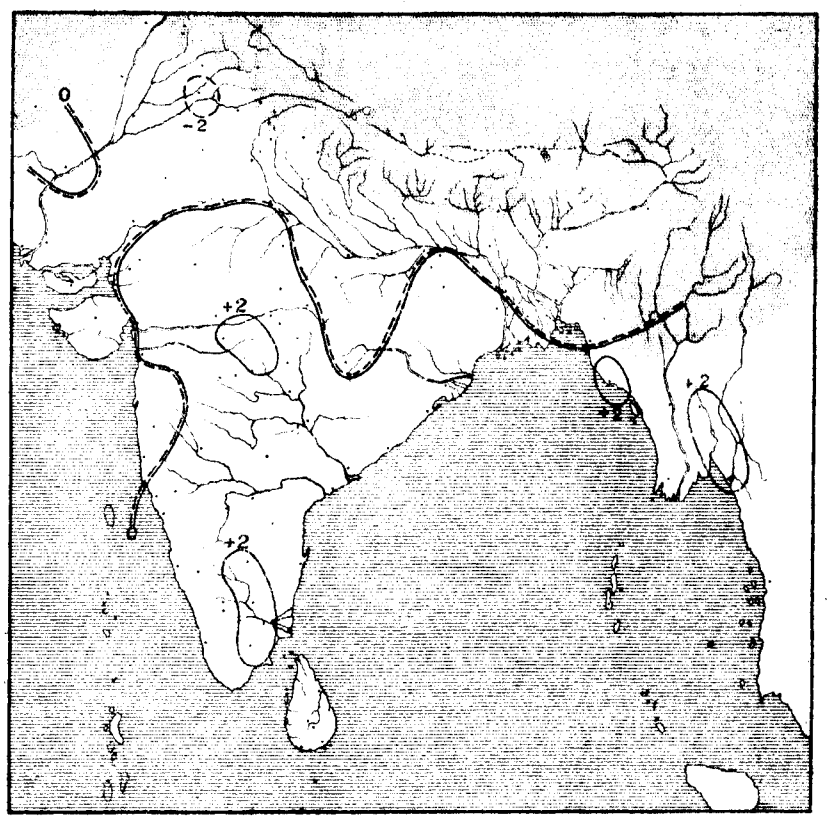


CHART SHEWING THE VARIATION OF THE MEAN MINIMUM TEMPERATURE OF THE MONTH FROM THE NORMAL.



Explanation.

Continuous lines indicate that the mean maximum of the month was in excess by the 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 the month was in excess by the 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.

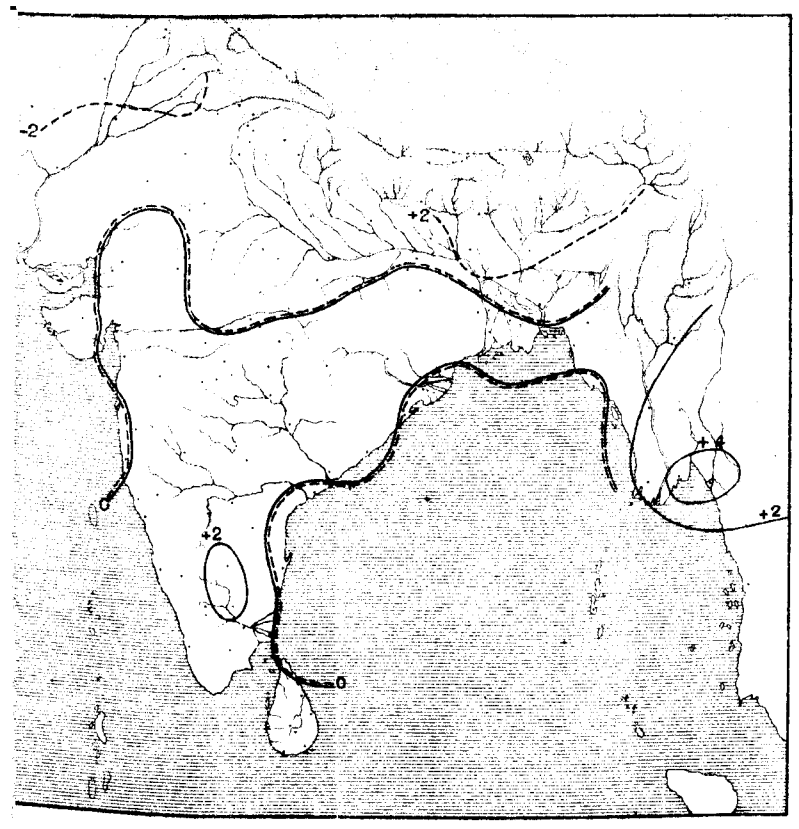
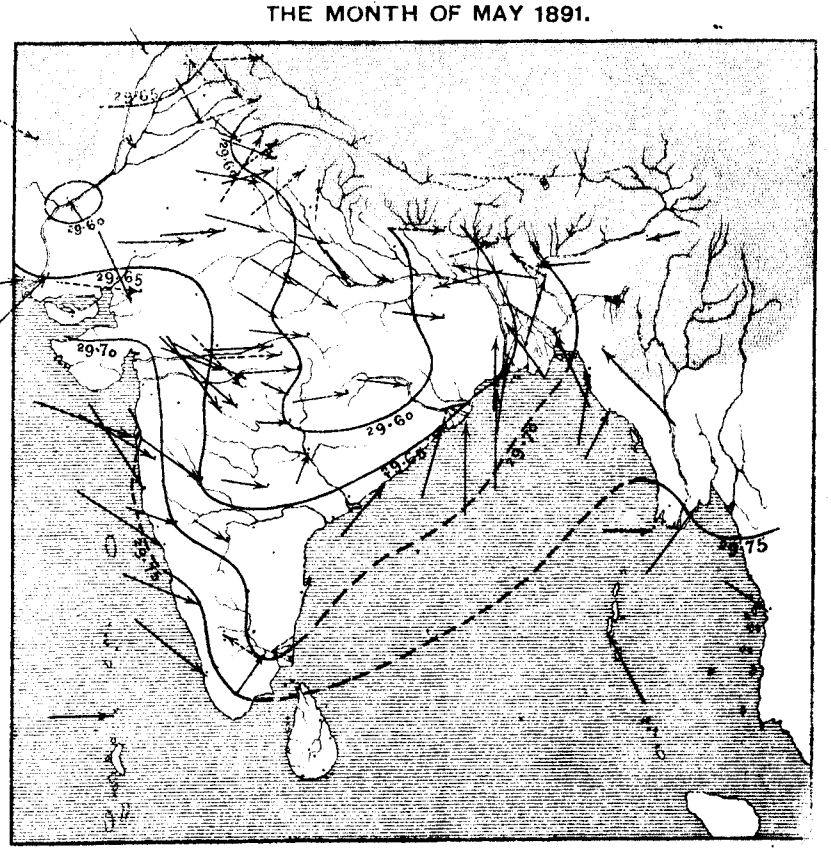


CHART SHEWING THE MEAN DISTRIBUTION OF PRESSURE AND THE RESULTANT WIND DIRECTIONS IN THE MONTH OF MAY 1891.



Explanation.

Continuous lines indicate that the mean daily temperature of the month was in excess by the 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.

Reg. No. 462, Wr., I.—Oct. 91.—415.

Litho., S. I. O., 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. 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. 162, Wr., I.—Oct. 91.—415.

Litho., 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 51 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 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
3. Central do.
4. Upper do.
5. Arakan
6. Eastern Bengal
7. Assam (Surma)
8. Do. (Brahmaputra)
9. Deltaic Bengal
10. Central do.
11. North do.
12. Orissa
13. Chota Nagpore
14. Behar (South)
15. Do. (North)
16. North Western Provinces (East)
17. Oudh (South)
18. Do. (North)
19. North Western Provinces (Central)
20. Do. do. (West)
21. Do. do. (Submontane)
22. Punjab (South)
23. Do. (Central)
24. Do. (Submontane)
25. Do. (Hill Districts)
26. Do. (North West)
27. Punjab (West)
28. Malabar
29. Madras (South Central)
30. Coorg
31. Mysore
32. Konkan
33. Bombay Deccan
34. Hyderabad (North)
35. Khandeish
36. Berar
37. Central Provinces (West)
38. Do. (Central)
39. Do. (East)
40. Guzerat
41. Kattiawar
42. Sind
43. Central India (East)
44. Rajputana (East) Central India (West)
45. Rajputana (West))
46. East Coast (North)
46(a.) Do. do. (a)
47. Hyderabad (South)
48. Madras (Central)
49. East Coast (Central)
50. East Coast (South)
51. Madras (South)

GOVERNMENT OF INDIA.

METEOROLOGICAL DEPARTMENT.

MONTHLY WEATHER REVIEW,

PUBLISHED BY ORDER OF

THE GOVERNMENT OF INDIA.

CALCUTTA, JUNE, 1891.

INTRODUCTION.

THIS review of the weather in India during the month of June 1891 is based on observations taken daily at 8 A.M. at 159 stations, and on additional observations taken at 10 A.M. and 4 P.M. at 89 stations. The rainfall summary is based on the rainfall data of the meteorological observatories and of the rainfall telegrams received during the month from District Officers throughout India. The meteorological data of the Bay of Bengal and the Arabian Sea, which are collected at the ports of Calcutta and Bombay so far as is at present possible in discussing the weather of India, are also given.

Summary of the chief features of the weather in India during the month of June 1891.

The most important feature of the meteorology of the month (and also of the year) is the advance of the south-west monsoon currents over the Arabian Sea and the Bay of Bengal into India and their establishment in the latter area. Brief and partial advances of these currents occur occasionally in the month of May, but it is usually not until the last week of May, or the first and second weeks of June, that the great advance occurs which culminates in the establishment of "the rainy season" in Central and Northern India.

Judging solely from the land observations, there are very considerable differences from year to year in the character of the advance of the monsoon currents over the Indian Seas towards Northern India. In one year (for example 1889) the Bombay branch of monsoon current advances northwards along the West Coast from Malabar to Bombay or Surat at a fairly uniform rate of progression, whilst in another year (for example 1890) it appears to march westwards across the centre ofthe Arabian Sea and set in over the greater part of the West Coast almost simultaneously. The manner of advance of the currents over India depends very largely upon the pressure and other weather conditions prevailing at the time in India, and hence differs largely from one year to another.

Temperature is usually excessive in the whole of Upper and Central India at the commencement of the month. The advance of the monsoon currents over the interior increases humidity rapidly, and brings up much cloud and is followed by frequent rain showers. Hence temperature falls rapidly with their advance, and the area of excessive temperature retreats north-westward to Sind, the West Punjab and North-West Rajputana. The highest maximum temperatures of the year are hence occasionally recorded in that area in June or July.

The change from great heat and dryness of the air to moderate heat, excessive humidity and frequent rain

showers is usually not completed over Northern India until the third or fourth week of June, by which time the monsoon currents usually penetrate into the East and North Punjab.

There is always much disturbance and squally weather in the front of the advancing monsoon. This squally weather, if conditions are favourable, may develop into a cyclonic storm. Hence cyclonic storms frequently accompany the great advance of the monsoon currents in the Arabian Sea and Bay of Bengal.

After the south-west monsoon currents are fully established in Northern India small cyclonic storms form at short intervals in the Bay of Bengal or in Bengal. These storms form one of the more important and characteristic features of the rains. In June and July they usually march in a west or west-north-west direction along the trough of low pressure which generally stretches from Orissa to Sind or the south-west Punjab, and which in its eastern half separates the area in which easterly winds from the Bay of Bengal prevail from that in which westerly winds from the Bombay Coast obtain. These storms not only give heavy rain to the areas they traverse, but draw rain away for the time being from other districts to concentrate it in the comparatively narrow belt traversed by them. They are hence one of the more important of the causes of the irregular distribution of the monsoon rainfall.

The chief feature of the meteorology of India for the month of June 1891 was the prolonged delay in the establishment of the monsoon currents in Northern and Central India. This very largely modified the temperature, humidity and other meteorological conditions of the month.

The distribution of pressure was very abnormal at the beginning of the month. There was a considerable deficiency in North-Eastern India and Burma and a large excess in North-Western and Western India, the excess being greatest in North Bombay, Guzerat and Kathiawar. This peculiar distribution of pressure had been a prominent feature of the meteorology of the previous three months, and was, in part at least, due to the excessive snowfall in the North-West Himalayas and Afghan mountains during the winter of 1890-91.

The pressure conditions in North-Eastern India were undoubtedly favourable to an early advance of the south-west monsoon winds up the Bay. The first great advance occurred in the fourth week of May. The rains commenced on the 22nd in the Andamans and on the 22nd or 23rd in Lower Burma. These dates hence mark the commencement of the south-west monsoon proper in these areas. The humid winds continued to advance northwards up the Bay in the last week of May, and began to give rain to Bengal on the 30th and 31st of May. No further large extension occurred until the 3rd of June, when humid winds extended rapidly westwards up the Gangetic plain. The 3rd and 4th of June, it may be noted, were the hottest days of the year in Upper India. The following were the highest maximum temperatures registered:—

District.	Station.	Maximum temperature of 24 hours ending 8 A.M.	
		June 3rd.	June 4th.
		°	°
Sind	Jacobabad	122·0	122·0
Punjab	D. I. Khan	119·5	119·5
"	Mooltan	118·8	119·3
"	Montgomery	119·4	119·4
"	Khushab	117·1	117·1

The hottest day usually occurs on the 24th and 25th of May. It was hence at least ten days later than usual in 1891. Behar, Chutia Nagpur, the North-Western Provinces and the south-east districts of the Punjab received moderate and fairly general rain from the 4th to the 7th, and some light local showers from the 7th to the 10th, during which the easterly winds gradually fell off in strength and withdrew eastwards down the Gangetic plain into the Bay of Bengal and were replaced in that area by westerly winds. Bengal, Assam and Burma received steady general rain during this period The most remarkable feature of this influx of aqueous vapour was the excessive rainfall in the Gorakhpur district. It received an average of over 12 inches, whilst all other neighbouring districts, with one or two exceptions, obtained averages of less than one inch. The changes of pressure at this period intensified the high pressure conditions in North-Western India and the deficiency of pressure in North-Eastern India and Assam. One important effect of these pressure changes was to transfer the low pressure area or trough northwards to the foot of the hills for some days and to give abnormally strong and intensely dry land westerly winds across Northern India. These were most violent in Rajputana, Central India and the Central Provinces, where they blew steadily almost with the force of a gale from the 10th to the 18th. These westerly winds extended eastwards into Bengal, and the humid monsoon current from the Bay was for some time confined to Assam, the eastern districts of Bengal, Burma and the Bay. Whilst these changes were in progress in Bengal, the weather was very squally off the Burma and Arakan Coasts for three or four days, and some excessive downpours were received in the Akyab, Sandoway, Bassein and Thongwa districts of Burma. Thigwin in Bassein received 35 inches in 48 hours. Diamond Island had very severe rain squalls on the 14th, and Port Blair on the 15th. It would thus appear that there was a kind of wave of squally weather transmitted southwards from the 12th to the 15th. Winds then decreased in force in the Bay, and fine weather with moderate winds obtained until the 21st or 22nd. During this period Burma, Assam, and East Bengal continued to receive frequent showers.

South Madras and Mysore as well as the Malabar coast districts received almost daily rain during the first ten days of the month. The feeble humid current from the Arabian Sea then decreased in strength and gave rain only to Travancore, Cochin and Coorg until the 21st or 22nd. This period from the 11th to the 22nd was characterized by dry and almost cloudless weather over the whole of India, except Burma, Assam, East Bengal and Malabar. Temperature hence increased, and was excessive over the whole of the interior of India. The excess was most marked in those districts which, as a rule, receive more or less general and heavy monsoon rain in June, *viz.*, the Central Provinces, Berar, Central India, Behar, and the eastern districts of the North-Western Provinces. The following gives the variations of the mean temperatures of the day from the normal in these provinces from the 18th to the 24th, when the heat was most excessive :—

Variation of Mean Temperature from Normal.

	18	19	20	21	22	23	24
Berar	+8·4	+8·7	+11·9	+11·2	+ 8·8	+ 8·8	+10·8
Central Provinces	+6·7	+8·9	+11·4	+12·1	+11·6	+10·9	+11·9
Central India	+3·3	+4·2	+ 6·3	+ 6·9	+ 6·9	+ 6·2	+ 8·0
Behar	+5·1	+5·5	+ 6·6	+ 7·6	+ 5·7	+ 5·8	+ 5·1
North-Western Provinces, East	+2·8	+3·7	+ 4·6	+ 5·3	+ 4·1	+ 3·7	+ 4·1

During this period of intense heat the pressure conditions gradually changed so as to give a distribution differing little from the normal on the 21st and 22nd. Winds were increasing both in the Arabian Sea and Bay of Bengal. On the 21st rain extended along the west coast to Bombay, and thence very slowly advanced into the interior. Berar received its first monsoon showers on the 23rd and 24th, and the Central Provinces on the 26th. Although the monsoon rainfall was for some time afterwards very deficient, these dates form the commencement of the south-west monsoon in these districts. The Bay of Bengal current increased considerably in force at the head of the Bay on the 25th and 26th. Bengal received general rain from the 28th to the end of the month, and Behar, Chutia Nagpur and the eastern districts of the North-Western Provinces on the 29th and 30th. The temperature fell very rapidly in those districts which received rain during the last week of the month.

In consequence of the protracted delay in the establishment of the monsoon currents, the rainfall of the month was almost, without exception, in defect. The defect was very large in those districts, including Bombay, the Central Provinces, Behar, Chutia Nagpur and the eastern districts of the North-Western Provinces, in which the south-west monsoon rains usually commence before the middle of the month. The deficiency was less marked in the Punjab, Rajputana and the western districts of the North-Western Provinces, where the rains, as a rule, do not set in until the fourth week of June or the beginning of July. There was also a moderate deficiency over Assam and Bengal. In the latter province the deficiency was least marked in the eastern districts and increased in amount relatively to the normal westwards. Burma and some parts of Southern India were the only areas in which the rainfall of the month was in excess. The following table gives a brief statement of the average rainfall and its variation from the normal in the eleven meteorological provinces :—

Meteorological Provinces.	Average actual rainfall of month.	Average normal rainfall of month.	Variation from normal.
Burma Coast	31·87	27·38	+ 4·49
Burma Inland	9·81	9·333	+ 0·47
Assam	14·26	20·09	— 5·78
Bengal and Orissa	7·71	13·1	— 5·82
Gangetic Plain and Chutia Nagpur	5·27	6·94	— 1·62
Upper Sub-Himalayas	1·83	3·86	— 2·03
Indus Valley and North-West Rajputana	0·11	0·87	— 0·77
Rajputana, Central India and Guzerat	0.81	4·14	— 3·27
Deccan	1·72	7·27	— 5·55
West Coast	20·40	31·54	—10·08
South India	2·19	4·47	— 2·16

The chief features of the air movement over India have been already stated in the preceding paragraphs. The most remarkable features were undoubtedly the abnormally strong and violent westerly winds which prevailed over the whole of Northern and Central India from the 9th or 10th to the 18th, and the continuance of north-westerly winds in the Bombay coast districts until nearly the end of the third week of the month.

In consequence of the protracted delay in the complete establishment of the monsoon currents until nearly the end of the month, hot weather conditions prevailed over the greater part of the interior until nearly the end of the month. Hence temperature was more or less largely in excess. The excess was most marked in the Central Provinces, North Deccan and Berar, where the south-west monsoon is usually established early in June.

The following gives data for the stations at which the increased temperature was most strongly established :—

Station.	Variation of		
	Maximum from normal.	Minimum from normal.	Mean from ormal.
Nagpur	+11·4	+6·5	+9·0
Raipur	+10·2	+5·1	+7·7
Amraoti	+ 9·5	+4·6	+7·1

As is usual during strongly-marked hot weather conditions, both the maximum and minimum temperature was above the normal, the excess being, however, somewhat greater in the day than in the night temperature. The

excess of temperature was almost as strongly shewn at the hill stations as at the neighbouring plain stations.

HILL STATION.	Variation from normal.	PLAIN STATION.	Variation from normal.
Pachmarhi	+6·7	Hoshangabad	+6·1
Mount Abu	+1·6	Deesa	+2·6
Ranikhet	+2·0	Bareilly	+0·8

There was a slight deficiency of temperature in Assam and North Bengal and in the Indus Valley and Beluchistan. The latter was almost certainly a residual effect of the severe winter. The deficiency at Jessore was 5·1°.

The variations of the humidity and amount of cloud were as large and strongly marked as those of the temperature. The air was very much drier over the whole of the interior, and more especially in the Central Provinces, Central India, Rajputana and the North-Western Provinces. The following table gives the mean variation of the aqueous vapour pressure, humidity and amount of cloud from the normal in the large meteorological provinces of India:—

DIVISION.	MEAN VARIATION OF		
	Aqueous vapour pressure from normal.	Humidity from normal.	Cloud amount from normal.
Burma Coast and Bay Islands	−·022	·0	+0·8
Assam	−·004	0	+0·3
Bengal and Orissa	+·024	−4	−0·6
Gangetic Plain and Chutia Nagpur	−·053	−4	−1·2
Upper Sub-Himalayas	−·105	−8	−2·2
Indus Valley and North-West Rajputana	−·109	−7	−0·5
East Rajputana, Central India and Guzerat.	−·090	−10	−2·6
Deccan	−·090	−15	−2·1
West Coast	+·003	−4	−1·2
Southern India	+·012	−2	−1·0

Atmospheric Pressure.

The distribution of mean 8 A.M. pressure for June is shewn by means of two charts. The first chart (Plate I) gives the distribution of the mean pressure of the month reduced to sea level and to constant gravity (that of latitude 45°) by means of isobars drawn for differences of pressure of ·05″ or $\frac{1}{20}$th of an inch. The second chart (Plate II) gives the variations of the actual mean pressure from the normal pressure. These values are obtained from the barometric readings reduced for temperature only. A small chart No. 4 of Plate III gives the distribution of the monthly mean daily pressure and of the mean winds in the same form and manner as in the monthly charts given hitherto in annual reports on the meteorology of India. The data on which this chart is based are given in Table II. The pressure data used in this chart are, it should be noted, reduced to constant gravity (that of 45° Lat.) as well as to sea-level. The more important barometric changes and movements during the month are fully given in the following statement of the barometric depressions of the month.

The data that are chiefly used in this discussion are the 8 A.M. reduced observations and the variations derived from a comparison of these observations and the normal values given in Table I. The means in the third column are not only reduced or corrected to sea level, but also to constant gravity. The normal means are obtained from the observations of the period 1878-88, and in order that the means and variations may be strictly comparable, the means have been calculated for observations of the same period in all cases.

The mean pressure of the whole of India for the month of June 1891 was ·014″ above the normal.

The actual variations of the pressure from the normal are shewn on the chart (Plate II) by means of the lines of equal variations. The variations at the hill stations (*viz.*, stations, the heights of which exceed 3,000 feet) are given in small figures.

The variations at the hill stations were in every case larger and more marked than at the neighbouring plain stations except in the Eastern Himalayas, as represented by Darjeeling, thus indicating that the vertical gradients were smaller than usual. The following gives data:—

HILL STATIONS.	Variation of mean pressure of month from normal.	NEIGHBOURING PLAIN STATIONS.	Variation of mean pressure of month from normal.
Quetta	+·078	Jacobabad	+·035
Murree	+·035	Rawalpindi	+·008
Simla	+·018	Ludhiana	−·011
Pachmarhi	+·053	Hoshangabad	+·037
Wellington	+·038	Coimbatore	+·006
Mount Abu	+·050	Deesa	+·063
Darjeeling	−·011	Dhubri	−·011
Kailang	+·033	Lahore	0
Leh	+·010		

These figures show that this increased pressure in the middle atmospheric strata was most strongly exhibited in Beluchistan, and also that the increase diminished in amount from Murree to Leh, and hence was probably a feature of the atmosphere below the level of 15,000 or 20,000 feet at the utmost. It was in part, at least, due to the diminished temperature at the hill stations as compared with the plain stations.

Allowing for the general variation, the pressure anomalies were positive or pressure was locally in excess

over near the whole of India to the west of the 80th meridian. The anomalies were greatest in the area round the Gulf of Cambay as represented by the stations of Surat (+·065″) and Rajkot (+·060″). They exceeded ·04″ in Lower Sind, the North Punjab, Cutch, Kathiawar and North Bombay.

The pressure anomalies were negative at all stations to the east of the 80th meridian. They exceeded ·02″ in Burma, Central and East Bengal and Assam, and were greatest at the following stations:—

Sibsagar	—·035″	Thayetmyo	—·031″
Patna	—·035	Tounghoo	—·034
Berhampore	—·032	Rangoon	—·041
Moulmein	—·036		

Pressure anomalies were positive over the southern portion of the Bay. Thus the anomaly for Port Blair was +·021″ and for Colombo +·021″.

The normal or average distribution of pressure in the month of June is comparatively simple. Pressure in the Indian area is highest in Ceylon, the south of the Bay and Arabian Sea, where it averages 29·85,″ and is lowest in Upper Sind and the Punjab, where it is slightly below 29·50″. The average range of pressure is hence nearly four-tenths of an inch. The isobars usually run from west-north-west to east-south-east across the Peninsula and from south-west to north-east across the Bay of Bengal. Pressure usually decreases northwards to a belt of country running from Orissa to Upper Sind or the South-West Punjab, and thence increases northwards again to the Himalayas. This long narrow belt, characterized by a lower pressure than in the districts either to the north or south, is a very important feature of the south-west monsoon. This belt, which may be termed the south-west monsoon low pressure trough, is occasionally displaced, sometimes to the north and sometimes to the south; but in each case its displacement accompanies and marks very definite modifications of the strength and extension of the two branches of the monsoon current. This trough is the westward extension of the shallow depression crossing Chutia Nagpur and Bundelkhand, a feature in the pressure distribution which usually originates during the hot weather in March and April. When the south-west monsoon is fully established this trough usually separates an area to the south-west, in which the Bombay current exclusively prevails, from an area to the north-east, in which the Bay of Bengal current is predominant. The eastern extremity of this trough sometimes extends across Orissa into the head of the Bay in the months of July and August; and when this is the case there is a very marked tendency for cyclonic storms to be generated and to march along the trough. The trough itself is, throughout the monsoon, characterized by very variable and unsteady winds. It is for these and other reasons one of the most important features of the pressure distribution during the rains.

A reference to Plate I will show that the mean range of pressure in the Indian area during the month of June 1891 was very nearly ·4,″ and hence almost identical with the normal. The mean range varied considerably during the month, chiefly due to large changes of pressure in North-Western India. The following is a statement of the more important oscillations during the month:—

DATE.	Highest pressure in Indian area.	Where observed.	Lowest pressure in Indian area.	Where observed.	Range of pressure.
	Inches.		Inches.		Inch.
1st	29·88	Colombo	29·54	Punjab	·34
4th	·00	Colombo	·42	Punjab	·48
18th	·81	Colombo	·53	Behar	·28
20th	·85	West Coast	·47	Punjab	·38
24th	·87	Colombo	·47	Punjab	·40
27th	·88	Travancore	·39	Punjab	·49
30th	·87	Colombo	·40	Punjab	·47

The preceding table shows that the range of pressure varied between ·28″ and ·49″ during the month. The great advance of the monsoon currents across the Bombay coast occurred between the 20th and 24th, and across the Bengal coast on the 25th and 26th, and hence prior to the greatest range of pressure, which was shewn on the 27th. It should also be noted that the range of pressure between the 4th and 14th varied within very narrow limits, and exceeded four-tenths of an inch during the whole of that period. Yet during that period and for upwards of a week afterwards there were no indications of the advance of the south-west monsoon current across India. Hence this confirms the statements made in previous annual reports, that low pressure conditions in Northern and Central India and steep pressure gradients in India are not the only conditions or factors essential to the immediate advance of the monsoon currents into India from the Arabian Sea. Certain changes appear to be necessary in that sea area which are probably only in part induced by the conditions prevailing in India. What these changes are can at present, in the absence of systematic knowledge of the current meteorology in the sea area to the south of India, only be conjectured.

A glance at the distribution of pressure as shewn in Plate I or in Plate III, Chart 4, will show that the mean position of the trough of low pressure was further to the north than usual. The following stations define the mean position of the line of lowest pressure running across Northern India—Burdwan, Gya, Allahabad, Delhi, Montgomery and Mooltan. The northward shift of this trough from its normal position in India was a very conspicuous feature of the meteorology of the month, and was when most pronounced associated with the withdrawal of the Bay of Bengal current from the Gangetic Plain.

The following gives a brief statement of the more important changes in the pressure distribution during the month. At the commencement of the month pressure was

above the normal over the whole of India, the excess being greatest in Guzerat, Kathiawar and Sind. Pressure was a third of an inch lower in the Punjab than in the south of the Bay. A low pressure area, the continuation and extension of the hot weather low pressure area of the previous month in Chutia Nagpur, stretched from Orissa to Bundelkhand.

During the next three days pressure diminished in Northern India, the decrease being greatest in Upper India. On the morning of the 4th pressure was nearly half an inch lower in Upper Sind than in the south of the Bay. Winds had increased considerably in force at the head of the Bay, and a humid current was pressing westwards up the Gangetic plain. On the 3rd and 4th the Chutia Nagpur low pressure area had merged into a trough of low pressure running from Orissa to Upper Sind. On the 6th a separate shallow depression again formed in Chutia Nagpur. No change of importance occurred on the 7th, but on the 8th the Chutia Nagpur depression was transferred to North Behar. At the same time the humid easterly current withdrew from the North-Western Provinces, and rain ceased to fall in that area and was almost restricted to Bengal from the 8th to the 11th. This very shallow depression finally disappeared on the 11th, and on the morning of the 12th pressure was lowest along the foot of the hills from Sialkot to Purneah. The distribution of pressure which was initiated by the changes of the previous two days was very abnormal, and continued unchanged during the next two days. Pressure was in defect over the whole of Northern India, the deficiency being greatest in Assam and North Bengal, where it exceeded an eighth of an inch. It was on the other hand in excess in Western India, the excess being greatest in Kathiawar and North Bombay, where it was nearly a tenth of an inch above the normal. This abnormal gradient of more than two-tenths of an inch from west to east caused a large increase in the strength of the westerly winds blowing across Northern and Central India at this time. In the North Deccan, Central Provinces, Central India and Rajputana, the westerly winds approached in force to a gale. On the 14th, pressure increased rapidly in Upper India and oscillated rapidly during the next three days, when a further large increase of pressure occurred in Upper India. On the morning of the 18th pressure was nearly three-tenths of an inch above the normal in the North-West Punjab. The excess decreased in amount southwards and eastwards. There was a slight deficiency in Lower Burma and Southern India. Pressure was as hitherto lowest along the foot of the hills from Sialkot to Patna and Purneah. Pressure decreased on the 19th and 20th, but this produced no important change in the distribution of pressure, and abnormally strong westerly winds continued to blow across Central India and the North Deccan during the whole of this period. On the 22nd a shallow depression began to form again in Chutia Nagpur and at the same time rain commenced to advance along the Bombay coast. On the 23rd pressure was in excess over the whole of North-Western India, the excess being more than a seventh of an inch in the Indus valley; on the other hand pressure was below the normal in North-Eastern India and the eastern half of the peninsula. The deficiency was greatest in Burma, where it slightly exceeded ·05″. The Chutia Nagpur depression continued unchanged in position and character on the 24th, 25th and 26th. During this period pressure gave way rapidly in Upper India and a separate depression appeared in the West Punjab on the 26th. This intensified on the 27th, whilst the Chutia Nagpur depression was absorbed in the trough of low pressure, which now formed and ran from Orissa through Agra and Delhi to Mooltan. The pressure condition now differed less from the normal than at any period since the commencement of the month. There was a moderate excess of pressure in Western India and a slight deficiency in Eastern India. Pressure continued to fall in the Punjab until the 28th and 29th, when the lowest readings of the month were observed at Dera Ismail Khan and Rawalpindi. During this period, from the 26th to the 29th, the monsoon current from the Arabian Sea had advanced into the Central Provinces and Central India and the Bay current into Behar and the North-Western Provinces. On that day pressure was below the normal over the whole of India, the deficiency varying from ·01″ in Ceylon and Burma to over ·12″ in the greater part of the Punjab. The advance of the monsoon currents had hence temporarily reversed the pressure conditions and anomalies subsisting at the time of their setting in over nearly the whole of Northern and Central India. The following table gives the mean anomalies of the 23rd and 29th by way of comparison :—

	23rd.	29th.	Change.
Burma	−·061	−·010	+·05
Bengal and Assam	−·036	−·050	−·01
N.-W. Provinces	−·008	−·058	−·05
Punjab	+·062	−·117	−·17
Sind	+·134	−·105	−·23
Rajputana	+·062	−·080	−·14
Central India	+·051	−·063	−·11
Central Provinces	+·028	−·034	−·06
Bombay	+·027	−·049	−·07
Madras	−·023	−·042	−·01

This large decrease of pressure in Upper India accompanied the advance of the monsoon currents into the interior of India. Comparison with previous years shows that it is almost certainly an invariable meteorological feature of that advance. It is sufficient at present to point out the fact without giving any explanation, noting that it is one of the many phenomena of the advance of the south-west monsoon current which are utterly unintelligible on the furnace theory or hypothesis that it is due to indraught to a hot area.

Summary of Special Storm Reports.

The preceding discussion of the pressure data of the month has shewn that it was singularly free from large atmospheric disturbances such as are usually indicated by the formation of large barometric depressions and cyclonic storms. Hot weather conditions of unusual intensity, however, prevailed during the greater part of the month. Hence the classes of storms which are due to local thermal disturbance, *e.g.*, duststorms, hailstorms and thunderstorms, were of unusual frequency during the month, and were in one of two cases at least of abnormal violence. The following gives a list of the storms specially reported by the meteorological observers with, in a few cases, brief extracts from the observations :—

1st.—Duststorms at Hoshangabad (4 P.M.), Khandwa (7-30 P.M.) and Neemuch.

3rd.—Duststorms at Nagpur (3 P.M.) and at Sutna (4-35 P.M.)

4th.—Severe thunderstorms at Allahabad at (4 A.M.). The barometric movements during the storm were very irregular. The following readings give the more noteworthy:—

Hour.	Actual reading of barometer.	Attached thermometer.	Barometer corrected and reduced to 32°.	Wind direction.
3 A. M. . .	29·432	92·5	29·263	E. N. E.
4 A. M. . .	·502	88·3	·343	N. N. E.
4-15 A. M. . .	·382	87·5	·227	E. S. E.
4-30 A. M. . .	·364	86·0	·213	E. S. E.

Severe thunderstorm at Hazaribagh (7 P.M.) and duststorm at Hyderabad (Sind).

5th.—Hailstorm at Saugor (1-50 P.M.) and duststorm at Bhuj. Violent duststorm at Jubbulpore (3-30 P.M.). Severe hailstorms in the Itarsi District. Many huts and trees were blown down during the storms at Saugor and Jubbulpore.

6th.—Duststorms at Saugor (3 P.M.), Ajmere (3-30 P.M.), Hoshangabad (6-10 P.M.), and Bhuj. Thunderstorm at Dhubri.

7th.—Very violent duststorm at Raipur (from 5-25 P.M. to 6 P.M.). The amount of wind registered by the anemometer during this interval is stated by the observer to have been 81 miles. Many trees and huts were blown down. Duststorm at Lahore at 7 P.M.

9th.—Duststorms at Allahabad (4-20 P.M.), Bhuj (5 P.M.), Peshawar (7-35 A.M.), Ghaziabad (3 P.M.), Lahore (6 P.M.), and Mooltan (7-5 P.M.). Thunderstorm with severe gale of wind at Vizagapatam.

10th.—Duststorms at Allahabad (5 P.M.), Lahore (5 P.M.), and Sirsa (6-20 P.M.). The Chief Observer, Lahore, states he ascertained by enquiry that a duststorm passed over Montgomery at 0-30 P.M., another over Ferozepur at 5 P.M., and others over Jhelum and Ludhiana at 10 P.M. He thence infers that a disturbance or storm advanced from the west and was probably continuous from mid-day to mid-night. This, however, appears to be very improbable, as there has been as yet no positive proof of the continuous existence of any of the class of hot-weather storms for more than two or three hours.

11th.—Duststorm at Allahabad (5 A.M.) and Sirsa (4-30 P.M.

13th.—Duststorms at Peshawar (3-20 P.M.), Jacobabad (6-30 P.M.), and Lahore.

14th.—Severe thunderstorm and rain squall at Diamond Island. This was an example of a class of squalls which are of frequent occasional occurrence during the south-west monsoon period, and which are usually most frequent and severe during the great advance of this current up the Bay in June. There was nothing special on the meteorology of the Bay so far as is indicated by the few observations received from ships to explain its origin. Moderate south-west monsoon winds, ranging in force from 3 to 7, prevailed at this time over the Bay. They were undoubtedly weakest off the Arakan and Burma Coasts or in the area in which the squall was formed :—

Hour.	Barometer corrected and reduced to 32°.	Wind.	Remarks.
1 P.M. . .	...	N. E.	Clouds gathering in north-east. Sea slight.
2 P.M. . .	...	N. E.	Heavy rain. Distant lightning.
4 P.M. . .	29·728	N. E.	Sea very rough. Terrific thunder and lightning.
5 P.M. . .	·752	E.	Heavy rain.
6 P.M. . .	·740	E. N. E.	
6-30 P.M. .	...	W.	Rain ceased.
7 P.M. . .	...	S. S. E.	

Total rainfall during the storm was 3·66 inches.

15th.—Violent rain squall at Port Blair. This was similar in character to the severe squall experienced at Diamond Island on the 14th.

The logs of ships in the neighbourhood of the Andamans show that winds were very unsteady on the 14th, 15th and 16th over the adjacent part of the Bay of Bengal. The following

give a brief summary of observations taken at Port Blair during the squall :—

Hour.	Barometer corrected and reduced to 32°.	Wind direction.	Average wind velocity since preceding observation.	Rainfall since last measurement.
1-50 P.M.	...	W.S.W.	.....	...
2 P.M.	29·811	Variable between N.N.W. and N.N.E.	.....	...
2-15 P.M.	·781	Variable between W.N.W. and E.N.E.	51 miles per hour (since 2 P.M.)	0·25 (since 2 P.M.)
2-30 P.M.	·781	Variable between N.N E. and E.S.E.	4 miles per hour	0·40
2-45 P.M.	·788	Variable between E.N.E. and N.N.W.	35 miles per hour	0·70
3-15 P.M.	·781	Variable between E.N.E. and W.N.W.	12 miles per hour	1·05
4 P.M.	·780	W.N.W.	15 miles per hour	1·44

The lower clouds moved from east-north-east until the end of the squall when they came from west-north-west. The total rainfall of the 24 hours ending 8 A.M. of the 16th was 7·92 inches, of which 3 85 inches fell during the squall between 2 and 4 P.M. of the 15th.

16th.—Thunderstorm at Berhampore (4-30 P.M.). Duststorm at Ludhiana (5 P.M.).

17th.—Duststorms at Lahore (3-40 P.M.) and Ludhiana (4-15 P.M.).

18th.—Duststorm at Sirsa (6·25 P.M.).

19th.—Severe thunderstorm at Bellary (3-15 P.M.) from south-west. The information collected by the observer shows that this thunderstorm was very local, extending over an area of less than twenty miles in diameter.

20th.—Thunderstorm at Nagpur at 3 P.M. The barometer at 2-50 P.M. read 28·654, and at 3·10 P.M., 28·700. It was steady during the remainder of the storm. Duststorm at Aden (from 9-15 A.M. to 9-40 A.M.). It crossed from north to south-west.

24th.—Duststorm at Khandwa at 5·20 P.M.

25th.—Severe duststorm followed by thunder and hail at Khandwa. The barometric observations which appear to have been carefully taken indicate very large and rapid changes during this storm. The following are the most remarkable :—

Hour.	Barometer.			Average wind velocity during interval since preceding observation.
	Actual reading.	Attached thermometer.	Corrected and reduced to 32°.	
5-15 P.M.	29·684	98·0	29·500	
5-30 P.M.	29·806	89·0	·645	64 miles per hour.
5-45 P.M.	29·704	86·0	·552	20 miles per hour.

26th.—Duststorms at Nagpur (3 P.M.) and Hoshangabad (5-50 P.M.).

28th.—Duststorm at Patna (3-30 P.M.).

29th.—Duststorms at Sirsa (4 P.M.) and Lahore (7 P.M.).

30th.—Duststorm at Sirsa (3 P.M.).

Weather in the Bay of Bengal and Arabian Sea.

Arabian Sea.—At the commencement of the month strong monsoon winds with squally weather, thunder and heavy rain prevailed over the western and central portions of the Arabian Sea between Socotra and the meridian of 62° E. Winds in this part of the Arabian Sea varied in strength from 3 to 7, and were unsteady. Between the meridian of 62° E. and the Bombay Coast, winds decreased in force, and light north-west winds with a moderate sea obtained near the coast.

The weather moderated to some extent in the western half of the Arabian Sea during the second week. The mail steamer *Kaiser-i-Hind* had moderate to fresh monsoon winds from Long 57°9′ to Long. 65°14′ E., and light variable winds force 1 during the remainder of her passage to Bombay. Weather was squally with light variable winds off the Malabar Coast. Fine clear weather prevailed over the north and north-east of the Arabian Sea. No change occurred until nearly the end of the third week of the month when winds began to increase in force in the south-west of the Arabian Sea, and weather became more and more squally. The *Canton*, in Lat. 15°48′ N. and Long. 59°58′ E. at noon of the 21st, had very heavy rain squalls, and the *Karoon* in Lat. 13°50′ N. and Long. 53°42′ E., a fresh SSW gale. The S. S. *Crathorn*, in Lat. 15° 32′ N. and Long. 61°22′ E. on the 22nd, had squalls with torrents of rain, and south-west winds, force 6. Winds also began to strengthen near the Bombay Coast and to shift to west. On the 25th the S. S. *Aberdeen*, in Lat. 16° 13′ N. and Long. 70° 54′ E. at noon, had heavy rain squalls during the day. Winds strengthened steadily during the remaining days of the month, and moderate to fresh monsoon winds (ranging in force from 4 to 7) obtained over the south and centre of the Arabian Sea at the end of the month.

Bay of Bengal.—At the commencement of the month weather was fine with strongish winds in the south and west of the Bay. The average force of the winds in the Bay was 4, except off the Burma Coast, where they ranged from 2 to 4 and averaged 2·5. Weather was somewhat squally off the South Ceylon Coast and the Coast of the Circars in about Lat. 16° N. and Long. 82° to 86° E. Winds were

lighter and more variable in the Andaman Sea (more especially near the Burma Coast) on the 3rd and 4th, and squally weather set in on the 5th. Fine weather with moderate to strong south-west winds (force 3 to 6) prevailed in the Bay. The squally weather in the Andaman Sea continued until the 10th, and was most severe on the 8th. The S. S. *Palancotta*, in Lat. 10° N. and Long. 97° 24′ E. at noon, had heavy south-west winds and rain squalls. The *Shahjehan*, in Lat. 15° 41′ N. and Long. 94° 9′ E., had strong south-west winds and squalls with heavy rain, and the *Goa*, in Lat. 16° 48′ N. and Long. 92° 51′ E., had frequent squalls with a heavy to a mountainous sea during the day. The weather improved on the 11th, and from that date to the 16th or 17th steady moderate winds and fine weather prevailed in the Bay and Andaman Sea. Winds decreased somewhat in force during the next two or three days and light to moderate winds (force 2 to 5) obtained in the Bay; occasional showers occurred near the Burma Coast, and weather was fine and clear over the greater part of the Bay. During the whole of this period weather was squally with strong winds and much rain in the equatorial belt from Lat. 6° S. to Lat. 6° to 8° N. No change occurred in the Bay until the 26th or 27th, when weather began to be squally in about Lat. 19° N. and winds to strengthen in the centre and south of the Bay. The *Patna*, in Lat. 17° 40′ N. and Long. 92° 26′ E. at noon of the 28th and proceeding to Calcutta, had squalls with moderate to fresh winds in the evening. The *Kasara*, in Lat. 14° 54′ N. and Long. 92° 25′ E., had hard, continuous squalls with blinding rain in the evening. A large number of vessels in the north and north-east of the Bay reported similar squally weather with increasing winds The S. S. *Kasara*, in Lat. 14° 12′ N. and Long. 88° 29′ E. at noon of the 29th, had a fresh to strong south-west monsoon with frequent heavy squalls. On the 30th fresh to strong south-west monsoon winds with squalls and heavy rain were reported by many vessels in the centre and north of the Bay. Hence the last week of the month witnessed a considerable increase in the strength of the south-west winds prevailing in the Bay and the setting in of squally weather. These squalls occurred in every part of the Bay, but were apparently most frequent and severe in the south of the Bay and off the Arakan Coast.

Temperature of the Air.

The distribution of temperature in India for June 1891 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. The continuous lines indicate that the temperature was in excess by the amount indicated by the number given near the line, and the broken lines 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 data by means of which these charts have been prepared are given in Table I. The mean maximum and minimum temperatures have been obtained for each station from the observations of the same number of years, *viz.*, 1878 to 1888. 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 amounts, which vary from month to month. But the variation of the mean daily temperature from the normal, as determined by the use of this definition, agrees in almost all cases very closely with the variation as determined by the use of true daily means based on readings of the dry bulb thermometer 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.

The mean maximum or day temperature of the month was above the normal over the whole of India with a few local exceptions, the chief of which were Gorakhpur (−4·4°), Quetta (−4·3°), Sibsagar (−2·3°), Kurrachee (−1·4°), Madura (−1·2°), and Peshawar (−1·0°). The deficiency at Gorakhpur and Sibsagar was due to heavy local rainfall, and at Quetta, Kurrachee and Peshawar it was undoubtedly a residual effect of the previous winter's heavy snowfall. Over by far the greater part of the country, including the South-West Punjab, Rajputana, Central India, Berar, the Central Provinces and the Deccan, the mean maximum temperature was more than 4° above the normal. The excess was absolutely greatest in the Central Provinces, at Nagpur (+11·4°), and Raipur (+10·2°), and averaged 8° for the whole of that province.

The mean minimum or night temperature was also above the normal over the greater part of the country. The increased night temperature was due to the same cause as the increased day temperature, *viz.*, the prolonged continuance of hot-weather conditions over the interior of India. The excess ranged from 2° to 6½° in Rajputana, Central India, the Central Provinces, Berar, the North Deccan, and the Konkan. It was most marked in the area of most excessive day temperature. Thus at Nagpur the excess was 6·5°, and at Raipur (5·1°). It averaged 4° for that province and

Berar. The mean minimum temperature was in moderate defect in the Indus valley districts, the Indo-Gangetic Plain (except South Bengal), Assam and Lower Burma. The deficiency was less than 2° at all the meteorological stations in those districts except the following :—

Station.	Deficiency.
Diamond Island	−3·2°
Roorkee	−2·1°
Meerut	−2·4°
Lahore	−2·9°
Jacobabad	−2·6°

It is noteworthy that the mean night temperature of the month was above the normal at all the Himalayan hill stations. As already stated it was very considerably below it at Quetta (*viz.*, 5·9°).

The mean daily temperature of the month was hence above the normal over the whole of India except the North Punjab, North Behar, North Bengal, Assam, and the south-west districts of Lower Burma, and locally at Quetta, Kurrachee, Coimbatore and Madura. The deficiency in these districts was less than 2° in amount except at Quetta (−5·1°) and Gorakhpur (−2·9°). The excessive temperature was most strongly shewn in the Central Provinces, Berar, and Rajputana, over the greater part of which the mean temperature of the month was more than 6° above the normal. The excess was absolutely greatest at Nagpur (9·0°), Raipur (7·7°) and Amraoti (7·1°). It was nearly as large in amount at the hill station of Pachmarhi (6·7°), and was as large at each of the Himalayan hill stations as at the nearest plain stations. There was a very slight deficiency at Kailang (−0·7°), and Leh (−0·1°). There was a considerable deficiency at Quetta (−5·1°), and Kurrachee (−1·4°), which indicated that the temperature of Beluchistan and Afghanistan was considerably below the average, and that the excessive snowfall in the Afghan mountains during the winter continued to influence the temperature and other meteorological conditions in North-West India and the adjacent countries.

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

Province.	Variation of		
	Mean maximum temperature from normal.	Mean minimum temperature from normal.	Mean temperature from normal.
Burma Coast and Bay Islands	+0·6	−0·3	+0·2
Assam	−0·7	−0·6	−0·7
Bengal and Orissa	+1·4	+0·9	+1·2
Gangetic Plain and Chutia Nagpur	+0·3	−0·2	0
Upper Sub-Himalayas	+1·5	−1·4	0
Indus Valley and North-West Rajputana	+2·6	−6.0	+0·9
Eastern Rajputana, Central India, and Guzerat	+4·2	+1·8	+3·0
Deccan	+7·8	+3·3	+5·6
West Coast	+2·2	+1·4	+1·8
Southern India	+2·3	+1·1	+1·7

At the commencement of the month temperature was above the normal over the whole of India. The excess on the 1st was greatest at Masulipatam (8·2°), Secunderabad (8·4°), and Jubbulpore (8·3°). The following gives the temperature variation data of that day :—

Province.	Average variation of maximum temperature from normal.	Average variation of minimum temperature from normal.	Average variation of mean temperature from normal.
Burma	+1·2°	−0·6°	+0·3°
Bengal	−0·9°	+0·7°	−0·1°
North-Western Provinces	+3·1°	+2·5°	+2·8°
Punjab	+5·1°	−3·0°	+1·1°
Sind and Rajputana	+3·8°	+3·5°	+3·7°
Central India and Guzerat	+2·3°	+2·9°	+2·6°
Central Provinces	+5·1°	+4·2°	+4·7°
Bombay	+3·2°	+0·7°	+2·0°
Madras	+4·2°	+1·9°	+3·1°

Temperature increased rapidly in Northern India during the next 48 hours, and the highest maximum temperatures of the year were recorded on the 3rd and 4th in Upper India. The following table gives the highest recorded on the 4th, the hottest day of the year :—

Date.	Station.	Maximum temperature.	Variation from normal of day.	Highest previously recorded maximum temperature
4th June	Jacobabad	122·0°	+ 9·9°	123·0°
"	Dera Ismail Khan	119·5°	+12·8°	121·5°
"	Mooltan	119·3°	+12·6°	119·0°

The following table gives temperature variation data of the 3rd :—

Province.	Average variation of maximum temperature from normal.	Average variation of minimum temperature from normal.	Average variation of mean temperature from normal.
Burma	+4·9°	+1·3°	+3·1°
Bengal	−2·9°	+0·5°	−1·2°
North-Western Provinces	−0·7°	+1·0°	+0·2°
Punjab	+7·8°	+2·2°	+5·0°
Sind and Rajputana	+6·7°	+4·8°	+5·8°
Central India and Guzerat	+6·0°	+2·4°	+4·2°
Central Provinces	+6·2°	+2·9°	+4·6°
Bombay	+3·2°	+1·6°	+2·4°
Madras	0	+0·9°	+0·5°

A rapid reduction of temperature commenced on the 4th which accompanied slight disturbance, dust and thunderstorms, and general rainfall over nearly the whole of Northern India. The rainfall was exceptionally heavy at Gorakhpur and in some parts of Oudh, and hence the fall of temperature was greatest in Oudh and the eastern districts of the North-Western Provinces. The maximum or day temperature of the 5th was 23·8° below the normal at Gorakhpur and 22·3° at Lucknow, and on the 6th was 26·1°

below the normal of the day at Gorakhpur. The following table gives temperature variation data of the 6th :—

PROVINCE.	Average variation of maximum temperature from normal.	Average variation of minimum temperature from normal.	Average variation of mean temperature from normal.
Burma	+ 1·9°	—0·4°	+0·8°
Bengal	— 4·8°	—1·2°	—3·0°
North-Western Provinces	—12·7°	—4·1°	—8·4°
Punjab	— 0·4°	+5·1°	+2·4°
Sind and Rajputana	+ 1·9°	+2·9°	+2·4°
Central India and Guzerat	— 2·4°	—2·0°	—2·2°
Central Provinces	+ 2·2°	—1·7°	+0·3°
Bombay	+ 2·5°	+2·1°	+2·3°
Madras	— 1·3°	+0·4°	—0·5°

As light to moderate rain, chiefly as thunder showers, fell almost daily from the 4th to the 11th in Bengal and the Gangetic Plain, and the south-west monsoon current failed to advance along the west coast, no large change occurred during this period in the temperature conditions. Temperature was more or less above the normal in the Peninsula and North-Western India, and below it in Bengal and the North-Western Provinces.

A period of very dry hot weather over the whole of the interior of India followed and lasted until nearly the end of the month. Burma, Assam, Bengal, and Malabar received daily rain during this period, but the amounts were small, more especially in Bengal and Malabar. Hence temperature increased rather rapidly in Northern and Central India from the 11th to the 19th or 20th, and was excessive from that date to the 26th.

The following table gives the variation of the mean temperature of the day from the normal during the abnormally hot period :—

PROVINCE.	VARIATION OF THE MEAN TEMPERATURE OF THE DAY FROM THE NORMAL ON THE					
	21st.	22nd.	23rd.	24th.	25th.	26th.
Burma	+ 0·9°	+ 0·7°	+ 0·9°	+ 1·2°	+ 2·3°	+ 0·7°
Bengal	+ 5·3°	+ 4·5°	+ 4·0°	+ 4·1°	+ 4·2°	+ 3·9°
North-Western Provinces	+ 4·4°	+ 4·1°	+ 3·6°	+ 4·1°	+ 5·7°	+ 7·0°
Punjab	— 0·9°	— 0·1°	— 0·8°	+ 0·3°	+ 1·7°	+ 3·7°
Sind and Rajputana	+ 0·5°	+ 1·3°	+ 1·6°	+ 3·3°	+ 4·7°	+ 5·6°
Central India and Guzerat	+ 5·5°	+ 5·0°	+ 5·3°	+ 7·0°	+ 7·3°	+ 8·2°
Central Provinces	+ 11·3°	+ 11·0°	+ 10·5°	+ 11·6°	+ 12·2°	+ 11·9°
Bombay	+ 3·2°	+ 2·5°	+ 1·2°	+ 2·3°	+ 1·5°	+ 1·8°
Madras	+ 2·6°	+ 2·8°	+ 2·3°	+ 3·2°	+ 3·0°	+ 2·9°

During this period the mean daily temperature ranged between 95° and 105° in Sind, the Central Provinces, Rajputana, the greater part of the Punjab, the North-Western Provinces and Central India. The maximum day temperature ranged between 110° and 120° over the area. The highest mean temperatures of 24 hours were recorded at Jhansi on the 26th (105·2°), and Agra on the 27th (105·5°). The following table gives some of the more noteworthy maximum temperatures registered during the period of excessive temperature :—

DATE.	STATION.	Recorded maximum temperature.	Variation from normal of day.
20th	Pachmarhi	99·7°	+16·0°
"	Amraoti	111·8°	+16·2°
21st	Nagpur	113·9°	+18·2°
"	Raipur	111·7°	+17·7°
22nd	Raipur	112·7°	+19·2°
"	Allahabad	112·9°	+11·9°
23rd	Raipur	111·7°	+18·7°
24th	Nagpur	112·8°	+18·7°
"	Raipur	112·2°	+19·4°
"	Agra	113·5°	+11·4°
"	Jacobabad	114·2°	+ 4·2°
25th	Nagpur	113·9°	+20·3°
"	Raipur	113·7°	+21·6°
"	Jhansi	114·5°	+14·8°
"	Dera Ismail Khan	115·5°	+ 8·4°
"	Jacobabad	116·1°	+ 5·7°
26th	Raipur	112·7°	+21·6°
"	Seoni	108·2°	+20·4°
"	Jhansi	114·5°	+15·5°
"	Dera Ismail Khan	117·5°	+10·3°
"	Jacobabad	117·1°	+ 6·7°

As already pointed out the 25th and 26th were the days of the greatest excess temperature in the Central Provinces, Central India, Rajputana, and the North-Western Provinces, the day temperature ranging from 10° to 22° above its normal value for the period.

On the 26th the monsoon currents from the Arabian Sea and Bay of Bengal began to advance into the interior. Rain commenced to fall generally in the Central Provinces and Bengal on the 27th. It extended to Behar on the 29th, and to the North-Western Provinces on the 30th. Hence a rapid reduction of temperature occurred during this period. The following give variations of the mean temperature of the day from the normal from the 27th to the 30th :—

PROVINCE.	VARIATION OF THE MEAN TEMPERATURE OF THE DAY FROM THE NORMAL ON THE			
	27th.	28th.	29th.	30th.
Burma	+0·1°	+0·6°	—0·1°	—0·8°
Bengal	+3·3°	+2·0°	—0·7°	—1·8°
North-Western Provinces	+8·0°	+7·3°	+2·4°	—0·2°
Punjab	+4·6°	+5·3°	+5·5°	+5·1°
Sind and Rajputana	+4·4°	+4·5°	+3·4°	+1·8°
Central India and Guzerat	+7·0°	+5·9°	+2·6°	+2·8°
Central Provinces	+8·3°	+5·4°	+0·8°	+3·9°
Bombay	+1·8°	+1·9°	+0·3°	+0·5°
Madras	+3·4°	+3·4°	+1·1°	+1·2°

Winds.

The mean wind direction at 8 A.M. during the month is shewn in Plate I by arrows flying with the wind. It is obtained by the use of Lambert's formula, in which equal value is given to every wind. The data are given in Table I. The mean wind directions derived from the wind observations at 10 A.M. and 4 P.M. are given in the small chart, No. 4 of Plate III, by means of arrows flying with the wind. The data for these will be found in Table II, together with the normal direction as obtained from the observations of the past 10 to 20 years.

The chief features of the air motion over India during the month have been stated in the Pressure section.

Monsoon winds from the Bay of Bengal extended westwards over the Gangetic Plain in the first week of the month. These easterly winds became feebler in Bengal and Behar, and the humid current gradually retreated from the Gangetic Plain. Westerly winds set in and prevailed over the whole of Northern India, from Punjab to Central Bengal, from the 12th or 13th to the 22nd or 23rd. The monsoon current in the north of the Bay then began to increase in strength and advanced westwards up the Gangetic Plain, and at the end of the month extended westwards to the eastern districts of the North-Western Provinces.

The establishment of the Arabian Sea monsoon current on the Bombay Coast was much delayed. Monsoon winds prevailed in Malabar during the whole of the month. In the Konkan and Kathiawar light north-westerly to westerly winds obtained until the end of the third week of the month. Monsoon winds set in on the 20th or 21st in the Konkan and slowly extended to the North Deccan, Berar, Central Provinces, and Central India, in which they generally prevailed at the end of the month.

The abnormal features in the air motion were hence very prominent. The following gives the more important.

Winds in the south-east and east of the Bay had a much stronger westerly component than usual, thus indicating a greater deflection of the monsoon current to Tenasserim and Lower Burma than usual:—

Station.	Direction.		Velocity.	
	Average direction, June 1891.	Normal direction, June.	Average daily air movement, June 1891.	Normal daily air movement, June.
Port Blair	S 36° W	S 38° W	339	230
Diamond Island	S 57° W	S 32° W	171	210
Rangoon	S 36° W	S 16° W	108	130

Winds were lighter (except at Port Blair) and were less steady.

Winds were, on the whole, stronger in Bengal, more especially at the coast stations. Westerly winds were unusually prevalent in the third week of the month, and the mean wind directions show this very strongly. As frequently happens in the hot weather, increased westing of the winds in the interior was accompanied by less westing at Saugor Island and False Point:—

Station.	Direction.		Velocity.	
	Average direction, June 1891.	Normal direction, June.	Average daily air movement, June 1891.	Normal daily air movement, June.
Calcutta	S 12° W	S 4° E	135	147
Dacca	S 14° E	S 16° E	198	171
Saugor Island	S 3° W	S 15° W	410	350
False Point	S 12° W	S 45° W	343	285

In the Gangetic Plain westerly winds of unusual strength prevailed during the greater part of the month, as easterly monsoon winds usually set in during the month; and this change was deferred until the month of July; winds were abnormally strong and steady in that area. The following gives examples:—

Station.	Direction.		Steadiness.		Velocity.	
	Average direction, June 1891.	Normal direction, June.	Average, June 1891.	Normal, June	Average daily air movement, June 1891.	Normal daily air movement, June.
Hazaribagh	N 73° W	S 36° W	32	19	242	213
Allahabad	N 34° W	N 2° E	58	12	175	98
Lucknow	N 32° W	N 51° E	23	17	70	102

Winds were light and unsteady in the Punjab. They were remarkably steady in Lower Sind. The wind data at Jacobabad show very clearly that the low pressure area in Upper India was further north than usual on the average of the month. The mean wind direction of the month at that station was S 10° W, the normal being S 31° E, and the steadiness percentage 8, the normal being 46.

The protracted delay in the advance of the monsoon current across the Bombay Coast influenced winds in the west of the Peninsula in two ways. Winds were on the average of the month much more directly from the west

than usual, and were much below their normal strength. The following gives examples:—

STATION.	DIRECTION.		VELOCITY.	
	Average direction, June 1891.	Normal direction, June.	Average daily air movement, June 1891.	Normal daily air movement, June.
Bombay	S 77° W	S 63° W	298	287
Karwar	N 82° W	S 78° W	80	?

The mean wind direction at Deesa was N 27° W, the normal being S 36 W. Winds were much stronger than usual in Rajputana, Berar and the Central Provinces. This was mainly due to the unusual strength of the dry westerly land winds which prevailed during the third week of the month, *e.g.*,—

DISTRICT.	DIRECTION.		VELOCITY.	
	Average direction, June 1891.	Normal direction, June.	Average daily air movement, June 1891.	Normal daily air movement, June.
Akola	N 44° W	N 71° W	375	214
Nagpur	N 73° W	N 76° W	308	183
Khandwa . . .	N 66° W	N 77° W	335	228

Winds during the month were approximately normal in character in Southern India.

Humidity and Cloud.

The hygrometric data for 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 the minimum of the 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 *Vade-Mecum*, which are 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 5 to 20 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 computed, are the means for periods varying from 5 to 25 years of the available cloud data for the same hours.

The humidity conditions of the month were very abnormal in nearly every part of India. This was of course due to the protracted delay in the establishment of the monsoon currents over Northern and Central India. As stated in last month's report, south-west monsoon winds advanced from the equatorial belt to Burma, Travancore, Malabar, and Southern India generally during the fourth week of that month, and they blew with moderate force and even more steadily than usual throughout the whole of June. The northward extension of these winds into the Bombay Coast districts and Central India was delayed upwards of a fortnight beyond the normal period. Heavy general rain commenced on the Bombay Coast districts on the 23rd and 24th. During the first three weeks of the month the air was hence remarkably dry over the Central Provinces and Central India, to which the monsoon humid current from the Arabian Sea usually extends in the second week of the month. The humidity increased rapidly from the 23rd in the Deccan, Central Provinces, and Central India, and the normal conditions of great humidity and dense cloud were established before the end of the month.

The conditions were somewhat different over the greater part of Northern India. An early advance of monsoon winds from the Bay into Bengal occurred in the last week of the preceding month. These humid winds extended westwards in the first week of June as far as the south-eastern districts of the Punjab. Hence during this period the normal monsoon conditions of humidity and cloud obtained over the Gangetic Plain. On the 7th, these humid winds began to fall off in strength and gradually withdrew during the next three days, so that on the morning of the 11th dry land westerly winds obtained over the whole of Northern and Central India, with the exception of East and South Bengal. No change of importance occurred until the 24th, when the southerly winds at the head of the Bay began to increase in force and extend their influence slowly westwards up the Gangetic Plain. Hence this period from the 11th to the 24th or 25th was one of excessive dryness over the whole of Northern and Central India. Humidity increased largely during the last week of the month, the 25th or 29th being the days on which the increase was largest and most general. The following table gives data for five representative stations in Northern India, showing the variations in the humidity at 8 A.M. during the period, 25th to the 30th of the month:—

STATION.	CHANGE SINCE 8 A.M. PREVIOUS DAY.					
	25th.	26th.	27th.	28th.	29th.	30th.
Hazaribagh .	+40	+16	—22	+20	+15	—5
Allahabad . .	+45	0	0	—18	+25	+3
Lucknow . .	+ 6	+20	+ 4	—20	+25	—3
Roorkee . .	+29	— 5	+ 3	— 1	+19	—1
Lahore . .	0	0	+11	— 1	+ 1	+8

The following table giving the mean humidity of the various provinces at 8 A.M. of the 22nd and of the 30th, shows even more clearly the change effected in the humidity conditions by the advance of the monsoon currents over the Northern and Central India :—

Province.	Average humidity.		Change from 22nd to 30th.
	22nd.	30th.	
Bengal	86	90	+ 4
Behar and Chutia Nagpur	68	87	+19
North-Western Provinces	36	80	+44
Central Provinces and Berar	41	78	+37
Central India	44	76	+32
Rajputana	33	62	+29
Punjab	31	49	+18

The average humidity of the air for the month was very considerably in defect in the Punjab, Sind, Rajputana, and the western and central districts of the North-Western Provinces. This was due as much to deficiency of aqueous vapour as to excessive temperature. The following give data for representative stations in each—

District.	Representative Station.	Variation of	
		Vapour pressure from normal.	Humidity from normal.
Punjab	Lahore	—·178	— 8
	Peshawar	—·131	— 8
	Mooltan	—·184	—13
Sind	Jacobabad	—·174	—10
Rajputana	Jeypore	—·151	—15
N.-W. Provinces	Roorkee	—·070	— 7
	Lucknow	—·150	—11
	Agra	—·127	—10

In Bengal, Behar, and Assam the average humidity of the month varied little from the normal, but was generally in slight defect in Behar and West Bengal. The air was on the other hand more humid than usual in Burma, but the variations, as usual in the rains, in Lower Burma were small.

The mean humidity of the month was even more largely below the normal in the North Deccan, Central Provinces, Berar, and Central India than in North-Western India. The following data for representative station show that the decreased humidity was due as much to a deficiency in the amount of vapour in the air as to the increased temperature. The latter fact, it may be noted, was most strongly developed in the Central Provinces, Berar, and North Deccan. The following gives data for representative stations in each of these areas :—

District.	Station.	Variation from normal of		
		Mean vapour pressure of month.	Mean humidity of month.	Mean temperature.
North Deccan	Belgaum	—·025	—10	+3·7
	Poona	—·064	—13	+3·9
Berar	Akola	—·104	—15	+6·2
	Buldana	—·131	—19	+4·7
Central Provinces.	Raipur	—·224	—28	+7·5
	Nagpur	—·130	—24	+8·9
	Sironcha	—·144	—24	+8·5
Central India	Sutna	—·150	—15	+3·0
	Saugor	—·088	—14	+6·4

The following give the lowest humidity recorded at the driest stations in India during the month and the dates :—

Station.	Date.	Actual humidity at 4 P.M.
Sutna	23rd and 25th, 4 P.M.	4
Lahore	24th and 25th	4
Roorkee	21st	5
Raipur	21st	6
Quetta	28th	6
Jacobabad	24th	7

This statement shows that the lowest humidities were observed immediately before or during the great advance of the monsoon current across the Bombay and Bengal coasts. The following table gives average humidity and aqueous vapour data for the meteorological provinces into which India is divided :—

Division.	Variation of	
	Aqueous vapour pressure from normal.	Humidity from normal.
Burma Coasts and Bay Islands	—·022	0
Assam	—·004	0
Bengal aad Orissa	+·024	— 4
Gangetic Plain and Chutia Nagpur	—·053	— 4
Upper Sub-Himalayas	—·105	— 8
Indus Valley and North-West Rajputana	—·109	— 7
East Rajputana, Central India, and Guzerat	—·090	—10
Deccan	—·000	—15
West Coast	+·003	— 4
Southern India	+·012	— 2

The variations of the amount of cloud from the normal were, as might be expected, similar in character to those of the humidlty variations. Skies were more or less clouded in Northern India during the first week or ten days of the month. They were generally free from cloud during this period in Central India, the Central

Provinces, and the Deccan. From the 11th to the 24th skies were unclouded over the whole of India with the exception of the coast districts, Burma and East Bengal. They then commenced to cloud over, the cloud extending from the coast districts into the interior. The following gives average data for the 24th and 30th for comparison :—

Province.	Cloud amount.		Province.	Cloud amount.	
	24th.	30th.		24th.	30th.
Bengal	6·2	8·7	Berar	7·5	9·5
Behar	8·0	8·8	Central India	0·3	6·3
Chutia Nagpur	5·0	1·0	Rajputana	0·7	3·0
N.-W. Provinces	0·9	6·0	Punjab	0	6·1
Central Provinces	1·6	6·1			

The mean cloud amount of the month was very largely in defect in the Punjab, North-West Provinces, Rajputana, Central India, the Central Provinces, Berar, and the Deccan. It was normal in Bengal, Behar and Assam, and in slight excess in Burma. The following table gives average data for the ten meteorological provinces in India :—

Meteorological Provinces.	Cloud amount.		
	Average actual in June 1891.	Normal average in June.	Variation from normal.
Burma Coasts and Bay Islands	9·0	8·2	+0·8
Assam	8·1	7·8	+0·3
Bengal and Orissa	6·7	7·3	—0·6
Gangetic Plain and Chutia Nagpur	4·1	5·3	—1·2
Upper Sub-Himalayas	1·2	3·4	—2·2
Indus Valley and North-West Rajputana	1·4	1·9	—0·5
East Rajputana, Central India, and Guzerat	1·9	4·5	—2·6
Deccan	4·0	6·1	—2·1
West Coast	6·1	7·3	—1·2
Southern India	6·2	7·2	—1·0

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 offices of the Meteorological Reporter, Director of Land Records, or other officer 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 June 1891 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.

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 160 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 indicating the rainfall.

Over a considerable portion of the country no rain fell. The line of no rainfall is indicated by two parallel lines separated by a short distance, one continuous and the other dotted, the latter facing the districts of no rainfall.

The second chart illustrating the distribution of the rainfall of the month is given in Plate V, and shows by figures the variation of the mean actual rainfall of the month from the normal rainfall in each of the 51 meteorological districts into which India and Burma has been divided for purposes of comparing crops and rainfall, &c. The data of this chart are deduced from the rainfall information telegraphed by district officers, of which a summary is given in the following table, and the actual figures utilized are those given in the last column. The numbers given in the centre of each district in the chart are the variations of the actual mean rainfall of the district from the normal mean rainfall; a number given in a corner of each district in small slanting figures serves as an index by means of which, on referring to the list of districts at the foot of the chart, the name of the district can be at once ascertained.

At the beginning of the month rain was falling generally in Malabar and South India and in Burma and Bengal. No change occurred until the 3rd, when humid winds from the Bay extended rapidly westwards up the Gangetic Plain. This influx of humid winds gave fairly general and moderate rain to Behar, Chutia Nagpur, the North-Western Provinces, and south-eastern districts of the Punjab during the next three days. The most remarkable feature of this inflow was the excessive local rainfall it gave to the Gorakhpur, Azamgarh and Ballia districts in the North-Western Provinces. The following gives data :—

District.	Number of rainfall recording stations.	Average rainfall of 24 hours preceding 8 A.M. of				
		4th.	5th.	6th.	7th.	Total.
Gorakhpur	6	5·78	1·99	2·52	2·09	12·38
Basti	5	0·51	0·27	0·17	...	0·95
Azamgarh	5	2·52	2·92	0·38	0·34	6·16
Ballia	3	1·08	3·78	1·56	0·60	7·02
Ghazipur	4	0·10	1·53	0·86	0·05	2·54

The rainfall in the neighbouring districts to those given in the table during this period in no case averaged more than one inch. There was undoubtedly a slight tendency to the establishment of a very shallow depression and feeble cyclonic circulation on the 6th and 7th in the eastern districts of the North-Western Provinces. It is very interesting as showing the tendency to the concentration of heavy rainfall and of the absence of any barometric indications of the ascensional movement necessary to produce heavy rainfall, and finally of the production of a very shallow depression and feeble cyclonic circulation after the occurrence, and almost certainly as a direct result of localised heavy rainfall for upwards of 48 hours.

The easterly humid current withdrew from the North-Western Provinces and Behar during the 9th and 10th, and from the 11th to the 27th or 28th dry weather prevailed over the whole of the Northern and Central India, with the exception of Assam and East and North Bengal, which continued to receive occasional showers. This partial withdrawal of the monsoon humid current from the Gangetic Plain was immediately followed by increased rainfall in Burma for four or five days. Akyab and the Bassein district received some excessive downpours during this period, of which the following were the most remarkable :—

DATE.	DISTRICT.	STATION.	Rainfall of 24 hours preceding 8 A.M. of date.
8th	Bassein	Kyonpyaw	11·10
	...	Ngathainggyaung	9·82
9th	...	Myaungmya	9·35
10th	...	Thigwin	19·04
	...	Bassein	10·91
11th	...	Thigwin	16·02
	...	Bassein	9·11
12th	Akyab	Akyab	8·02

The rains held steadily in Assam and Burma, except the central districts of Upper Burma, showers being received daily in all districts in these areas.

As already stated, Travancore and Malabar continued to receive daily rain during the second and third weeks of the month. In Mysore and South Madras, which had received light to moderate showers from the 1st to the 11th, the weather cleared on the 12th, and the next ten days were practically rainless in that area. On the 20th the first indications were shewn of increasing rainfall and of an advance of monsoon winds on the Malabar Coast. Rain slowly extended northwards along the coast. Karwar and Ratnagiri received rain on the 20th and Bombay on the 21st. The rainfall due to this advance was confined to the west coast districts and to Southern India until the 22nd, when it began to extend slowly inland. The Bombay-Deccan had light showers on that day, Berar on the 23rd, the Central Provinces on the 26th and 27th, and the south-eastern States of Central India on the 27th and 28th. These dates indicate clearly the slow eastward extension of the Bombay or Arabian Sea monsoon current across the head of the Peninsula. During the remainder of the month rain fell in moderate amounts in the coast districts and in light showers in the interior.

The Bay of Bengal current began to increase in strength on the 23rd and 24th. Cherra Punji in the Khasi Hills gave the earliest indications of the influx of aqueous vapour into Bengal. Its rainfall on the 22nd was 0·15 inch, and on the 23rd *nil*. On the 24th 6·5 inches were registered, and on the 25th, 9·46 inches. The latter was the largest amount recorded at that station during the month. The rainfall increased in amount in Burma from the 23rd and in Assam from the 28th. Bengal received general rain on the 25th and following days, and Behar and Chutia Nagpur on the 29th and 30th. The easterly humid current extended into the North-Western Provinces on the 29th, but rainfall was almost exclusively confined to the districts which had received exceptional rainfall between the 4th and 7th. Rainfall extended into Gurhwal and Kumaon and the adjacent plain districts on the 30th.

Plate IV shows the general character of the distribution of the rainfall of the month. The rainfall exceeded 20 inches in the Tenasserim and Burma Coast districts, the Assam hills and Malabar, and diminished in amount rapidly in passing into the interior. It was less than one inch in amount over nearly the whole of North-Western India, and was actually or practically *nil* in West Rajputana, Sind, Cutch and the South-West Punjab.

The following table gives comparative rainfall data for the 51 Meteorological districts into which India is divided :—

PROVINCE.	DIVISION.	AVERAGE ACTUAL RAINFALL OF DIVISION					Total rainfall during the month.	Normal average rainfall during the month.	Variation from normal.
		1st to 6th.	7th to 13th.	14th to 20th.	21st to 27th.	28th to 30th.			
		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
BURMA	Tenasserim	5·86	16·42	17·39	4·92	5·33	49·92	39·19	+ 10·73
	Lower Burma	3·10	16·31	5·11	3·36	1·79	29·67	18·71	+ 10·96
	Central do.	2·05	4·60	3·34	4·85	1·84	16·68	17·46	— 0·78
	Upper do.	1·85	2·53	1·49	0·87	0·30	7·04	?	?
	Arakan	3·74	10·15	4·47	1·61	4·36	24·33	44·66	— 20·33

Province.	Division.	Average actual rainfall of Division: 1st to 6th.	7th to 13th.	14th to 20th.	21st to 27th.	28th to 30th.	Total rainfall during the month.	Normal average rainfall during the month.	Variation from normal.
		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Bengal and Assam	Eastern Bengal	2·91	4·74	2·30	1·27	1·10	12·32	20·34	— 8·02
	Assam (Surma)	6·11	9·32	7·32	8·22	2·29	33·26	38·31	— 5·05
	Do. (Brahmaputra)	1·14	3·00	2·06	1·60	1·49	9·29	16·02	— 6·73
	Deltaic Bengal	2·24	1·87	0·30	0·21	0·91	5·53	10·84	— 5·31
	Central do.	1·87	1·74	0·50	0·74	1·26	6·11	10·29	— 4·18
	North do.	1·01	3·10	1·89	3·54	2·07	11·61	26·75	— 15·14
	Orissa	0·61	0·55	0·04	0·04	0·49	1·73	9·34	— 7·61
	Chutia Nagpur	1·53	0·76	0	0·10	1·10	3·49	8·85	— 5·36
	Behar (South)	2·98	0·87	0	0·23	1·44	5·52	6·94	— 1·42
	Do. (North)	3·79	2·43	0·03	0·71	1·52	8·48	10·21	— 1·73
North-Western Provinces and Oudh.	North-Western Provinces (East)	0·58	0·43	0	0	0·42	1·43	4·27	— 2·84
	Oudh (South)	0·13	0·12	0	0	0·09	0·34	5·32	— 4·98
	Do. (North)	0·52	0·29	0	0	0·75	1·56	6·22	— 4·06
	North-Western Provinces (Central)	0·03	0·36	0	0	0·07	0·46	4·19	— 3·73
	Do. do. (West)	0·03	0·47	0	0	0·23	0·73	3·56	— 2·83
	Do. do. (Submontane)	1·65	1·00	0	0	0·70	3·35	6·26	— 2·91
Punjab	Punjab (South)	0	0·15	0·04	0	0	0·19	1·75	— 1·56
	Do. (Central)	0	0·46	0·02	0	0·03	0·51	2·95	— 2·44
	Do. (Submontane)	0·15	0·55	0·03	0	0·08	0·81	3·43	— 2·62
	Do. (Hill Districts)	0	0·56	0·02	0	0·17	0·75	8·06	— 7·31
	Do. (North-West)	0	0·14	0·16	0	0·02	0·32	1·75	— 1·43
	Do. (West)	0·01	0·05	0·02	0	0·01	0·09	0·70	— 0·61
Bombay and Malabar Coast Districts (Madras).	Malabar	6·28	8·86	4·60	6·36	3·82	29·92	33·81	— 3·89
	Madras (South Central)	1·21	1·11	1·02	0·78	1·15	5·27	2·46	+ 2·81
	Coorg	2·14	4·47	2·01	1·36	4·51	14·49	26·15	— 11·66
	Mysore	1·23	0·08	2·23	0·08	0·53	4·15	3·43	+ 0·72
	Konkan	0·09	1·68	0·54	2·46	5·82	10·59	32·10	— 21·51
	Bombay Deccan	0·31	0·08	0·40	1·05	0·63	2·47	5·30	— 2·83
	Hyderabad (North)	...	...	...	...	...	...	...	...
	Khandeish	0	0	0·08	1·79	0·60	2·47	5·26	— 2·79
Central Provinces and Berar.	Berar	0·03	0	0	0·78	0·78	1·59	7·75	— 6·16
	Central Provinces (West)	0·15	0·02	0	0·30	1·11	1·58	7·75	— 6·17
	Do. (Central)	0·87	0·40	0·01	0·06	0·92	2·26	9·59	— 7·33
	Do. (East)	0·46	0·26	0·04	0·02	1·04	1·82	10·11	— 8·29
Bombay (North)	Guzerat	0	0·01	0·02	0·26	0·57	0·86	7·35	— 6·49
	Kathiawar	0	0	0·03	0·33	0·18	0·54	3·63	— 3·09
	Sind	0	0	0·05	0	0	0·05	0·25	— 0·20
Rajputana and Central India.	Central India (East)	0·04	0·11	0·01	0·11	0·43	0·70	6·45	— 5·75
	Rajputana (East), Central India (West)	0·14	0·15	0·01	0·05	0·19	0·54	3·75	— 3·21
	Rajputana (West)	0	0	0	0	0	0	1·60	— 1·60
Madras	East Coast (North)	0·64	0·06	0·04	0·35	0·65	1·74	4·59	— 2·85
	Do. (do.) (a)	1·03	0·10	0·05	0·30	0·45	1·93	?	?
	Hyderabad (South)	0·03	0·02	0·43	0·12	0·42	1·02	4·34	— 3·32
	Madras (Central)	0·16	0·08	0·75	0·23	0·11	1·33	2·28	— 0·95
	East Coast (Central)	0·13	0·03	0·18	0·42	0·32	1·08	3·22	— 2·14
	Do. (South)	0·48	0·27	0·41	0·12	0·23	1·51	1·78	— 0·27
	Madras (South)	0·25	0·14	0·44	0·07	0·06	0·96	1·09	— 0·13

The rains continued steadily in Tenasserim, Lower Burma, and Arakan during the whole month, and at a considerable number of stations rain fell on every day of the month. The rainfall was heavier in the first-half than in the latter half of the month. The heaviest falls in 24 hours were recorded at the great majority of stations between the 8th and 12th. The following were the largest:—

Date.	District.	Station.	Amount of 24 hours preceding 8 A.M. of date.
			Inches.
10th	Bassein	Thigwin	19·04
11th	Ditto	Ditto	16·02

Upper Burma received frequent showers from the 3rd to the 14th, but after that date little rain fell except in the hill districts (*e.g.*, the Ruby Mines, &c.). The following gives average rainfall data for the province:—

Province.	Division.	Total average rainfall of month.	Normal average rainfall of month.	Variation from normal.
Burma	Tenasserim	49·92	39·19	+ 10·73
	Lower Burma	29·67	18·71	+ 10·96
	Central Burma	16·68	17·46	— 0·78
	Upper Burma	7·04	?	?
	Arakan	24·33	44·66	— 20·33

These data show that the rainfall was largely in excess in Tenasserim and Lower Burma and normal in Central Burma. It was greatly in defect in Arakan, which received barely half its normal amount.

The chief feature in the distribution of rainfall in Upper Burma was its great irregularity, and the rainfall in many of the central districts was very small in amount, and in fact a great part of Upper Burma, including the districts of Minbu, Pokokku, Myingyan, and a portion of Thayetmyo, was almost as dry and rainless as the Punjab. The following gives rainfall at representative stations in these districts:—

District.	Station.	Total rainfall of month.
Pokokku	Pokokku	1·34
Myingyan	Pagan	0·32
Minbu	Salin	2·25

Pagan was the centre of this dry district.

The whole of Bengal, Behar, Chutia Nagpur and Orissa recorded general rain from the 1st to the 11th. The rainfall during this period was smallest in amount in Orissa and the central districts of Bengal, including Nuddea, Moorshedabad, Maldah, Dinagepore and Rungpore. Some heavy falls were received in North and Central Behar during this period, of which the more noteworthy were:—

Date.	District.	Station.	Rainfall of previous 24 hours.
4th	Chumparun	Bagaha	6·21 inches.
6th	Durbhanga	Tajpore	7·10 ,,
6th	Patna	Patna	5·45 ,,
9th	Mozufferpore	Hajipore	5·33 ,,
6th	Sarun	Sewan	5·24 ,,

The rainfalls at Tajpore and Bagaha given in the preceding statement were the largest amounts recorded in 24 hours during the month over the Province of Bengal. A long interval of dry weather extending from the 12th to the 27th or 28th followed. Practically no rain fell during this period in Orissa, South-West Bengal, Behar and Chutia Nagpur. East and North Bengal received occasional thunder showers, which were most frequent in the Jalpaiguri, Cooch Behar, and Mymensingh districts. General rain recommenced on the 28th in Bengal and Orissa, and extended on the 29th to the whole of Behar and Chutia Nagpur.

The rainfall of the month was very irregularly distributed, heavy rainfalls occurring at one station in a district, and little or no rain at the remaining raingauge stations in the same district.

The following gives a summary of the rainfall data of the Province of Bengal taken from the Bengal weather review of the month. The figures differ slightly from those given in page 183 in consequence chiefly of differences in the grouping of stations:—

Province.	District.	Rainfall actual average.	Normal average.	Variation.	Number of rainy days. Actual average.	Number of rainy days. Normal average.
Bengal.	East Bengal	12·97	18·16	—5·19	12·60	16·67
	South-West Bengal	6·17	10·14	—3·97	8·15	12·29
	North Bengal	9·38	17·57	—8·19	10·72	14·71
	Orissa	2·42	8·79	—6·37	4·87	9·90
	Chutia Nagpur	3·74	7·98	—4·24	5·82	10·67
	South Behar	5·63	6·75	—1·12	6·04	8·41
	North Behar	8·15	8·72	—0·57	7·81	8·90

The preceding data show that the deficiency relatively to the normal was greatest in Orissa. That area received less than one-fifth of its normal amount. It was greatest in the southern districts. The deficiency was also very considerable in Chutia Nagpur, where the average rainfall of the month was less than 47 per cent. of the normal amount. The deficiency was greatest in amount in the southern and western districts, over a portion of which the deficiency was nearly as large as in Orissa. In Bengal Proper the rainfall of the month was not only more irregularly distributed than usual, but was more or less in defect over the whole Province. The district averages show that the rainfall of the month ranged from about 30 to 70 per cent. of the normal average amounts. The rainfall was not only absolutely, but relatively to the normal, most largely in defect in these areas in which the rainfall is usually heaviest during the month, *viz.*, in North Bengal and the north-eastern districts of East Bengal.

The rainfall of the month was on the whole least in defect in North and South Behar, which received upwards of 80 per cent. of their normal amounts. The larger rainfall in Behar, as compared with Bengal, was in part due to some heavy downpours during the first rainfall period of the month.

There were two periods of rainfall in the North-Western Provinces and Oudh. The first was from the 3rd to the 11th, and the second from the 28th to the 31st, but over by far the greater part of the Province the rainfall was sporadic and small in amount. The chief feature was the excessive local rainfall during both periods in a small area, of which the Gorakhpur district was the centre, and which also included the Basti, Ballia, and Azamgarh districts. The following gives average rainfall data of the month for these four districts:—

Station.	Average actual rainfall of district of month.	Normal average rainfall of district in June.	Average actual No. of rainy days of month.	Normal average of rainy days in June.
Gorakhpur	17·3	6·7	7·8	7·4
Azamgarh	9·0	4·3	4·6	4·8
Ballia	9·4	4·6	6·7	5·6
Basti	7·1	6·3	6·0	6·7

The total rainfall of the month at the six recording stations in the Gorakhpur district ranged from 12·1 inches to 21·2 inches. The table shows that the number of rainy days during the month was practically normal. Over the remainder of the North-Western Provinces and Oudh the rainfall was universally in defect. The following statement gives data for each of the meteorological districts into which the province is divided:—

Province.	Meteorological Districts.	Rainfall.			No. of rainy days.	
		Average of month.	Normal of month.	Variation.	Average of month.	Normal of month.
North-Western Provinces.	North-Western Provinces, East.	1·43	4·27	−2·84	2·4	5·1
	North-Western Provinces, Central.	0·46	4·19	−3·73	1·1	4·2
	North-Western Provinces, West.	0·73	3·56	−2·83	1·2	3·7
	North-Western Provinces, Submontane.	3·35	6·26	−2·91	3·0	4·8
Oudh . .	Oudh, North . .	1·56	6·22	−4·66	2·0	5·6
	Oudh, South . .	0·34	5·32	−4·98	1·0	4·6

The Punjab received scattered showers (due to thunderstorms and duststorms), chiefly during the second week of the month and on the 29th and 30th. The total rainfall of the month was less than an inch, except at some stations in the submontane districts of Umballa, Ludhiana, Jullundar and Rawalpindi, and in the hill districts of Simla and Kangra. Over nearly the whole of the Province the rainfall of the month was small in amount and of no importance. In the western districts it averaged less than a tenth of an inch in amount.

The following table gives average rainfall data of the Punjab for the month:—

Province.	Meteorological District.	Rainfall.			No. of rainy days.	
		Actual average of month.	Normal average of month.	Variation.	Actual average.	Normal average.
Punjab .	Punjab, South . .	0·19	1·75	−1·56	0·9	2·0
	" Central .	0·51	2·95	−2·44	1·6	2·9
	" Submontane	0·81	3·43	−2·62	1·5	3·2
	" Hill Districts	0·75	8·06	−7·31	2·5	8·1
	" North-West	0·32	1·75	−1·43	1·0	2·6
	" West . .	0·09	0·70	−0·61	0·3	1·2

The average rainfall of the month of the whole Province was hence barely half an inch.

No rain fell in Beluchistan, Sind and West Rajputana. June, however, is usually a rainless month in those three divisions. East Rajputana, &c., obtained some light sporadic showers during the month (chiefly on the 7th and 8th). The total rainfall of the month was hence small in amount, and barely averaged half an inch. The normal average rainfall is 3·75 inches, and hence the rainfall of the month averaged only about one seventh of its normal amount.

The rains commenced a little later than usual on the Malabar Coast in the first week of June, and held steadily during the month. They did not, however, extend northwards to the Konkan until the fourth week of the month or upwards of a fortnight after their normal date. The rainfall of the month was very nearly normal in amount in Malabar. It received an average of 29·92 inches, or about 10 per cent. less than the normal. The Konkan obtained less than one-third of its normal, *viz.*, an average of 10·59 inches, or 21·51 inch less than the normal. The rains commenced somewhat feebly and without the very heavy downpour that sometimes occurs at the commencement of the monsoon. The rainfall of the Bombay-Deccan was almost as largely in defect relatively to the normal as in the Konkan. The deficiency was greatest in the northern districts. The whole area obtained an average of 2·47 inches or 45 per cent. of its normal amount.

The delay in the establishment of the monsoon current on the Bombay Coast was felt to a greater extent in Berar, the Central Provinces, Central India, and Kathiawar. Berar and the Central Provinces obtained some light showers from the 5th to the 8th, and again from the 27th to the 30th. The Raipur, Chanda, and the Khandwa districts received some heavy falls on the 28th. The heaviest was 6·51 inches at Burhanpur in the Khandwa district. The rainfall of the month was, except in those three districts, small in amount, and was less than an inch at 22 out of the 63 rainfall registering stations.

The following gives average data for these two provinces and shows that barely 20 per cent. of the normal amount was received:—

Province.	Meteorological District.	Rainfall.		
		Actual average of month.	Normal average of month.	Variation.
Berar	Berar	1·59	7·75	−6·16
Central Provinces .	Central Provinces, West.	1·58	7·75	−6·17
	" " Central.	2·26	9·59	−7·33
	Central Provinces, East .	1·82	10·11	−8·29

The following data show that the rainfall was deficient to an even greater extent in Guzerat, Kathiawar and Central India:—

Province.	Rainfall.		
	Actual average of month.	Normal average of month.	Variation.
	Inches.	Inches.	Inches.
Guzerat	0·86	7·35	−6·49
Kathiawar . . .	0·54	3·63	−3·09
Central India . . .	0·70	6·45	−5·75

The rainfall of the month was more or less in defect over nearly the whole of Madras. The deficiency was small in the southern districts and increased northwards. It was greatest in the northern coast districts which usually receive moderate rain during the month.

The following gives comparative data for the Madras Presidency :—

District.	Actual.	Normal.	Variation.	Percentage.
Malabar	29·92	33·81	—3·89	— 12
Madras, South	0·96	1·09	—0·13	— 12
" South Central	5·27	2·46	+2·81	+114
" Central	1·33	2·28	—0·95	— 42
East Coast, South	1·51	1·78	—0·27	— 15
" Central	1·08	3·22	—2·14	— 66
" North	1·74	4·59	—2·85	— 62

Mysore received slightly more than its normal amount, but the rainfall was very irregularly distributed.

The following gives a statement of the rainfall data of that State:—

District.	Rainfall.		Number of rainy days.	
	Actual.	Average.	Actual.	Average.
Bangalore	4·96	2·26	7	4·2
Kolar	2·59	2·31	5	3·7
Tumkur	4·11	2·17	5	3·9
Mysore	4·01	1·54	6	4·4
Shimoga	5·06	13·03	8	14·0
Kadur	6·12	10·44	10	14·6
Hassan	4·89	4·16	8	9·3
Chittaldroog	3·36	1·56	4	4·1

The chief periods of rainfall in Mysore was from the 1st to the 4th and from the 14th to the 19th.

Explanation of Tables.

Table I gives an abstract of the meteorological observations at 8 A.M. daily, taken at 159 stations in India during the month of June 1891.

In this table the observing stations are grouped under two sets of divisions. According to the first arrangement India and Burma are divided into eleven large meteorological areas or provinces. These divisions have been selected in consultation with the Medical Department. The climatic conditions of each area are fairly uniform, and they hence are presumed to form suitable areas for the discussion of the relations between disease and meteorology. The names of these divisions are printed in bold type, and the mean variations of the more important meteorological data, more especially temperature, are given opposite to each in prominent figures.

Each of these larger divisions is subdivided into smaller meteorological areas or districts, of which there are 51 in all. This subdivision was made in consultation with the Revenue and Financial Departments. In each of these smaller areas the distribution and character of the rainfall are fairly uniform, and the staple crops in each are hence the same. This subdivision will, it is hoped, enable a more exact comparison to be made between crops and rainfall than has been hitherto possible.

The headings of the columns in the great majority of cases explain themselves. The figures in the third column "variation from normal" are obtained by taking in each case the difference between the mean actual barometer (reduced for temperature, but not to sea-level or constant gravity) and the normal means obtained from the observations of the eleven years' period, 1878-88.

The "mean daily temperature" is assumed in Table I to be the mean of the maximum and minimum. It is chiefly utilized in order to obtain the mean variation of the temperature of the month from the normal.

In obtaining the figures for the column headed "Number of rainy days," a rainy day is assumed to be one on which a fall of a tenth of an inch or upwards has been recorded. A fall of less than a tenth of an inch is practically of no value for agricultural purposes in India, and it has not been found possible to secure the accurate record of rainfalls of less than a tenth of an inch at a great majority of the rainfall recording stations.

Table II gives an abstract of the observations recorded at 10 A.M. and 4 P.M. at 89 second class observatories throughout India, Burma, and the adjacent regions. This table is intended in part to supplement Table I, and hence information given in full in the latter table, as, for example, rainfall, is not included in Table II. This table is intended to give for the month, so far as is possible, all the information furnished hitherto in the Appendix A of the Annual Report on the Meteorology of India. The methods of calculating the means have been very fully explained in the Annual Reports, to which the reader is referred for complete information. The data of the mean daily pressure, the figures of which are given in the sixth column, are the means of the 10 and 16 hours' observations, with corrections obtained from a comparison of the 10 and 16 hours' observation of the same or a neighbouring observatory, with a series of hourly observations at the same observatory.

The mean temperature is calculated by the formula

$$\text{mean} = \frac{\textit{maximum} + \textit{16 hours} + \textit{2 minimum}}{4}$$ by applying a constant correction for each month, derived from the hourly observations of the same or of a neighbouring station.

The mean daily vapour tension and humidity are the averages of the values for 10 A.M., 4 P.M., and the minimum readings and the mean daily cloud is the average of the mean amounts for 10 and 16 hours.

The mean wind direction for each month is the trigonometrical resultant of the winds given under each of the eight cardinal points, and are calculated by means of Lambert's formula, in which an equal weight or value is given to every wind.

It should be noted that in the preceding discussion, in speaking of the maximum, minimum, or mean temperature, the total amount of wind or the rainfall of a given day, as, for example, the 5th, tne maximum, &c., of the 24 hours preceding 8 A.M. of the 5th is meant. This definition has been adopted to avoid confusion. As the observations are taken at 8 A.M., a part of them refer to 8 A.M. of that day and a part to the previous twenty-four hours, and, therefore, including a portion of the previous civil day. It is found most convenient to use the same date to designate and define both classes of observations.

Table

Abstract of Observations taken at 8 A.M. at 159

Meteorological Province or District.	Station.	Height of Station in feet.	Pressure 8 A.M. in inches. 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.	Temperature of Air. 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.		...	...	−·018	...			...	...	...		85·7	+0·6	75·2	−0·3	80·5	+0·2	10·6	...	...	...	...	19·5
Bay Island	Port Blair	61·16	29·761	?	29·753	29·859	1st	29·670	21st	·189	81·8	85·5	?	78·3	?	81·9	?	7·2	88·3	21st	73·6	5th	14·7
Tenasserim	Mergui	96·27	29·756	?	29·784	29·836	2nd	29·669	21st	·167	77·5	84·1	?	70·4	?	77·5	?	13·7	89·1	7th & 12th.	67·0	30th	22·1
	Tavoy	26·26	29·842	?	29·802	29·926	1st	29·786	21st	·140	77·2	83·3	?	74·5	?	78·9	?	8·8	87·2	11th & 12th.	72·2	30th	15·0
	Moulmein	93·79	29·706	−·022	29·739	29·809	2nd	29·642	21st	·167	77·8	84·5	+0·5	74·9	+0·5	79·7	+0·5	9·6	91·5	24th	70·3	15th	21·2
	Toungoo	181·1	29·575	−·020	29·700	29·683	1st & 2nd	29·483	10th	·200	79·3	89·5	+1·4	75·5	+0·4	82·5	+0·9	14·0	96·7	4th	71·7	16th	25·0
Lower Burma	Rangoon	40·69	29·734	−·027	29·713	29·852	2nd	29·658	12th	·194	78·6	?	?	75·7	−0·7	?	?	?	?	?	72·9	10th & 13th.	?
	Bassein	21	29·751	−·013	29·710	29·857	2nd	29·665	12th	·192	78·4	85·6	−0·5	74·6	−1·6	80·2	−1·1	11·0	91·7	2nd	71·9	12th & 15th.	19·8
	Diamond Island.	41	29·738	−·014	29·716	29·830	2nd	29·656	11th	·174	81·5	86·0	+0·6	72·7	−3·2	79·4	−1·3	13·3	89·8	3rd	66·6	15th	23·2
Arakan	Akyab	20·44	29·697	−·009	29·662	29·840	2nd	29·577	11th	·263	81·3	87·1	+1·2	80·3	+2·6	83·7	+1·9	6·8	89·2	8 days.	74·1	12th & 13th.	15·1
II.—Burma, Inland		...	...	−·017	...	...	...	...	...	...		92·7	+1·6	76·0	−1·4	84·4	+0·1	16·7	...	...	...	...	28·2
Central Burma	Thayetmyo	134	29·598	−·017	29·675	29·719	2nd	29·493	11th	·226	81·2	92·4	+1·6	75·0	−1·4	83·7	+0·1	17·4	97·7	1st & 4th.	71·0	13th	26·7
Upper Burma	Mandalay	?	29·452	?	?	29·581	2nd	29·372	10th	·209	81·8	98·3	?	79·1	?	88·7	?	19·2	104·9	4th	74·5	15th	30·4
	Kindat	?	29·316	?	?	29·498	3rd	29·182	21st	·316	81·0	90·1	?	75·4	?	82·8	?	14·7	98·8	21st	70·0	1st	28·8
	Bhamo	?	29·269	?	?	29·430	3rd	29·125	12th	·305	78·6	85·9	?	74·5	?	82·2	?	15·4	96·1	18th, 19th & 20th.	69·1	3rd	27·0
III.—Assam		...	...	−·014	...	...	...	...	...	...	...	87·5	−0·7	75·9	−0·6	81·7	−0·7	11·6	...	...	...	...	21·1
Assam (Surma)	Silchar	104·3	29·570	−·010	29·624	29·699	3rd	29·430	11th	·269	80·1	89·5	+0·8	75·9	−0·2	82·7	+0·3	13·6	94·0	5th	70·3	15th	23·7
Brahmaputra	Sibsagar	333	29·327	−·021	29·613	29·487	3rd	29·193	13th	·294	79·5	87·7	−2·3	76·4	−0·2	82·1	−1·3	11·3	94·1	23rd & 25th.	73·0	17th	21·1
	Dhubri	115·34	29·517	−·011	29·586	29·675	2nd	29·363	13th	·312	78·0	85·2	−0·7	75·3	−1·3	80·3	−1·0	9·9	90·2	19th	71·8	5th & 21st.	18·4
IV.—Bengal and Orissa		...	...	−·005	...	...	...	...	...	...	...	91·8	+1·4	78·1	+0·9	85·0	+1·2	13·7	...	...	...	...	26·0
East Bengal	Chittagong	86·7	29·591	−·007	29·625	29·696	3rd	29·472	11th	·224	82·5	88·0	+1·9	77·7	+1·3	82·9	+1·6	10·3	90·7	23rd	71·1	17th	19·6
	Lungleh	?	?	?	?	?	...	?	...	?	70·1	72·6	?	46·7	?	59·7	?	25·9	73·9	5 days.	36·4	4th	37·5
	Noakhally	42·73	29·612	?	29·602	29·734	2nd	29·497	11th & 12th.	·237	82·4	87·8	?	78·6	?	83·2	?	9·2	91·5	23rd	69·8	17th	21·7
	Comillah	34·75	29·618	?	29·601	29·734	2nd	29·490	12th	·244	82·4	89·2	?	76·9	?	83·0	?	12·3	92·3	21st & 23rd.	70·8	17th	21·5
	Serajganj	46·37	29·572	?	29·567	29·730	3rd	29·434	13th	·296	81·9	89·7	?	76·6	?	83·2	?	13·1	94·6	13th	70·7	17th & 24th.	23·9
	Dacca	21·7	29·606	−·008	29·575	29·735	1st	29·479	12th	·256	83·4	90·1	+1·1	79·4	+1·1	84·8	+1·1	10·7	94·1	13th	72·2	16th	21·9
	Burrisal	12	29·620	−·003	29·577	29·746	2nd	29·482	12th	·264	84·5	91·0	+2·8	79·5	+2·1	85·2	+2·5	11·5	94·8	13th & 19th.	74·9	4th	19·9
	Mymensingh	55·18	29·583	−·004	29·591	29·715	3rd	29·449	12th	·266	79·6	86·0	−1·8	76·1	−0·9	81·0	−1·4	9·9	91·7	19th & 23rd.	69·6	13th	22·1
Deltaic Bengal	Furreedpore	39	29·592	?	29·579	29·715	2nd	29·459	12th	·256	83·8	90·2	?	78·9	?	84·6	?	11·3	94·5	13th & 15th.	72·9	2nd & 9th.	21·6
	Jessore	33·29	29·574	−·014	29·553	29·711	2nd	29·442	12th	·269	84·7	92·1	+0·4	80·2	+1·4	86·2	+0·9	11·9	97·2	15th	75·4	4th	21·8
	Calcutta	21·38	29·578	−·001	29·544	29·699	2nd	29·462	12th	·237	84·8	93·6	+2·2	80·2	+1·4	86·9	+1·8	13·4	98·1	13th & 15th.	74·2	8th & 28th.	23·9
	Saugor Island	25·3	29·580	−·001	29·549	29·684	2nd	29·471	12th	·213	86·6	92·5	+1·7	83·3	+1·3	87·9	+1·5	9·2	94·2	2nd & 20th.	75·5	4th	18·7
	Kishnaghur	46·64	29·545	?	29·539	29·670	2nd	29·419	13th	·251	84·9	94·6	?	80·0	?	87·4	?	14·6	100·7	22nd	72·7	2nd	28·0
	Midnapore	148·88	29·448	?	29·542	29·561	1st	29·353	13th	·208	85·4	98·5	?	79·7	?	89·1	?	18·8	105·4	4 days.	70·2	2nd	35·2
Central Bengal	Bankoora	300	29·274	?	29·519	29·403	2nd	29·172	13th	·231	84·3	98·7	?	79·4	?	89·1	?	19·3	108·6	21st & 22nd.	68·6	5th	40·0
	Raneegunge	345·15	29·254	?	29·544	29·399	2nd	29·141	13th	·258	84·2	98·7	?	79·9	?	89·1	?	18·8	110·5	23rd	72·4	4th & 5th.	38·1
	Burdwan	99·09	29·501	+·003	29·546	29·639	2nd	29·370	13th	·269	84·1	95·8	+1·4	80·7	+1·3	88·3	+1·4	15·1	102·7	14th	74·9	2nd	27·8

I.

stations in India, Burma, &c., in June 1891.

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 30th June.	Normal rainfall for period 1st to 30th June.	Variation from normal of period.	Station.	Meteorological Province or District.
...	...	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	31·87	27·38	+4·49	...	...	...	**I.—Burma Coast and Bay Islands.**	
2	...	...	...	...	1	14	13	...	12	10	+20	87	·915	8·6	21	...	...	22·51	18·79	+3·72	22·51	18·79	+3·72	Port Blair .	Bay Island.
...	...	...	...	1	1	23	...	5	2	2	0	94	·883	9·5	27	...	...	32·83	31·44	+1·39	32·83	31·44	+1·39	Mergui .	Tenasserim.
18	1	1	...	1	1	6	1	1	3	?	?	93	·869	8·9	30	...	...	44·60	40·02	+4·58*	44·60	40·02	+4·58*	Tavoy.	
...	...	...	3	14	8	2	2	1	5	3	+67	93	·881	7·3	24	...	...	49·78	36·21	+13·57	49·78	36·21	+13·57	Moulmein.	
...	...	...	...	19	11	...	...	...	6	5	+20	91	·916	9·3	15	..	...	7·64	15·17	−7·53	7·64	15·17	−7·53	Toungoo.	
..	..	1	1	1	3	15	9	..	4	5	−20	93	·917	9·2	22	...	...	26·36	18·10	+8·86	26·96	18·10	+8·86	Rangoon .	Lower Burma.
8	...	1	2	3	6	5	4	1	5	4	+25	94	·917	8·1	27	..	...	40·73	22·31	+18·42	40·73	22·31	+18·42	Bassein.	
1	2	...	1	1	4	18	2	1	7	9	−22	84	·912	8·1	21	...	...	30·25	23·63	+6·62	30·25	23·63	+6·62	Diamond Island.	
...	1	1	8	6	12	...	2	...	4	4	0	91	·968	9·2	20	..	...	31·49	40·79	−9·30	31·49	40·79	−9·30	Akyab .	Arakan.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	9·81	9·33	+0·47	...	...	...	**II.—Burma, Inland.**	
...	...	...	...	2	26	2	...	...	9	8	+13	82	·871	8·1	10	...	..	5·59	7·04	−1·45	5·59	7·04	−1·45	Thayetmyo .	Central Burma.
1	...	...	4	1	24	...	...	...	?	?	?	78	·922	7·2	7	...	...	2·79	6·60	−3·81	2·79	6·60	−3·81	Mandalay .	Upper Burma.
23	...	2	...	...	1	2	...	2	2	?	?	91	·961	3·0	12	...	...	17·52	7·97	+9·55	17·52	7·97	+9·55	Kindat.	
3	...	9	...	1	...	6	4	7	...	?	?	88	·863	7·9	17	...	...	13·32	15·72	−2·40	13·32	15·72	−2·40	Bhamo.	
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	.	...	14·26	20·03	5·78	...	...	...	**III.—Assam.**	
18	1	2	5	2	2	...	...	...	1	3	−67	89	·911	8·9	22	...	...	16·99	21·36	- 4·37	16·99	21·36	−4·37	Silchar .	Assam (Surma).
1	...	13	1	9	...	6	...	...	2	3	−33	94	·956	8·9	23	...	...	11·42	13·36	−1·94	11·42	13·36	−1·94	Sibsagar .	Brahmaputra.
5	1	10	8	2	...	3	...	1	5	5	0	91	·870	8·8	18	...	...	14·36	25·38	−11·02	14·36	25·38	−11·02	Dhubri.	
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	7·71	13·19	- 5·82		...	...	**IV.—Bengal and Orissa.**	
1	...	...	3	16	9	1	...	...	6	7	−14	84	·941	7·3	10	..		8·36	23·44	−15·08	8·36	23·44	−15·08	Chittagong .	East Bengal.
Not recorded.									?	?	?	92	·681	?	20	...	...	19·79	?	?	19·79	?	?	Lungleh.	
1	...	...	5	14	9	1	..	...	8	?	?	88	?	3·9	16	...	...	15·85	23·72	−7·87	15·85	23·72	−7·87	Noakhally.	
...	...	...	2	10	18	...	...	...	6	?	?	86	?	3·9	13	...	...	10·67	18·45	−7·78	10·67	18·45	−7·78	Comillah.	
...	...	2	6	13	9	...	...	...	4	?	?	92	?	8·2	14	...	...	12·79	?	?	12·79	?	?	Serajganj.	
...	...	1	3	9	15	2	...	...	8	7	+14	89	1·019	8·3	13	...	...	15·45	12·25	+3·20	15·45	12·25	+3·20	Dacca.	
5	...	1	1	3	15	5	...	...	5	?	?	85	1·018	5·6	8	...	...	5·76	16·23	−10·47	5·76	16·23	−10·47	Burrisal.	
...	...	5	12	12	1	...	...	...	6	?	?	92	·929	8·2	20	...	...	15·69	18·78	−3·09	15·69	18·78	−3·09	Mymensingh.	
2	1	1	2	7	17	...	...	...	6	?	?	90	?	6·5	10	...	...	9·92	13·12	−3·20	9·92	13·12	−3·20	Furreedpore .	Deltaic Bengal.
6	...	1	1	11	10	1	...	...	5	5	0	89	1·064	9·0	10	...	...	6·77	11·69	−4·92	6·77	11·69	−4·92	Jessore.	
2	...	1	1	4	15	6	1	...	6	6	0	84	1·002	6·5	9	...	...	5·93	9·27	−3·34	5·93	9·27	−3·34	Calcutta.	
...	...	2	...	1	20	4	3	...	17	15	+13	82	1·046	7·6	8	...	...	10·06	9·29	+0·77	10·06	9·29	+0·77	Saugor Island.	
2	...	1	3	8	12	2	1	1	7	?	?	83	?	6·5	6	...	...	7·02	9·51	- 2·49	7·02	9·51	−2·49	Kishnaghur.	
2	...	1	3	...	21	...	...	...	9	?	?	79	?	2·6	8	...	...	4·98	9·50	−4·57	4·93	9·50	−4·57	Midnapore.	
4	...	1	4	3	10	...	7	1	5	?	?	81	?	4·5	7	...	...	4·90	9·81	−4·91	4·90	9·81	−4·91	Bankoora .	Central Bengal.
6	...	3	4	4	5	5	2	1	2	?	?	80	?	5·3	8	...	...	6·08	?	?	6·08	?	?	Raneegunge.	
3	...	...	1	2	15	7	2	...	5	5	0	81	·949	6·5	7	...	...	2·85	7·64	−4·79	2·85	7·64	−4·79	Burdwan.	

* Mean of 29 days.

Table

Abstract of Observations taken at 8 A.M. at 159 stations

Meteorological Province or District.	Station.	Height of Station in feet.	Pressure 8 A.M. in inches. 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.	Temperature of Air. 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.
Central Bengal —*contd.*	Nya Doomka	490	29·090	?	29·527	29·233	2nd	28·962	13th	·271	85·8	97·1	?	79·8	?	88·5	?	17·3	108·2	22nd	71·3	5th	36·9
	Berhampore	66·45	29·518	−·018	29·533	29·659	2nd	29·387	13th	·272	82·4	94·1	+1·5	79·3	+0·8	86·7	+1·2	14·8	101·2	16th	74·3	3rd	26·9
	Rampore Bauleah.	70	29·525	?	29·544	29·665	2nd	29·386	13th	·279	83·4	91·5	?	78·9	?	85·2	?	12·6	98·8	16th	71·7	18th	27·1
	Maldah .	80	29·529*	?	29·560*	29·659	2nd	29·447	15th	·212	84·4*	94·1†	?	79·4†	?	86·8†	?	14·7	100·0	15th & 16th.	72·5	11th	27·5
	Bogra .	61·48	29·538	+·002	29·551	29·676	2nd	29·395	13th	·281	82·0	89·7	+0·2	76·3	−1·3	83·2	−0·6	13·4	95·3	13th & 15th.	71·2	18th	24·1
North Bengal	Dinagepore .	117·59	29·487	−·025	29·557	29·645	2nd	29·330	13th	·315	80·9	90·7	+1·4	77·5	+1·0	84·1	+1·2	13·2	97·1	16th	73·7	13th	23·4
	Rungpore .	123	29·509	?	29·585	29·662	2nd	29·368	12th	·294	80·6	89·3	?	76·3	0	82·8	?	13·0	92·8	13th & 22nd.	71·7	13th	21·1
	Jalpaiguri .	283·7	29·357	−·004	29·593	29·512	2nd	29·253	13th	·259	79·8	87·9	+0·7	75·4	+1·2	81·7	+1·0	12·5	91·9	20th	71·1	13th	20·8
Orissa	Balasore .	53·98	29·537	−·002	29·537	29·648	2nd	29·448	13th	·200	84·8	94·4	+1·1	78·6	+0·4	86·5	+0·8	15·8	101·5	17th	71·8	2nd	29·7
	False Point .	20·60	29·598	+·001	29·560	29·679	3rd	29·517	12th	·162	86·5	92·3	+1·3	81·2	+1·0	86·8	+1·2	11·1	101·0	10th	75·6	2nd & 30th	25·4
	Cuttack .	80	29·531	+·006	29·552	29·608	2nd	29·464	12th	·144	87·3	101·4	+5·3	81·7	+1·5	91·6	+3·4	19·7	107·9	21st	73·8	4th	34·1
	Shortt's Island	?	29·559	?	?	29·648	2nd	29·483	12th	·165	86·2	91·1	?	82·1	?	86·6	?	9·0	98·7	10th	75·6	1st	23·1
	Pooree .	11·99	29·589	?	29·538	29·676	3rd	29·474	28th	·202	85·1	90·3	?	82·6	?	86·5	?	7·7	93·2	14th	73·6	4th	19·6
V.—Gangetic Plain and Chutia Nagpur.		...	...	−·002	...	...	...	...	...	...	...	98·6	+0·3	80·0	−0·2	89·3	0	18·5	...	...	...	...	3·40
Chutia Nagpur	Hazaribagh	2,007·12	27·609	+·002	29·512	27·712	2nd	27·508	12th	·204	87·7§	100·1§	?	?	?	?	?	?	105·1	25th	?	?	?
	Ranchee .	2,128·14	27·494	?	29·515	27·592	2nd	27·407	12th	·185	83·7	96·9	?	76·3	?	86·7	?	20·6	105·0	25th	68·9	4th	36·1
	Chybassa .	760	28·826	?	29·519	28·943	2nd	28·763	12th	·180	86·6	103·2	?	80·9	?	92·1	?	22·3	111·3	22nd, 23rd & 25th.	74·7	4th	36·6
Behar (South)	Gya .	374·5	29·191	−·006	29·511	29·337	2nd	29·072	12th	·265	88·1	101·7	+1·5	82·2	+3·2	91·9	+2·3	19·5	110·6	23rd & 25th.	70·8	5th	39·8
	Dehree .	351·14	29·210	?	29·506	29·360	2nd	29·080	12th	·280	89·5	102·8	?	81·7‡	?	92·1§	?	21·1	110·9	21st, 22nd & 24th.	73·0	5th	37·9
	Patna .	182·84	29·380	−·021	29·512	29·569	2nd	29·258	12th & 13th	·311	85·3	96·4	−0·6	80·0	−0·2	88·2	−0·4	16·4	105·6	21st	72·2	6th	33·4
	Arrah .	190·02	29·367	?	29·506	29·542	2nd	29·245	13th	·297	85·9	97·8	?	80·2	?	89·0	?	17·6	106·4	21st	71·7	4th & 6th	34·7
	Buxar .	239·22	29·313	?	29·501	29·488	2nd	29·192	12th	·296	87·2	98·4	?	81·2	?	89·8	?	17·2	106·9	21st, 22nd & 23rd.	71·8	4th	35·1
Behar (North)	Purneah .	125	29·470	−·006	29·546	29·637	2nd	29·326	13th	·311	81·4	91·2	−1·5	76·2	−0·7	83·7	−1·1	15·0	96·2	21st	72·2	11th	24·0
	Bhagalpur .	159·78	29·410	?	29·521	29·579	2nd	29·284	13th	·295	84·4	93·8	?	79·2	?	86·5	?	14·6	101·3	16th	74·0	5th & 11th	27·3
	Durbhunga .	166·32	29·431	0	29·549	29·606	2nd	29·316	12th	·290	82·9	92·6	+0·2	79·1	+0·2	85·8	+0·2	13·5	99·9	21st	73·5	4th	26·4
	Mozufferpore	178·42	29·383	?	29·513	29·571	2nd	29·263	13th	·308	82·9	93·7	?	79·6	?	86·7	?	14·1	101·4	21st	72·2	6th	29·2
	Motiharee .	223·61	29·349	?	29·528	29·536	2nd	29·217	13th	·319	84·6	92·9	?	77·9	?	85·4	?	15·0	100·2	19th, 20th & 21st.	70·8	4th	29·4
	Chupra .	181·3	29·373	?	29·504	29·556	2nd	29·248	12th	·308	85·3	97·4	?	79·7‡	?	88·5‡	?	17·7	105·3	21st	72·7	5th & 6th.	32·6
N.-W. P. (Eastern Districts).	Benares .	266·97	29·298	+·007	29·518	29·453	2nd	29·197	12th	·256	87·2	103·4	+2·0	81·2	−1·3	92·3	+0·4	22·2	111·8	22nd	75·0	4th	36·8
	Allahabad .	309·28	29·256	+·004	29·516	29·390	2nd	29·152	12th	·238	89·9	106·6	+3·8	82·3	−0·8	94·4	+1·5	24·3	112·9	21st & 22nd.	73·6	4th	39·3
N.-W. P. (Eastern Submontane).	Gorakhpur .	255·93	29·308	−·005	29·522	29·519	2nd	29·175	13th	·344	83·4	94·1	−4·4	78·6	−1·4	86·4	−2·9	15·5	103·3	18th & 19th.	70·2	4th	33·1
Oudh (South)	Lucknow .	369·4	29·202	+·006	29·526	29·344	2nd	29·081	12th‖	·263	88·2	103·2	+1·1	80·7	−0·9	92·0	+0·1	22·5	111·3	23rd & 25th.	70·8	4th	40·5
N.-W. Provinces (Central).	Cawnpore .	415·57	29·135	?	29·501	29·242	2nd	29·030	28th	·212	90·3	107·0	?	83·3¶	?	95·3¶	?	23·7	113·1	26th & 28th.	74·1	5th	39·0
VI.—Upper Sub-Himalayas		...	...	+·007	..	...	...	...	...	...	..	104·3	+1·5	77·9	−1·4	91·1	0	26·4	..	...	...	...	41·2
N.-W. Provinces (Submontane).	Bareilly .	568·47	28·989	+·003	29·514	29·137	2nd	28·875	13th	·262	87·2	103·2	+2·0	79·6	−0·5	91·4	+0·8	23·6	110·5	24th	71·6	30th	38·9
	Dehra Dun .	2,232·4	27·387	?	29·541	27·523	2nd	27·271	13th	·252	79·6	95·8	?	73·4	?	84·6	?	22·4	103·0	24th	65·0	17th	38·0
	Roorkee .	886·63	28·681	+·009	29·521	28·810	2nd	28·554	13th	·256	85·3	102·9	+1·2	77·0	−2·1	90·0	−0·5	25·9	110·2	25th	71·1	7th & 30th.	39·1
	Meerut .	737·48	28·831	+·018	29·522	28·951	7th	28·721	12th	·230	87·6	104·5	+2·9	78·7	−2·4	91·6	+0·3	25·8	110·[illegible]	25th & 26th.	71·9	17th	38·3
Punjab (Central)	Delhi .	717·81	28·854	+·023	29·521	28·964	7th	28·747	12th	·217	89·8	105·1	+0·5	83·0	−0·5	94·1	0	22·1	111·0	27th & 28th.	74·1	6th	36·9
	Lahore .	702·2	28·819	0	29·477	28·943	18th	28·680	29th	·263	90·6	108·7	+2·6	77·8	−2·9	93·3	−0·2	30·9	115·	26th & 27th.	68·5	1st	46·8

* Mean of 23 days and also 23 days' wind direction observations.
† „ „ 27 „
‡ „ „ 29 „
§ Mean of 20 days.
‖ „ „ 18 „
¶ „ „ 26 „

I—*continued.*

in India, Burma, &c., in June 1891—continued.

Wind Direction. Number of winds from									Wind Velocity.			Hygrometry, 8 A.M.			Rainfall.									
Calm.	N.	NE.	E.	SE.	S.	SW.	W.	NW.	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.	Normal rainfall for period 1st to 30th June.	Variation from normal of period.	Station.	Meteorological Province or District.
3	1	3	6	7	6	2	2	...	5‡	?	?	74	?	2·9	5	...	...	5·89	8·91	− 5·02	3·89	8·91	− 5·02	Nya Doomka.	Central Bengal —*contd.*
...	1	1	6	6	13	3	...	...	5	5	0	91	1·010	7·6	10	...	...	4·20	8·39	− 4·19	4·20	8·39	− 4·19	Berhampore.	
1	...	2	5	9	12	1	...	...	5	?	?	88	?	6·0	11	...	...	8·51	10·65	− 2·14	8·51	10·65	− 2·14	Rampore Bauleah.	
...	...	...	13	9	1	...	...	...	3	?	?	88*	?	4·9*	7	...	...	6·33	9·86	− 3·53	6·33	9·86	− 3·53	Maldah.	
4	...	2	14	10	...	...	...	...	4	?	?	88	·967	7·4	14	...	...	8·82	13·82	− 5·00	8·82	13·82	− 5·00	Bogra.	
...	...	6	13	8	2	...	...	1	1	?	?	89	·931	8·8	8	...	...	3·51	16·42	−12·91	3·51	16·42	−12·91	Dinagepore.	North Bengal.
1	1	2	22	3	1	...	...	...	4	?	?	88	?	3·1	9	...	...	10·94	21·31	−10·37	10·94	21·31	−10·37	Rungpore.	
Not observed.									4	?	?	88	·896	3·3	15	...	...	9·74	28·49	−18·75	9·74	28·49	−18·75	Jalpaiguri.	
2	...	1	1	...	13	11	2	...	7	?	?	82	·980	3·8	10	...		5·32	8·80	− 3·48	5·32	8·80	− 3·48	Balasore.	Orissa.
1	...	1	...	...	15	10	2	1	12	12	0	82	1·037	7·6	5	...	...	2·59	6·54	− 3·95	2·59	6·54	− 3·95	False Point.	
3	...	...	...	1	9	16	1	...	4	4	0	74	·954	6·4	7	...	...	2·73	9·40	− 6·67	2·73	9·40	− 6·67	Cuttack.	
...	...	...	...	...	4	17	8	1	13	?	?	82	1·026	6·1	2	...	...	1·04	?	?	1·04	?	?	Shortt's Island.	
1	2	...	...	...	6	17	4	...	15	?	?	88	?	4·4	2	...	...	0·88	7·72	− 6·84	0·88	7·72	− 6·84	Pooree.	
...	...	...	...	...	...	...	...		...	...	...	...	...	...	...	...	...	5·27	6·94	−1·62	...	...	...	**V.—Gangetic Plain and Chutia Nagpur.**	
...	...	...	1	2	9	7	8	3	10	9	+11	45§	·557§	5·7	6	...	...	3·88	7·37	− 3·49	3·88	7·37	− 3·49	Hazaribagh.	Chutia Nagpur.
9	..	...	...	...	3	11	6	1	6	?	?	60	?	4·2	8	...	...	2·40	7·72	− 5·32	2·40	7·72	− 5·32	Ranchee.	
3	...	1	1	...	4	12	8	1	2	?	?	63	?	3·2	5	...	...	3·82	8·41	− 4·59	3·82	8·41	− 4·59	Chybassa.	
...	2	...	14	...	6	1	6	1	5	3	+67	76	1·017	5·4	5	...	...	6·35	6·51	− 0·16	6·35	6·51	− 0·16	Gya.	Behar (South).
4	1	3	7	2	2	3	6	2	8‡	?	?	56‡	?	3·1	6	...	...	4·47	?	?	4·47	?	?	Dehree.	
2	...	...	23	1	...	...	4	...	6	4	+50	75	·912	4·6	8	...	...	10·51	6·80	+ 3·71	10·51	6·80	+ 3·71	Patna.	
2	...	8	9	2	...	1	5	3	2	?	?	70	?	1·9	7	...	...	7·30	6·51	+ 0·79	7·30	6·51	+ 0·79	Arrah.	
..	...	3	11	2	...	1	5	8	7	?	?	62	?	3·8	3	...	...	1·93	4·99	− 3·06	1·93	4·99	− 3·06	Buxar.	
9	3	7	8	3	...	...	...	...	2	3	−33	88	·940	6·8	10	...	...	5·94	11·85	− 5·91	5·94	11·85	− 5·91	Purneah.	Behar (North).
16	1	2	8	3	..	...	...	...	2	?	?	83	?	6·2	5	...	...	4·03	8·30	− 4·27	4·03	8·30	− 4·27	Bhagalpur.	
1	...	5	16	8	...	...	...	...	6	6	0	84	·943	4·7	5	...	...	5·55	9·42	− 3·87	5·55	9·42	− 3·87	Durbhunga.	
1	1	6	18	4	...	...	...	...	8	?	?	84	?	4·3	5	...	...	8·64	7·17	+ 1·47	8·64	7·17	+ 1·47	Mozufferpore	
...	...	13	14	3	...	...	...	...	8	?	?	81	?	6·8	9	...	...	8·78	8·71	+ 0·07	8·78	8·71	+ 0·07	Motiharee.	
...	...	...	23	1	...	1	4	1	8	?	?	78	?	2·6	6	...	...	4·56	6·05	− 1·49	4·56	6·05	− 1·49	Chupra.	
5	1	7	3	1	...	3	10	...	6	5	+20	64	·829	3·7	3	...	...	1·15	4·53	− 3·38	1·15	4·53	− 3·38	Benares.	N.-W. P. (Eastern Districts).
4	...	4	4	...	1	1	7	9	7	4	+75	53	·715	2·9	1	...	...	0·35	4·68	− 4·33	0·35	4·68	− 4·33	Allahabad.	
5	1	3	14	3	1	...	2	1	3	4	−25	80	·917	3·9	7	...	...	19·50	8·22	+11·28	19·50	8·22	+11·28	Gorakhpur.	N.-W. P. (Eastern Submontane).
6	1	1	7	2	...	1	7	5	3	4	−25	55	·707	3·7	2	...	...	0·96	4·62	− 3·66	0·96	4·62	− 3·66	Lucknow.	Oudh (South).
...	...	...	7	3	1	3	9	7	7	?	?	52	·713	3·2	1	...	...	0·10	3·09	− 2·99	0·10	3·09	− 2·99	Cawnpore.	N.-W. Provinces (Central).
...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1·83	3·86	−2·03	...	...	...	**VI.—Upper Sub-Himalayas.**	
13	...	...	...	9	...	2	1	5	6	5	+20	62	·802	0·9	3	...	...	3·25	5·28	− 2·03	3·25	5·28	− 2·03	Bareilly.	N.-W. Provinces (Submontane).
21	3	2	...	1	...	1	2	...	2	2	0	58	·584	2·3	4	...	...	3·69	9·10	− 5·41	3·69	9·10	− 5·41	Dehra Dun.	
12	...	...	1	8	4	...	3	2	4	4	0	54	·642	1·1	5	...	...	6·54	4·48	+ 2·06	6·54	4·48	+2·06	Roorkee.	
5	...	1	4	6	2	...	10	2	3	3	0	52	·664	0·8	2	...	...	0·25	2·59	− 2·34	0·25	2·59	−2·34	Meerut.	
6	...	...	6	3	...	2	12	1	5	5	0	48	·650	2·7	2	...	...	0·78	3·83	− 3·05	0·78	3·83	−3·05	Delhi.	Punjab (Central).
4	...	3	7	5	2	1	6	2	3	3	0	35	·495	0·6	2	...	...	0·36	1·84	− 1·48	0·36	1·84	−1·48	Lahore.	

Table

Abstract of Observations taken at 8 A.M. at 159 stations

Meteorological Province or District.	Station.	Height of Station in feet.	Pressure 8 A.M. in inches. 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.	Temperature of Air. 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.
Punjab (Submontane).	Ludhiana	811·86	28·716	−·011	29·481	28·826	7th	28·597	12th	·229	90·3	107·9	+1·7	78·8	−1·2	93·4	+0·3	29·1	115·3	26th & 27th.	70·5	8th	44·8
Punjab (North)	Sialkot	829·47	28·701	+·005	29·482	28·820	7th	28·563	28th	·257	91·5	107·7	+1·5	79·6	−0·5	93·7	+0·5	28·1	115·9	28th	73·3	25th	42·6
	Rawalpindi	1,648·9	27·921	+·008	29·477	28·053	18th	27·763	29th	·290	86·9	103·1	−0·1	73·3	−1·4	88·2	−0·8	29·8	112·0	28th	66·2	1st	45·8
VII.—Indus Valley and N.-W. Rajputana.		...	...	+·031	...	...	...	..	..	...	...	107·6	+2·6	80·7	−0·9	94·2	+0·9	27·0	...	...	...	...	43·8
Punjab (West)	Peshawar	1110·4	28·485	+·055	29·507	28·714	18th	28·315	29th	·399	89·2	104·6	−1·0	75·8	−0·6	90·4	−0·8	28·8	114·0	3rd	68·9	14th & 18th.	45·1
	Khushab	611·51	28·907	?	29·476	29·041	18th	28·732	29th	·309	91·5	111·5	?	79·3	?	95·4	?	32·2	118·1	5th	68·0	26th	50·1
	Montgomery	558·46	28·952	?	29·462	29·104	18th	28·805	29th	·299	94·2	112·1	?	82·1	?	97·1	?	30·0	119·4	3rd	73·2	21st	46·2
	D. I. Khan	572·56	28·944	+·007	29·476	29·118	18th	28·716	29th	·402	90·9	111·4	+3·8	79·4	−1·1	95·4	+1·1	32·0	119·5	3rd, 4th & 28th.	64·8	12th	54·7
	Mooltan	420·19	29·091	+·005	29·468	29·251	18th	28·942	29th	·309	90·0	111·6	+5·5	82·6	+0·8	97·1	+3·2	29·0	119·3	4th	59·2	12th	60·1
	Sirsa	661·61	28·883	+·006	29·194	28·998	18th	28·767	12th & 29th.	·231	91·7	110·6	+4·2	82·8	−0·1	96·7	+2·1	27·8	118·4	3rd	74·3	1st	44·1
Sind and Cutch	Jacobabad	185·9	29·349	+·035	29·492	29·484	19th	29·199	29th	·285	90·7	115·6	+4·0	80·7	−2·6	98·2	+0·7	34·9	122·0	3rd & 4th	72·2	21st	49·8
	Hyderabad	117·43	29·474	+·054	29·544	29·581	19th	29·297	29th	·284	86·1	106·0	+2·8	80·2	−1·3	93·1	+0·8	25·8	112·2	1st	77·0	22nd	35·2
	Kurrachee	49	29·604	+·057	29·604	29·702	2nd	29·409	29th	·293	84·6	92·1	−1·4	80·6	−1·4	86·4	−1·4	11·5	95·1	22nd	77·8	23rd	17·3
	Bhuj	394·9	29·290	?	29·631	29·377	1st	29·122	29th	·255	86·3	99·1	?	79·5	?	89·3	?	19·6	104·6	1st	75·4	19th	29·2
Rajputana (West)	Bickaneer	743·5	29·094	?	29·789	29·154	12th	29·025	14th	·129	93·9	109·3	?	84·4	?	96·9	?	24·9	116·3	4th	73·7	20th	42·6
	Pachpadra	380	29·265*	?	29·612*	29·377	5th	29·165	15th	·212	88·0	107·8	?	80·6*	?	94·1*	?	27·2	115·3	4th	64·7	4th	50·6
VIII.—South Eastern Rajputana, Central India and Guzerat.		...	...	+·036	...	...	...	...	...	...	...	103·2	+4·2	81·9	+1·8	92·6	+3·0	21·4	...	...	..	...	34·3
Rajputana (East)	Jeypore	1430·6	28·200	+·019	29·563	28·290	18th	28·100	11th	·190	89·8	107·7	+4·6	82·1	+2·1	94·9	+3·4	25·6	114·3	3rd	75·4	7th	38·9
	Sambhar	1253·52	28·354	+·014	29·546	28·439	18th	28·250	29th	·189	89·3	105·8	+1·0	84·3	+2·7	95·1	+3·4	21·5	113·0	3rd	72·9	7th	40·1
	Ajmere	1611	28·049	+·031	29·590	28·136	18th	27·934	29th	·201	87·9	105·0	+4·5	83·4	+3·9	94·2	+4·2	21·6	111·0	3rd	72·1	14th	38·9
	Deesa	465·5	29·235	+·063	29·652	29·326	15th	29·070	29th	·244	87·3	106·2	+4·5	81·2	+0·7	93·7	+2·6	25·0	112·0	2nd	77·7	21st	34·3
Kathiawar	Rajkot	428·83	29·302	+·071	29·680	29·397	1st	29·146	29th	·251	85·2	102·7	+2·3	77·8	+0·6	90·3	+1·5	24·9	107·9	2nd	73·7	10th	34·2
	Veraval	?	29·743	?	29·705	29·838	1st	29·574	29th	·264	83·0	86·9	?	80·3	?	83·6	?	6·6	89·8	18th & 30th.	77·3	19th	12·5
	Bhavnagar	?	29·731	?	29·717	29·836	15th	29·586	29th	·250	87·2	102·1	?	81·5	?	91·8	?	20·6	107·4	2nd & 4th.	75·0	16th	32·4
Central India	Nowgong	757·04	28·841	+·016	29·538	28·916	15th	28·764	29th	·152	92·1	107·4	+4·1	83·7	+0·7	95·6	+2·4	23·7	114·1	2nd	73·5	4th	40·6
	Sutna	1,040·1	28·544	+·008	29·523	28·610	15th	28·470	28th	·140	91·3	105·7	+6·3	81·7	+0·5	93·7	+3·4	24·0	112·2	26th	74·6	5th	37·6
	Indore	1,823·2	27·897	+·050	29·648	27·990	15th	27·781	29th	·109	83·7	99·0	+4·4	77·4	+2·7	88·2	+3·6	21·6	104·4	20th	70·5	29th	33·9
	Neemuch	1,630	28·059	+·048	29·626	28·162	15th	27·922	29th	·240	85·7	102·7	+3·8	79·6	+2·4	91·2	+3·1	23·1	109·1	3rd	73·1	10th	36·0
Guzerat	Surat	36	29·748	+·079	29·728	29·834	15th	29·596	29th	·238	86·7	95·8	−1·8	81·1	+1·7	88·5	+1·8	14·7	98·7	20th	77·6	25th	21·1
N.-W. P. (West)	Agra	555·44	29·032	+·015	29·537	29·127	2nd	28·919	12th	·208	91·6	108·8	+3·8	84·0	−0·8	96·4	+1·5	24·8	115·0	26th	73·0	8th	42·0
	Jhansi	840·13	28·749	+·015	29·523	28·833	18th	28·654	12th	·179	93·7	109·1	+5·7	87·9	+4·1	98·5	+4·9	21·2	115·5	2nd	78·4	29th	37·1
IX.—Deccan	...	...	...	+·034	...	...	...	...	...	...	...	102·5	+7·8	78·4	+3·3	90·5	+5·6	24·0	...	...	...	...	37·1
Bombay (Deccan)	Belgaum	2,524	27·319	+·046	29·768	27·386	7th	27·232	29th	·154	75·0	87·5	+6·4	69·1	+1·3	78·3	+3·9	18·4	93·3	1st & 3rd	66·8	4 days.	26·5
	Sholapur	1,589·7	28·213	+·054	29·738	28·265	1st	28·124	29th	·141	81·8	101·6	+6·9	74·8	+2·2	88·2	+4·6	26·8	107·7	1st, 2nd & 3rd.	70·0	24th	37·7
	Poona	1,840·37	27·970	+·065	29·747	28·036	15th	27·840	30th	·196	80·8	96·4	+7·7	74·0	+1·4	85·2	+4·6	22·4	102·8	19th	70·9	16th	31·9
Khandeish	Malegaon	1,430·12	28·329	+·055	29·700	28·386	1st	28·233	29th	·153	84·3	101·1	+6·2	76·6	+1·9	88·9	+4·1	24·5	107·3	1st & 4th	71·2	25th	36·1
	Ahmednagar	2,151·62	27·648	?	29·728	27·720	15th	27·541	30th	·179	79·8	97·8	?	72·8	?	85·3	?	25·0	103·2	2nd	69·9	16th & 24th.	33·3
Berar	Akola	930	28·789	+·049	29·659	28·861	15th	28·695	29th	·168	86·5	105·6	+7·6	80·7	+3·4	93·2	+5·5	24·9	111·6	20th	72·7	28th	38·9
	Amraoti	1,215·5	28·479	+·036	29·632	28·552	15th	28·400	29th	·152	86·3	106·7	+9·5	80·6	+4·6	93·6	+7·1	26·1	112·3	3rd	70·8	27th	41·5

* Mean of 29 days.

† Twenty-eight days, wind direction observations.

I—*continued.*

in India, Burma, &c., in June 1891—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 30th June.	Normal rainfall for period 1st to 30th June.	Variation from normal of period.	Station.	Meteorological Province or District.
9	...	1	1	6	4	...	8	1	3	2	+ 50	45	·632	0·9	2	...	...	0·97	2·47	−1·50	0·97	2·47	−1·50	Ludhiana .	Punjab (Submontane).
2	8	2	11	4	1	...	2	...	4	2	+100	38¶	·556¶	1·0	1	...	...	0·35	3·51	−3·16	0·35	3·51	−3·16	Sialkot .	Punjab (North).
10	2	2	1	4	1	3	...	7	3	3	0	39	·498	2·1	2	...	...	0·30	1·66	−1·36	0·30	1·66	−1·36	Rawalpindi.	
...	...	...	...	...	...	...	...	...	...		...	...	...	...	...	...	...	0·11	0·87	0·77	...	...	...	**VII.—Indus Valley and N.-W. Rajputana.**	
7	1	3	3	5	2	2	3	4	6	5	+ 20	33	·456	1·9	...	...	...	0·14	0·47	−0·33	0·14	0·47	−0·33	Peshawar .	Punjab (West).
4	6	8	6	2	1	1	...	2	6	?	?	29	·430	1·0	1	...	...	0·11	0·70	−0·59	0·11	0·70	−0·59	Khushab .	
1	4	2	2	7	2	7	4	1	9	?	?	38	·618	1·0	...	...	...	0	1·29	−1·29	0	1·29	−1·29	Montgomery.	
12	3	3	5	..	...	1	2	4	1	2	− 50	49	·721	0·1	1	...	...	0·50	0·52	− 0·02	0·50	0·52	−0·02	D. I. Khan.	
12	..	2	...	10	...	6	...	...	1	4	− 75	38	·531	0	...	...	...	0	0·68	−0·68	0	0·68	−0·68	Mooltan.	
...	...	2	3	3	6	7	9	...	9	5	+ 80	46	·685	2·5	3	...	...	0·45	1·90	−1·45	0·45	1·90	−1·45	Sirsa.	
8	1	...	8	7	1	...	1	4	3	5	− 40	45	·646	0·1	...	...	...	0·05	0	+0·05	0·05	0	+0·05	Jacobabad .	Sind and Cutch.
...	...	...	...	...	...	29	...	1	13	15	13	61	·744	1·7	...	...	...	0	0·14	−0·14	0	0·14	−0·14	Hyderabad.	
...	...	...	...	...	...	11	17	2	19	19	0	79	·948	4·1	...	...	...	0·01	0·12	−0·11	0·01	0·12	−0·11	Kurrachee.	
...	...	...	...	...	1	12	17	...	11	16	− 31	68	·857	3·1	...	...	...	0	2·17	−2·17	0	2·17	−2·17	Bhuj.	
...	...	...	...	1	4	24	1	...	10	8	+ 25	42	·658	0·8‖	...	...	...	0·02	1·78	−1·76	0·02	1·78	−1·76	Bickaneer .	Rajputana (West).
...	...	...	...	...	6	19	5	...	15	12	+ 25	65§	·865§	1·6	...	...	...	0	0·69	−0·69	0	0·69	−0·69	Pachpadra.	
...	...		...	...	...	...	...	...	..	...	...	...	...	...	.	..	...	0·81	4·14	−3·27	...	...	...	**VIII.—South-Eastern Rajputana, Central India and Guzerat.**	
1	...	...	2	...	...	4	15	7	8	8	0	44	·615	1·2	2	...	...	0·38	2·31	−1·93	0·38	2·31	−1·93	Jeypore .	Rajputana (East).
...	...	...	...	...	...	4	23	3	17	11	+55	48	·661	0·3	2	...	...	0·70	1·31	−0·61	0·70	1·31	−0·61	Sambhar.	
...	...	...	...	...	...	4	25	1	14	9	+56	56	·727	0·6	1	...	...	0·10	2·43	−2·33	0·10	2·43	−2·33	Ajmere.	
...	9	2	...	...	...	...	...	19	19‡	17	+12	58	·748	5·0	...	...	..	0	1·73	−1·73	0	1·73	−1·73	Deesa.	
...	...	...	...	...	2	2	23	3	9	14	−36	74	·890	3·7	3	...	...	1·45	4·83	−3·38	1·45	4·83	−3·38	Rajkot .	Kathiawar.
3	...	...	...	2	2	7	15	1	10	?	?	85	·957	5·5	...	...	...	0·03	?	?	0·03	?	?	Veraval.	
...	...	...	...	...	6	19	2	1	23	?	?	74	·956	6·0	2	...	...	0·80	?	?	0·80	?	?	Bhavnagar.†	
1	...	...	6	...	...	2	17	4	4	4	0	45	·653	2·6	4	...	...	1·14	5·05	−3·91	1·14	5·05	−3·91	Nowgong. .	Central India.
1	5	1	3	1	1	...	15	3	10	10	0	38	·517	1·7	3	...	...	1·33	5·73	−4·40	1·33	5·73	−4·40	Sutna.	
...	..	..	...	...	...	6	21	3	9	7	+29	62	·715	2·5	4	...	...	2·61	6·96	−4·35	2·61	6·96	−4·35	Indore.	
...	...	...	...	...	...	20	9	1	17	14	+21	65	·797	0·5	...	...	...	0	4·09	−4·09	0	4·09	−4·09	Neemuch.	
...	...	...	...	1	3	20	6	...	?	16	?	74	·951	6·7	2	...	...	0·50	8·31	−7·81	0·50	8·31	−7·81	Surat . .	Guzerat.
...	..	...	1	8	...	7	1	13	7	6	+17	42	·598	1·6	4	...	...	2·04	2·84	−0·80	2·04	2·84	−0·80	Agra . .	N.-W. P. (West).
...	4	..	1	4	3	6	1	11	6	6	0	36	·556	1·3	1	.	...	0·27	4·12	−3·85	0·27	4·12	−3·85	Jhansi.	
...	...	..	..	...	...	...	...	...	..	...	..	..		...	..	...	...	1·72	7·27	−5·55	...	...	...	**IX.—Deccan.**	
2	...	...	...	...	...	3	14	11	5	24	−79	76	·658	6·9	1	...	...	0·39	7·47	−7·08	0·39	7·47	−7·08	Belgaum .	Bombay (Deccan).
...	...	...	...	...	...	9	15	6	10	12	−17	59	·635	4·1	5	...	...	2·35	5·25	−2·90	2·35	5·25	−2·90	Sholapur.	
...	...	...	...	...	...	6	17	7	17	16	+ 6	63	·661	5·3	2	...	...	0·66	4·35	−3·69	0·66	4·35	−3·69	Poona.	
...	...	...	...	...	...	9	14	7	14	12	+17	61	·703	3·8	4	...	...	1·90	4·99	−3·09	1·90	4·99	−3·09	Malegaon .	Khandeish.
...	2	...	...	...	...	4	11	13	12‡	?	?	73	·739	4·1	5	...	...	1·89	4·95	−3·06	1·89	4·95	−3·06	Ahmednagar.	
...	...	...	...	...	...	...	1	29	16	9	+78	55	·679	4·1	3	...	...	0·73	5·86	−5·13	0·73	5·86	−5·13	Akola . .	Berar.
...	...	...	...	...	...	...	14	16	13	7	+86	52	·641	4·2	2	...	...	2·58	7·67	−5·09	2·58	7·67	−5·09	Amrao .	

¶ Mean of 21 days. ‖ Mean of 18 days. ‡ Mean of 28 days. § Mean of 28 days.

Table

Abstract of Observations taken at 8 A.M. at 159 stations

Meteorological Province or District.	Station.	Height of Station 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.
Central Provinces (West).	Khandwa	1,043·71	28·676	+·058	29·671	28·753	15th	28·571	29th	·182	84·6	103·3	+5·5	80·6	+2·6	92·0	+4·1	22·7	109·7	20th	67·1	26th	42·6
	Hoshangabad	1,020	28·670	+·037	29·633	28·757	15th	28·602	29th	·155	89·0	106·1	+7·6	83·4	+4·5	94·8	+6·1	22·7	112·6	3rd	74·7	28th	37·9
	Nagpur	1,025	28·622	+·008	29·578	28·699	15th	28·568	29th	·131	92·6	109·5	+11·4	84·3	+6·5	96·9	+9·0	25·2	113·9	2nd, 4th, 21st & 25th.	78·0	6th & 28th	35·9
Central Provinces (Central).	Seoni	2,030	27·641	+·012	29·596	27·719	15th	27·578	29th	·141	89·1	103·1	+9·2	78·0	+2·7	90·6	+6·0	25·1	108·2	1st, 4th, 25th & 26th.	71·1	6th	37·1
	Jubbulpore	1,327·02	28·311	+·026	29·573	28·378	15th	28·248	12th	·130	87·8	103·6	+6·3	80·3	+2·0	92·0	+4·2	23·3	112·0	1st	73·1	6th	38·9
	Saugor	1,751·5	27·900	+·027	29·577	27·983	15th	27·825	29th	·158	88·2	105·1	+5·9	80·6	+3·7	92·8	+4·8	24·5	111·9	4th	72·6	7th	39·3
Central Provinces (East).	Raipur	960	28·646	0	29·541	28·709	15th	28·587	12th	·122	92·5	107·3	+10·2	83·1	+5·1	95·2	+7·7	24·2	113·7	25th	71·1	6th	42·6
Hyderabad (South).	Secunderabad	1,786·69	27·975	+·009	29·690	28·018	7th	27·913	29th	·105	82·6	102·4	+8·8	77·8	+3·9	90·2	+6·4	24·6	108·8	1st	71·9	26th	36·9
X.—West Coast		...	...	**+·036**	...	...	...	...	...	...	...	**86·7**	**+2·2**	**76·0**	**+1·4**	**81·4**	**+1·8**	**10·7**	...	...	...	...	**18·9**
Konkan	Bombay	37	29·779	+·065	29·757	29·855	1st & 2nd.	29·621	30th	·234	84·8	90·2	+2·6	81·6	+2·3	85·9	+2·5	8·6	92·4	8th	76·0	29th	16·4
	Ratnagiri	110	29·715	+·055	29·764	29·788		29·614	30th	·174	85·1	90·9	+4·5	79·2	+2·4	85·0	+3·5	11·7	93·4	6th & 7th	73·4	28th & 29th.	20·0
	Mormugao	?	29·785	?	29·780	29·849	1st	29·709	29th	·140	83·4	89·2	?	80·7	?	85·0	?	8·5	92·0	4 days	74·0	27th	18·0
	Karwar	43·87	29·806	+·026	29.786	29·869	1st	29·741	17th	·128	80·4	87·7	+2·7	76·9	+1·5	82·4	+2·1	10·8	91·3	4 days	71·8	28th	19·5
Malabar	Mangalore	25·60	29·867	+·034	29·827	29·939	7th	29·792	17th	·147	77·8	85·6	+1·0	75·1	+0·2	80·4	+0·6	10·5	91·3	1st & 2nd	71·9	25th	19·4
	Calicut	26·58	29·870	+·014	29·829	29·935	7th	29·780	17th	·155	78·2	84·3	?	74·8	?	79·6	?	9·5	92·3	2nd	72·6	18th	19·7
	Cochin	11·03	29·904	+·020	29·844	29·965	7th	29·817	17th	·148	77·9	84·4	0	75·1	+0·7	79·8	+0·4	9·3	89·2	1st & 2nd	73·2	3rd, 24th & 25th.	16·0
	Trivandru	?	29·577	?	29·855	29·643	7th	29·494	17th	·149	77·6	81·4	?	64·9	?	73·2	?	16·5	84·5	17th	62·5	22nd to 24th.	22·0
XI.—South India		...	...	**+·005**	...	...	...	...	...	...	...	**97·0**	**+2·3**	**78·6**	**+1·1**	**87·8**	**+1·7**	**18·4**	...	...	...	...	**30·4**
Madras (South)	Pamban	37	29·808	?	29·772	29·867	7th	29·733	21st	·134	83·0	88·0	?	*80·0	?	*84·0	?	8·0	93·8	22nd	78·2	4 days	15·6
	Madura	446·60	29·374	+·007	29·755	29·433	7th	29·307	17th	·126	84·6	97·8	−1·2	76·9	+0·3	87·3	−0·5	20·9	103·0	1st	59·2	4th	43·8
Madras (South Central).	Salem	939·91	28·913	+·008	29·797	28·976	7th	28·854	17th	·122	79·7	95·2	+0·9	74·7	+1·4	85·0	+1·2	20·5	101·4	1st	70·0	5th	31·4
	Coimbatore	1,347·64	28·488	+·006	29·789	28·532	7th & 10th.	28·421	17th	·111	76·4	88·7	−1·3	71·2	−0·4	80·0	−0·9	17·5	96·8	1st	68·1	18th	28·7
Coorg	Mercara	3,780 7	26·193	?	29·831	26·279	7th	26·129	17th	·150	66·3	75·5	+3·2	63·9	+0·5	69·7	+1·9	11·6	82·2	3rd	61·2	30th	21·0
Mysore	Bangalore	2,981·46	26·921	+·021	29·818	26·972	7th	26·867	29th	·105	72·3	86·5	+1·8	67·4	+1·0	77·0	+1·4	19·1	93·7	1st	65·0	16th	28·7
Madras (East Coast, South).	Negapatam	15	29·777	−·004	29·722	29·837	7th	29·712	21st	·125	86·0	98·3	+1·6	79·4	+0·5	88·9	+1·1	18·9	103·2	21st, 22nd & 23rd.	75·7	18th	27·5
	Cuddalore	12·44	29·780	?	29·723	29·839	7th	29·723	17th	·116	86·0	100·6	?	80·4	?	90·5	?	20·2	105·8	14th	77·2	1st & 29th.	28·6
	Trichinopoly	254·78	29·562	+·005	29·750	29·612	7th	29·492	21st	·120	85·0	101·7	+3·3	79·3	+1·3	90·5	+2·3	22·4	106·2	15th	75·4	29th	30·8
	Madras	22	29·743	−·001	29·697	29·786	7th	29·685	21st	·101	88·6	102·5	+4·4	81·9	+1·6	92·2	+3·0	20·6	107·5	7th	72·5	28th & 29th.	35·0
Madras (East Coast, Central).	Nellore	70·82	29·661	?	29·668	29·724	7th	29·612	17th & 22nd	·112	90·5	106·6	?	85·2	?	95·9	?	21·4	111·3	2nd	80·1	24th & 29th.	31·2
	Masulipatam	7·5	29·682	−·011	29·633	29·728	19th	29·634	12th	·094	88·5	105·9	+8·2	82·3	+2·1	94·2	+5·2	23·6	112·7	1st	72·1	3rd	40·6
Madras (Central)	Cuddapah	433·36	29·364	?	29·733	29·422	7th	29·296	17th	·126	87·4	103·2	?	82·2	?	92·7	?	21·0	107·3	1st, 16th	73·2	1st	34·1
	Kurnool	923·45	28·870	?	29·731	28·933	7th	28·808	17th	·125	84·7	100·7	?	79·2	?	90·0	?	21·5	106·0	17th & 20th	69·9	28th	36·1
	Bellary	1,474·63	28·336	+·040	29·752	28·408	7th	28·267	29th	·141	82·0	98·4	+3·5	76·7	+1·0	87·6	+2·3	21·7	103·0	18th	71·0	20th	32·0
Madras (East-Coast, North).	Rajahmundry	112	29·565	?	29·613	29·631	19th	29·516	12th	·115	90·7	107·4	?	83·6	?	95·5	?	23·8	114·1	15th	74·6	3rd	39·5
	Coconada	26	29·645	?	29·608	29·709	3rd & 19th.	29·589	22nd	·120	87·9	104·3	?	81·8	?	93·1	?	22·5	110·4	22nd & 24th.	71·6	3rd	38·8
	Vizagapatam	31	29·622	+·001	29·592	29·708	2nd	29·556	21st	·152	87·8	92·3	+2·2	84·7	+2·3	88·5	+2·3	7·6	99·9	25th	78·9	5th	21·0
	Gopalpur	21·45	29·586	−·018	29·549	29·666	4th	29·515	28th	·151	85·2	88·9	+1·0	83·0	+1·3	85·9	+1·2	5·9	91·7	6th	78·3	5th	13·4
XII.—Hill Stations		...	...	...	...	...	...		...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Beluchistan	Quetta	5,502·26	24·542	+·078	?	24·650	1st	24·411	29th	·239	72·3	86·3	−4·3	53·3	−5·9	69·8	−5·1	33·0	99·1	2nd	46·9	23rd	52·2
	Khelat	?	?	?	?	?	?	?	?	?	?	87 5	?	45·8	?	66·7	?	41·7	98·0	4th	40·0	16th & 23rd.	58·0
Northern India	Murree	6,343·86	23·757	+·035	?	23·854	6th	23·670	12th	·184	71·7	81·3	−0·9	63·6	−1·2	72·5	−1·1	17·7	93·7	28th	51·8	15th	41·9
	Simla†	7274	22·969	+·018	?	23·071	1st	22·881	13th	·190	66·5	77·7	−0·5	61·4	+0·9	69·6	+0·2	16·3	84·2	27th	54·9	7th	29·3

* Mean of 29 days.
† Twenty-six days' wind direction observations.

I—*continued.*

in India, Burma, &c., in June 1891—continued.

Wind Direction. Number of winds from									Wind Velocity.			Hygrometry, 8 A.M.			Rainfall.									Station.	Meteorological Province or District.
Calm.	N.	NE.	E.	SE.	S.	SW.	W.	NW.	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.	Normal rainfall for period 1st to 30th June.	Variation from normal of period.		
...	...	...	...	...	...	1	24	5	15	10	+ 50	61	·713	3·5	5	...	...	·532	6·30	—0·98	5·32	6·30	—0·98	Khandwa .	Central Provinces (West).
...	1	...	...	...	1	16	12	...	9	5	+ 80	62	·811	3·3	2	...	...	·066	8·43	- 7·77	0·66	8·43	—7·77	Hoshangabad	
...	...	1	...	...	3	2	12	12	13	8	+ 65	44	·651	2·9	...	...	...	0·01	9·74	—9·73	0·01	9·74	—9·73	Nagpur.	
...	3	...	...	...	3	4	11	9	5	6	17	45	·595	2·6	7	...	...	2·20	11·50	—9·30	2·20	11·50	—9·30	Seoni . .	Central Provinces (Central).
4	1	...	...	2	1	...	18	4	4	5	— 20	49	·628	1·9	7	...	...	2·63	9·98	—7·35	2·63	9·98	—7·35	Jubbulpore.	
...	2	...	...	2	...	8	13	5	8	5	+ 60	45	·578	2·5	2	...	...	1·51	6·32	—4·81	1·51	6·32	—4·81	Saugor.	
...	...	...	...	...	2	10	14	4	11	9	+ 22	40	·570	4·3	3	...	...	2·04	11·54	—9·50	2·04	11·54	—9·50	Raipur .	Central Provinces (East).
...	...	...	...	...	...	4	14	12	12	12	0	62	·685	5·0	2	...	...	0·88	4·68	- 3·80	0·88	4·68	—3·80	Secunderabad	Hyderabad (South).
...	...	...	...	...	...	...	...		...	...	...	...	...	...	...	...	...	20·40	31·54	—10·08	...	...	...	**X.—West Coast.**	
...	...	1	...	4	3	2	16	4	12	16	— 25	77	·920	5·3	8	...	...	13·75	19·91	—6·16	13·75	19·91	—6·16	Bombay .	Konkan.
...	5	1	...	6	1	3	7	7	9	12	— 25	73	·873	4·6	13	...	...	9·51	30·96	—21·45	9·51	30·96	—21·45	Ratnagiri.	
1	...	...	1	2	4	2	8	12	7	?	?	78	·909	5·7	11	...	...	15·86	?	?	15·86	?	?	Mormugao.	
6	6	...	...	...	...	8	2	8	3	?	?	83	·861	6·0	21	...	...	16·92	38·59	—21·67	16·92	38·59	—21·67	Karwar.	
13	2	3	3	5	...	1	...	3	2	4	— 50	92	·877	8·9	24	...	...	35·15	36·29	—1·14	35·15	36·29	—1·14	Mangalore .	Malabar.
14	5	1	1	1	1	2	...	5	9	?	?	88	·847	8·3	26	...	...	29·51	33·97	— 4·46	29·51	33·97	—4·46	Calicut.	
6	1	10	3	1	...	2	2	5	5	?	?	88	·860	8·4	27	...	...	23·92	29·50	—5·58	23·92	29·50	-5·58	Cochin.	
...	13	3	2	..	...	...	4	8	8	?	?	88	·836	9·2	21	...	...	18·57	?	?	18·57	?	?	Trivandrum.	
...	...	..	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...	2·19	4·47	—2·16	...	...	...	**XI.- South India.**	
...	...	...	...	...	8	19	3	...	13	?	?	74	·836	4·0	0	...	...	0	?	?	0	?	?	Pamban. .	Madras (South).
3	3	...	...	...	2	3	11	8	3	5	— 40	64	·770	3·5	3	...	..	2·12	1·19	+0·93	2·12	1·19	+0·93	Madura.	
8	...	...	...	1	10	13	...	...	3	5	— 40	74	·767	4·1	7	...	...	4·46	3·60	+0·86	4·46	3·60	+0·86	Salem .	Madras (South Central).
...	...	1	...	2	18	8	1	...	7	8	— 13	84	·771	5·1	1	...	...	0·39	1·56	—1·17	0·39	1·56	— 1·17	Coimbatore.	
...	2	...	...	...	...	...	23	5	6	9	— 33	92	·601	8·9	23	...	...	12·20	28·67	—16·47	12·20	28·67	—16·47	Mercara .	Coorg.
...	...	...	...	...	...	10	19	1	5	8	— 38	79	·632	7·4	10	...	...	8·62	2·73	+5·89	8·62	2·73	+5·89	Bangalore .	Mysore.
...	...	...	...	...	1	18	10	1	4	8	— 50	62	·774	4·4	...	...	...	0·12	1·87	—1·75	0·12	1·87	—1·75	Negapatam.	Madras (East Coast, South).
...	...	...	...	...	8	8	9	5	2	?	?	73	·895	1·4	2	...	...	0·44	1·38	—0·94	0·44	1·38	—0·94	Cuddalore.	
...	...	...	...	...	...	7	18	5	11	10	+ 10	66	·793	4·3	1	...	...	0·46	1·51	—1·05	0·46	1·51	—1·05	Trichinopoly.	
...	1	...	...	...	4	8	15	2	11	9	+ 22	61	·824	5·9	1	...	...	0·20	2·45	—2·25	0·20	2·45	—2·25	Madras.	
1	...	...	...	1	...	...	5	23	12	?	?	57	·813	6·6	...	...	...	0·04	1·45	—1·41	0·04	1·45	—1·41	Nellore .	Madras (East Coast, Central).
3	1	...	...	1	2	...	10	13	10	9	+ 11	76	1·022	5·9	4	...	...	2·90	5·22	- 2·32	2·90	5·22	—2·32	Masulipatam	
..	...	...	...	...	...	5	16	9	?	?	?	55	·713	6·2	2	...	...	1·30	3·62	—2·32	1·30	3·62	—2·32	Cuddapah .	Madras (Central)
13	...	...	...	...	...	11	6	...	?	?	?	60	·707	4·9	4	...	...	1·07	3·85	—2·78	1·07	3·85	—2·78	Kurnool.	
4	...	...	1	...	...	1	14	10	11	11	0	65	·710	5·0	3	...	...	1·96	1·59	+0·37	1·96	1·59	+0·37	Bellary.	
9	...	...	...	...	3	2	16	...	?	?	?	62	·877	5·5	4	...	...	0·78	4·68	—3·90	0·78	4·68	— 3·90	Rajahmundry	Madras (East Coast, North).
...	...	..	...	1	...	8	19	2	9		?	62	·818	3·8	3	...	...	0·96	4·35	- 3·39	0·96	4·35	—3·39	Coconada.	
...	...	...	...	1	1	8	18	2	4	4	0	69	·905	6·1	5	...	...	3·17	3·78	—0·61	3·17	3·78	—0·61	Vizagapatam	
1	1	...	...	...	3	21	1	3	18	12	+50	84	1·011	4·0	2	...	...	0·48	7·00	—6·52	0·48	7·00	—6·52	Gopalpur.	
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	**XII.- Hill Stations.**	
29	1	...	...	...	...	...	...	...	2	4	— 50	38	·314	0·2	...	...	...	0	0·10	- 0·10	0	0·10	—0·10	Quetta. .	Beluchistan.
...	...	...	...	...	...	1	1	28	?	?	?	?	?	?	...	...	...	0	?	?	0	?	?	Khelat.	
8	2	1	2	8	4	...	1	4	8	7	+14	38	·291	2·4	8	...	...	2·46	2·51	— 0·05	2·46	2·51	—0·05	Murree	Northern India.
10	...	3	4	4	2	1	2	...	?	?	?	49	·306	2·8	4	...	...	0·96	7·10	— 6·14	0·96	7·10	—6·1	Simla.	

Table

Abstract of Observations taken at 8 A.M. at 159 stations

Meteorological Province or District.	Station.	Height of Station 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.
Northern India —*contd.*	Mussooree	?	23·472	?	?	23·573	1st & 2nd	23·406	12th	·167	68·8	83·5	+7·9	59·7	−0·9	71·6	+3·5	23·8	93·3	20th	52·0	7th	41·3
	Ranikhet	6,068·75	23·947	−·007	?	24·059	2nd.	23·868	12th	·191	72·0	80·5	+2·3	65·1	+1·7	72·8	+2·0	15·4	87·1	21st	58·0	3rd & 30th.	29·1
	Darjeeling	7,421·1	22·855	−·030	?	22·968	2nd	22·743	12th	·225	60·0	65·0	+0·3	55·5	+0·3	60·3	+0·3	9·5	68·1	19th & 20th	51·6	4th	16·5
	Kalimpong	?	?	?	?	?	...	?	...	?	69·2	75·9	?	66·7	?	71·3	?	9·2	78·6	12th	62·4	5th	16·2
Central India	Mount Abu	3,945	25·924	+·050	?	26·000	19th	25·789	29th	·211	73·7	86·4	+2·7	68·4	+0·5	77·4	+1·6	18·0	91·7	4th	63·8	14th	27·9
	Pachmarhi	3,511	26·322	+·053	?	26·395	15th	26·242	29th	·153	80·7	94·4	+8·6	76·2	+4·7	85·3	+6·7	18·2	100·2	3rd, 21st & 25th.	69·7	28th	30·5
South India	Wellington	6,200	24·225	+·038	?	24·284	7th	24·176	29th	·108	67·8	73·3	+1·6	57·5	−0·9	65·4	+0·4	15·8	79·7	1st	52·6	18th	27·1
XIII.—Extra India		...	...	...	...	...	...	...	...	...		...	...	...	...	...	...	...	...	...	...	...	...
Persia	Meshed	?	?	?	?	?	?	?	?	?	71·4	86·3	?	63·7	?	75·0	?	22·6	94·0	1st & 2nd	56·0	13th & 19th.	38·0
	Bushire	14	29·656*	?	29·626*	29·834	2nd	29·423	30th	·411	88·2*	94·6*	?	81·5*	?	88·0*	?	13·1	104·5	16th	76·0	4th	28·5
	Baghdad	?	29·334	?	?	29·474	2nd	29·172	14th	·302	88·7	104·2	?	76·4	?	90·3	?	27·8	111·8	28th	66·4	1st	45·4
Arabia	Aden	94·1	29·700	?	29·724	29·766	8th	29·578	29th	·188	88·1	93·6	?	83·3	?	88·5	?	10·3	97·8	30th	76·6	20th	21·2
Africa	Zanzibar	73	30·082	?	30·082	30·134	11th	30·030	26th	·104	74·8	80·6	?	73·9	?	77·3	?	6·7	82·8	1st	72·6	14th	10·2
Arabian Sea Islands.	Minicoy	10·5	29·930	?	29·865	29·996	7th	29·846	17th	·150	80·5	83·5	?	78·6	?	81·1	?	4·9	83·3	1st, 12th & 13th.	74·2	24th	12·1

* Mean of 29 days.

I—*concluded.*

in India, Burma, &c., in June 1891—concluded.

Wind Direction. Number of winds from									Wind Velocity.			Hygrometry, 8 A.M.		Mean cloud amount.	Rainfall.									Station.	Meteorological Province or 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 30th June.	Normal rainfall for period 1st to 30th June.	Variation from normal of period.		
...	5	2	5	5	2	...	1	10	?	10	?	61	·421	2·4	3	...	...	3·51	7·88	−4·37	13·51	7·88	−4·37	Mussooree.	Northern India—*contd.*
16	...	...	...	...	...	4	10	...	4	3	+33	55	·415	2·8	4	...	...	4·24	5·58	−1·34	4·24	5·58	−1·34	Ranikhet.	
9	1	2	5	...	...	6	6	1	5	5	0	95	·494	9·4	17	...	...	14·49	24·54	−10·05	14·49	24·54	−10·05	Darjeeling.	
6	1	...	...	8	3	2	4	6	?	?	?	95	·682	7·9	13	...	...	6·31	?	?	6·31	?	?	Kalimpong .	
...	...	...	...	...	...	14	14	2	12	10	+20	67	·529	2·3	1	...	...	1·52	4·80	−3·28	1·52	4·80	−3·28	Mount Abu .	Central India.
...	...	...	...	...	2	11	12	5	10	8	+25	51	·521	3·6	3	...	...	0·61	10·58	−9·97	0·61	10·58	−9·97	Pachmarhi.	
17	...	...	...	2	2	6	1	2	3	5	−20	66	·454	5·1	13	...	...	4·15	3·28	+0·87	4·15	3·28	+0·87	Wellington .	South India.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...		...	...	**XIII.—Extra India**	
3	4	4	...	3	...	1	3	12	1	?	?	?	?	0·8	...	...	...	0	?	?	0	?	?	Meshed .	Persia.
...	2	2	4	2	...	1	4	14	8†	11	−27	57*	·753*	0	...	...	...	0	0	0	0	0	0	Bushire.	
...	12	7	3	2	...	...	3	3	?	?	?	39*	·521*	0·6	...	...	...	0	?	?	0	?	?	Baghdad.	
15	...	6	5	...	1	3	...	...	7	8	−13	72	·948	2·3	1	...	...	0·70	0	+0·70	0·70	0	+0·70	Aden.	Arabia.
...	...	...	...	2	17	10	1	...	?	?	?	89	·769	4·0	4	...	...	4·36	?	?	4·36	?	?	Zanzibar .	Africa.
...	...	...	...	...	2	20	5	2	19	?	?	86	·894	7·0	20	...	...	16·71	?	?	16·71	?	?	Minicoy .	Arabian Sea Islands.

† Mean of 25 days.

Table

Abstract of Observations recorded at 10 A.M. and 4 P.M at 89 stations

Station.	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 to 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.
Murree	23·780	23·757	·024	23·762	+ ·048	?	81·3	65·3	18·0	93·5	49·9	43·6	75·8	77·6	71·9	− 0·8	51·3	58·4	58·8	56·2
Chamba	26·675	26·610	·065	26·655	+ ·003	?	95·5	67·9	27·6	105·3	61·6	43·7	83·1	91·7	80·2	+ 0·4	58·4	65·7	67·3	63·8
Kailang	20·760	20·703	·057	20·744	+ ·033	?	70·2	41·2	29·1	78·5	34·5	44·0	61·5	65·5	53·9	− 0·7	37·2	47·1	48·4	44·2
Simla	22·980	22·948	·031	22·957	− ·008	?	77·7	61·4	16·3	84·1	54·9	29·2	71·0	75·0	69·4	+ 1·2	50·7	56·7	58·2	55·2
Peshawar	28·483	28·394	·089	28·433	+ ·049	29·494	104·5	76·2	28·3	114·0	68·9	45·1	95·5	102·3	89·4	− 0·1	62·2	68·8	71·1	67·4
Lahore	·828	·740	·088	·778	+ ·007	·426	108·6	77·8	30·8	115·5	68·6	46·9	99·5	107·1	92·4	+ 1·5	65·3	72·8	72·9	70·3
Ludhiana	·722	·635	·086	·673	− ·009	·427	106·9	78·8	28·1	114·5	70 5	44·0	97·9	105·1	92·2	+ 0·8	68·7	76·3	77·7	74·2
Mooltan	29·099	29·003	·096	29·045	+ ·006	·415	111·4	83·7	27·7	119·3	75·2	44·1	96·7	110·7	97·0	+ 3·0	69·2	74·5	79·6	74·5
Jacobabad	·356	·242	·114	·293	+ ·033	·430	115·4	80·5	34·9	122·2	72·1	50·1	101·9	113·6	97·1	+ 0·6	67·0	76·5	75·9	73·1
Hyderabad	·489	·379	·110	·435	+ ·050	·501	105·6	80·3	25·4	111·2	77·1	34·1	96·5	102·1	91·8	+ 1·0	74·5	76·8	78·1	76·5
Kurrachee	·607	·536	·071	·573	+ ·054	·573	92·9	80·6	12·3	95·9	77·8	18·1	88·8	89·8	85·7	− 1·1	77·3	80·9	81·9	80·0
Jeypore	28·204	28·110	·094	28·157	+ ·024	·497	107·5	82·1	25·4	114·2	73·2	41·0	97·3	104·7	94·0	+ 3·3	68·0	74 6	74·0	72·2
Ajmere	·051	27·956	·095	·010	+ ·026	·528	104·7	83·5	21·2	111·0	76·1	34·9	93·5	103·0	92·9	+ 4·6	73·4	76·9	78·7	76·4
Mount Abu	25·936	25·873	·062	25·909	+ ·049	?	86·2	68·4	17·8	91·7	63·7	28·0	77·5	85·2	77·0	+ 1·9	61·5	67·3	69·1	66·0
Chakrata	23·154	23·120	·035	23·130	− ·001	?	76·1	60·8	15·3	84·0	55·3	28·7	71·0	73·2	68·2	+ 0·9	52·7	58·3	59·5	56·8
Ranikhet	·958	·914	·045	·924	− ·014	?	80·4	64·9	15·5	87·1	56·0	31·1	74·7	77·2	72·4	+ 1·4	55·1	61·3	63·5	60·0
Pithoragarh	24·614	24·552	·062	24·571	+ ·025	?	84·0	64·8	19·2	91·2	58·9	32·3	77·0	82·1	74·5	+ 1·9	58·2	65·4	66·4	63·3
Dehra	27·389	27·308	·081	27·338	− ·008	·466	95·6	73·6	22·0	103·1	67·6	35·5	87·3	93·4	84·3	− 0·3	63·7	70·2	71·0	68·3
Roorkee	28·685	28·582	·104	28·629	+ ·007	·458	102·5	76·9	25·6	110·2	68·7	41·5	92·9	100·1	89·3	− 1·2	67·2	74·9	74·2	72·1
Meerut	·838	·740	·099	·780	+ ·020	·460	104·1	78·7	25·5	110·2	71·9	38·3	95·5	101·7	91·0	− 0·2	69·8	73·6	73·6	72·3
Agra	29·037	·943	·093	·983	+ ·027	·477	108·4	84·0	24·4	115·1	72·9	42·2	99·1	105·8	95·7	+ 1·0	69·0	75·9	76·2	73·7
Lucknow	·208	29·095	·113	29·153	0	·470	103·1	81·1	22·0	111·3	70·8	40·5	94·2	101·2	92·0	+ 0·3	70·9	76·1	75·9	74·2
Allahabad	·260	·149	·111	·207	+ ·004	·460	105·0	82·4	23·6	112·7	73·6	39·1	97·0	104·0	93·1	+ 2·2	71·9	77·1	77·7	75·6
Ghazipur	·351	·248	·103	·304	+ ·010	·472	99·8	82·2	17·6	109·2	74 3	34·9	92·5	96·8	89·6	+ 1·9	74·9	78·1	78·0	77·0
Nowgong	28·838	28·732	·106	28·789	+ ·014	·474	107·0	83·7	23·3	114·0	73·5	40·5	98·2	104·9	94·5	+ 3·0	69·8	76·7	77·0	74·6
Sutna	·546	·439	·107	·496	+ ·004	·462	105·3	81·7	23 6	112·0	74·6	27·4	98·4	103·3	92·6	+ 3·0	68·1	73·1	72·3	71·2
Durbhunga	29·442	29·338	·104	29·396	+ ·013	·513	92·6	79·0	13·6	99·9	73·5	26·4	86·6	90·6	84·5	− 0·1	77·0	80·8	81·2	79·6
Patna	·388	·283	·105	·342	− ·008	·474	96·1	80·0	16·1	104·5	72·2	32·3	89·7	92·7	86·2	− 1·1	76·3	80·4	80·2	78·9
Hazaribagh	27·614	27·541	·073	27·587	+ ·010	?	99·5	?	?	105·0	?	?	93·2	95·2	?	?	?	71·6	71·9	?
Darjeeling	22·865	22·807	·059	22·835	− ·025	?	65·1	55·7	9·4	68·2	514	16·8	61·3	62·5	59·7	− 0·1	55·3	60·2	60·8	58·7
Pedong	25·136	25·058	·078	25·095	− ·002	?	74·4	65·2	9·2	78·4	61·0	17·4	70·7	72·3	69·3	+ 1·0	64·1	68·6	69·2	67·2
Berhampore	29·527	29·425	·102	29·483	− ·004	·498	94·0	79·3	14·7	101·2	74·3	26·9	86·8	91·6	85·3	+ 0·4	76·6	81·8	82·0	80·1
Burdwan	·506	·404	·101	·462	− ·001	·506	95·7	80·7	15·0	102·9	74·9	28·0	87·7	93·0	86·8	+ 1·4	77·7	80·9	81·8	80·1
Calcutta (Alipore)	·584	·494	·090	·545	0	·511	93·3	80·1	13·2	98·1	74·4	23·7	87·8	90·5	86·2	+ 1·4	77·6	81·1	82·0	80·2
Calcutta (Chowringhee)	·588	?	?	?	?	?	95·3	80·1	15·1	100·5	74·6	25·9	89·7	?	?	?	78·7	82·8	?	?
Saugor Island	·594	·506	·087	·556	+ ·008	·525	92·2	83·1	9·1	94·1	75·7	18·4	89·2	89·6	86·5	+ 1·7	79·7	83·5	84·0	82·4
Dacca	·613	·521	·093	·574	− ·007	·544	90·2	78·9	11·3	94·1	72·2	21·9	85 4	87·1	84·1	+ 0·9	76·5	81·2	81·8	79·8
Chittagong	·603	·517	·086	·566	− ·001	·600	88·2	77·4	10·8	90·9	70·6	20·3	85·4	85·3	81·8	+ 1·4	75·4	80·5	80·5	78·8
Demagiri	Not recorded.				?	?	88·0	76·4	11·6	91·4	70·4	21·0	84·5	85·3	81·6	+ 1·6	?	?	?	?
Tura	Ditto.				?	?	85·2	74·0	11·2	88·3	69·1	19·2	79·7	83·1	79·1		?	75·8	77·7	?
Dhubri	·527	·420	·107	·483	− ·018	·551	85·0	75·1	9·9	90·1	70 8	19·3	80·2	82·4	78·6	− 1·0	74·0	77·1	78·1	76·4
Sibsagar	·330	·206	·124	·272	− ·035?	·557	88·0	76·4	11·6	94·3	73·0	21·3	83·8	86·2	80·8	− 0·7	75·7	79·9	80·4	78·7
Silchar	·571	·469	·102	·530	− ·009	·585	89·5	75·8	13·8	94·0	70·4	23·6	84·0	85·3	81·2	− 0·4	74·6	78·9	79·4	77·6

II.

in India, Burma, &c., in the month of June 1891.

Vapour Tension.					Humidity.					Cloud.				Wind Direction.											Wind Steadiness.		Wind Velocity.		Station.
														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 mean.	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.	
·257	·312	·306	·291	– ·070	47	36	34	39	– 7	2·8	4·5	3·7	– 0·1	6	3	1	4	17	9	2	2	16	S. 14° E.	S. 2° W.	13	12	188	159	Murree.
3·85	·433	·390	·403	– ·063	56	39	29	41	– 7	1·6	4·1	2·8	– 1·5	11	8	1	1	2	...	2	6	29	N. 43° W.	N. 19° W.	60	21	108	118	Chamba.
·190	·199	·192	·194	?	73	37	32	47	?	1·9	4·6	3·3	– 2·4	...	3	...	...	6	10	17	16	8	S. 59° W.	S. 66° W	55	67	59	43	Kailang.
·264	·315	·314	·297	– ·116	50	43	38	44	– 19	2·9	3·4	3·2	– 2·8	2	3	7	4	3	5	16	8	1	S. 42° W.	S. 76° W.	22	40	?	?	Simla.
·389	·375	·377	·380	– ·131	44	24	19	29	– 8	2·0	2·3	2·2	+ 0·2	5	7	12	6	3	...	4	10	13	N. 15° W.	N. 50° E.	33	31	152	110	Peshawar.
·465	·451	·354	·423	– ·178	48	25	15	29	– 8	0·8	1·2	1·0	–2·2	11	4	3	6	9	3	1	10	13	N. 47° W	N. 19° W.	12	11	75	84	Lahore.
·575	·624	·591	·596	– ·030	59	36	27	41	– 6	0·9	1·0	1·0	– 2·0	12	2	...	5	4	8	...	23	6	S. 76° W.	N. 74° W.	33	10	67	59	Ludhiana.
·526	·552	·597	·558	– ·184	46	32	23	34	– 13	0	0	0	– 0·9	20	...	5	...	18	...	15	...	2	S 13° E.	S. 25° W	32	33	29	88	Mooltan.
·492	·584	·394	·490	– ·174	46	29	14	30	– 10	0·1	0·8	0·4	– 0·4	21	3	...	7	6	7	4	3	9	S. 10° W.	S. 31° E.	8	46	74	115	Jacobabad.
·781	·658	·637	·692	– ·053	76	38	31	48	– 4	1·3	1·8	1·6	+ 0·2	...	...	...	...	...	...	56	3	1	S. 48° W.	S. 39° W	97	78	319	366	Hyderabad.
·898	·951	·982	·944	– ·004	86	70	70	75	+ 1	2·7	3·0	2·9	– 1·5	...	...	...	...	...	...	22	37	1	S. 74° W.	S. 58° W.	92	85	456	449	Kurrachee.
·518	·576	·457	·517	– ·151	46	34	21	34	– 15	0·9	2·5	1·7	– 2·5	...	3	2	...	2	...	4	35	14	N. 77° W.	N. 57° W.	74	47	215	180	Jeypore.
·701	·720	·677	·699	+ ·025	62	46	33	47	– 4	0·6	1·3	0·9	– 2·5	...	...	1	1	...	...	1	53	4	N. 87° W.	S 61° W.	92	68	336	208	Ajmere.
·473	·555	·530	·519	– ·038	69	61	44	56	– 10	1·6	1·3	1·5	– 3·9	...	...	...	...	...	...	32	21	7	S. 70° W.	S. 42° W.	87	74	284	242	Mount Abu.
·315	·356	·371	·317	– ·057	61	49	49	53	– 10	2·9	3·4	3·2	– 1·9	3	3	1	1	...	3	16	31	2	S. 78° W	S. 73° W.	72	50	133	138	Chasrata.
·339	·412	·442	·397	– ·061	57	51	50	53	– 10	3·0	3·7	3·3	– 2·1	8	..	...	..	...	..	24	28	...	S. 69° W.	S. 65° W.	80	49	92	83	Ranikhet.
·421	·508	·485	·471	– ·043	69	56	46	57	– 9	3·7	4·1	3·9	– 1·8	26	...	1	...	9	5	18	...	1	S. 16° W.	S. 19° E.	40	25	81	68	Pithoragarh.
·475	·530	·484	·496	?	58	42	33	44	?	2·0	1·9	1·9	– 2·3	...	10	5	1	3	8	10	11	12	N. 77° W.	S. 66° W.	33	12	45	39	Dehra.
·546	·631	·507	·561	– ·070	60	43	29	44	– 7	0·6	0·6	0·6	– 2·5	11	...	1	1	11	7	...	25	4	S. 59° W.	S. 4° E.	35	11	104	94	Roorkee.
·618	·541	·459	·539	– ·142	63	34	24	40	– 10	1·2	1·4	1·3	– 1·9	2	...	2	3	14	3	1	23	12	S. 78° W.	N. 26° W.	30	22	81	64	Meerut.
·516	·587	·513	·539	– ·127	45	33	24	34	– 10	1·4	1·2	1·3	– 2·3	...	...	1	3	12	1	9	5	29	N. 75° W	N. 60° W.	33	28	173	138	Agra.
·633	·663	·560	·609	– ·150	61	44	31	44	– 11	3·2	2·6	2·9	– 1·7	...	4	7	14	2	...	6	15	12	N. 32° W.	N. 51° E.	23	17	70	102	Lucknow.
·652	·670	·596	·639	– ·121	60	40	29	43	– 11	2·6	3·3	3·0	– 1·5	3	9	7	3	1	1	...	11	25	N. 34° W	N. 2° E.	58	12	175	98	Allahabad.
·774	·773	·713	·753	– ·028	71	54	45	57	– 1	3·9	3·0	3·5	– 0·8	5	3	9	15	2	...	5	13	8	N. 3° E.	N. 74° E.	17	12	65	75	Ghazipur
·554	·630	·554	·584	– ·133	49	37	27	38	– 14	1·8	4·1	3·0	– 2·7	...	5	2	7	...	...	2	26	18	N. 61° W.	N. 72° W.	60	43	160	105	Nowgong
·527	·505	·408	·480	– ·150	50	30	21	34	– 15	1·1	2·1	1·6	– 3·1	2	10	2	1	...	1	1	20	23	N. 53° W	N. 59° W.	72	50	237	237	Sutna.
·903	·973	·941	·939	+ ·026	91	77	67	78	+ 1	4·1	2·9	3·5	– 1·2	2	1	9	29	13	1	2	2	1	S. 85° E.	S. 89° E.	68	71	144	137	Durbhunga.
·863	·913	·868	·881	+ ·007	84	68	60	71	+ 3	4·5	4·4	4·4	– 1·7	3	1	1	42	1	...	...	9	3	N. 85° E.	N. 73° E.	53	45	150	102	Patna.
?	·509	·499	?	?	?	35	34	?	?	5·7	8·4	7·1	– 0·2	1	6	2	4	5	8	4	12	18	N. 73° W.	S. 36° W.	32	19	242	213	Hazaribagh.
·436	·511	·517	·487	– ·004	98	91	91	94	0	9·8	9·0	9·4	+ 0·7	11	...	5	6	4	...	14	15	3	S. 64° W.	S. 88° E.	40	5	142	113	Darjeeling.
·589	·676	·680	·647	+ ·011	94	90	85	90	0	8·4	8·1	8·2	+ 0·5	Imperfect.									?	?	?	?	?	?	Pedong.
·886	1·019	·967	·957	+ ·021	88	80	66	78	– 5	7·0	6·0	6·5	– 1·7	...	1	2	15	10	21	6	4	1	S. 26° E.	S 32° E.	55	48	108	133	Berhampore.
·913	·960	·941	·938	+ ·008	87	74	62	74	– 3	5·6	5·7	5·7	– 1·5	2	2	1	2	9	27	12	5	...	S. 6° W.	S. 20° E.	65	58	118	116	Burdwan.
·920	·974	·983	·959	– ·011	89	74	69	77	– 6	5·4	5·3	5·4	– 1·6	...	1	1	3	7	26	16	4	2	S. 12° W.	S. 4° E.	64	59	138	147	Calcutta (Alipore).
·965	1·033	?	?	?	94	75	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	Calcutta (Chowringhee).
·975	1·074	1·091	1·047	+ ·022	85	78	78	81	– 2	7·5	7·9	7·7	+ 0·3	...	...	...	1	8	39	10	2	...	S. 3° W.	S. 15° W.	84	69	410	350	Saugor Island.
·887	1·013	1·022	·974	+ ·002	89	83	79	84	– 3	7·9	7·7	7·8	+ 0·2	1	1	2	5	11	36	3	1	...	S. 14° E.	S. 16° E.	75	75	198	171	Dacca.
·855	·978	·979	·937	+ ·094	91	80	81	84	– 2	8·2	8·1	8·2	+ 0·7	...	...	1	1	11	25	19	1	...	S. 6° W	S 31° E.	77	56	141	166	Chittagong.
?	?	?	?	?	?	?	?	?	?	4·0	5·5	4·8	+ 0·1	1	...	...	3	56	...	...	...	...	S. 47° E.	S. 29° E	93	23	?	?	Demagiri.
?	·851	·890	?	?	?	84	79	?	?	6·7	5·8	6·3	– 0·4	...	1	4	8	21	3	21	2	...	S. 17° E	S. 3° W.	50	57	?	?	Tura.
·829	·892	·910	·877	– ·022	95	87	82	88	+ 1	8·4	7·1	7·8	+ 0·6	15	3	19	9	3	1	7	1	2	N. 60° E.	S. 84° E.	33	23	130	116	Dhubri.
·876	·969	·960	·935	+ ·019	97	84	77	86	+ 2	8·8	7·3	8·1	– 0·3	...	...	29	2	12	...	15	1	1	N. 83° E.	S. 77° E.	31	11	47	62	Sibsagar.
848	·919	·926	·898	– ·009	95	79	76	83	– 2	8·5	8·2	8·4	+ 0·7	27	3	4	9	5	1	3	7	1	S. 89° E.	N. 58° E.	10	9	32	73	Silchar.

Table

Abstract of Observations recorded at 10 A.M. and 4 P.M. at 89 stations

Station.	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 to 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.
False Point	29·603	29·512	·091	29·562	− ·014	29·521	91·9	81·1	10·8	101·0	75·6	25·4	89·3	89·1	85·3	+ 1·2	78·3	83·1	83·4	81·6
Cuttack	·532	·423	·109	·487	− ·015	·507	101·1	81·7	19·4	107·9	73·8	34·1	92·6	99·6	90·2	+ 4·4	77·5	81·7	81·4	80·2
Sambalpur	·116	28·995	·121	·065	− ·013	·461	104·9	82·4	22·5	111·7	74·9	36·8	94·9	102·4	92·1	+ 4·9	74·4	78·1	78·2	76·9
Raipur	28·648	·524	·124	28·591	− ·012	·466	106·7	83·1	23·6	113·7	71·1	42·6	98·8	103·9	93·3	+ 7·5	68·3	74·7	74·8	72·6
Khandwa	·666	·530	·103	·603	+ ·034	·575	102·9	80·6	22·3	109·7	67·1	42·6	91·4	101·0	91·1	+ 4·2	71·6	75·6	75·9	74·4
Hoshangabad	·668	·531	·137	·605	+ ·018	·549	105·7	83·4	22·3	112·5	74·9	37·6	94·7	104·4	93·9	+ 6·1	74·1	80·8	82·7	79·2
Saugor	27·909	27·791	·117	27·855	+ ·037	·507	104·6	80·5	24·1	111·9	72·6	39·3	94·5	100·7	91·4	+ 6·4	67·4	73·6	73·6	71·5
Jubbulpore	28·313	28·206	·107	28·265	+ ·028	·507	103·1	80·2	22·9	110·4	73·0	37·4	94·5	99·4	90·6	+ 3·7	69·8	74·8	75·1	73·2
Pachmarhi	26·333	26·235	·098	26·289	+ ·047	?	94·0	?	?	100·2	?	?	84·7	91·9	?	?	?	68·8	68·2	?
Seoni	27·647	27·542	·105	27·600	+ ·012	·507	102·4	77·6	24·8	108·2	70·0	37·6	93·5	97·7	88·2	+ 6·3	66·5	72·6	72·9	70·7
Nagpur	28·622	28·484	·138	28·558	− ·005	·500	108·9	84·7	24·2	113·9	78·2	35·7	98·7	104·2	94·7	+ 8·9	69·4	76·8	76·3	74·2
Chanda	29·001	·892	·139	·967	− ·008	·524	108·6	83·5	25·2	113·9	71·4	42·5	97·1	105·8	94·4	+ 7·7	72·7	75·2	76·1	74·7
Sironcha	·279	29·129	·151	29·210	− ·048	·539	108·0	86·2	21·8	114·9	72·9	42·0	96·9	105·7	95·6	+ 8·5	73·4	77·2	77·6	76·0
Chikalda	26·190	26·111	·079	26·156	+ ·025	?	91·7	71·0	20·7	96·8	65·1	31·7	80·8	89·8	80·6	+ 5·1	64·3	68·6	68·2	67·0
Buldana	27·608	27·499	·109	27·558	+ ·017	·577	99·0	75·1	23·9	104·0	68·4	35·6	88·7	96·1	85·4	+ 4·7	67·8	72·1	71·1	70·3
Akola	28·781	28·639	·141	28·715	+ ·023	·571	105·2	80·7	24·6	111·6	72·7	38·9	93·5	103·8	91·7	+ 6·2	70·8	75·2	74·8	73·6
Mashla	Not recorded.						96·8	74·5	22·3	105·2	65·0	40·2	85·0	93·7	84·0	+ 7·3	67·7	71·9	71·8	70·5
Deesa	29·238	29·114	·125	29·181	+ ·055	·587	105·9	81·1	24·8	112·0	77·8	34·2	93·0	104·5	92·6	+ 2·6	74·9	76·6	77·0	76·2
Bombay	·784	·706	·078	·744	+ ·075	·720	90·5	81·6	8·9	93·2	76·0	17·2	86·4	87·6	85·5	+ 2·3	77·1	79·5	79·8	78·8
Poona	27·964	27·877	·088	27·927	+ ·050	·679	96·0	74·0	22·0	102·6	70·9	31·7	87·0	89·9	83·3	+ 3·9	69·4	72·3	72·7	71·5
Sholapur	28·204	28·060	·144	28·142	+ ·023	·644	101·1	74·8	26·3	107·7	69·8	37·9	88·2	97·7	86·2	+ 4·5	69·4	73·2	74·5	72·4
Ratnagiri	29·721	29·640	·080	29·679	+ ·046	·725	90·7	79·1	11·6	93·5	73·4	20·1	87·5	87·6	84·3	+ 3·2	76·2	78·6	78·9	77·9
Karwar	·819	·752	·067	·784	+ ·036	·760	86·4	78·4	8·1	91·4	73·0	18·4	82·4	84·0	82·0	+ 2·3	75·7	77·6	77·9	77·1
Belgaum	27·318	27·238	·082	27·281	+ ·031	·705	86·8	69·0	17·8	93·1	66·6	26·5	80·5	81·5	76·1	+ 3·7	66·8	70·7	71·1	69·7
Secunderabad	·971	·845	·126	·918	− ·001	·598	101·7	77·8	23·9	107·8	71·9	35·9	84·8	98·9	88·2	+ 6·4	71·7	76·6	77·6	75·3
Vizagapatam	29·620	29·521	·099	29·575	− ·017	·543	92·1	84·7	7·4	100·0	79·0	21·0	90·4	91·7	87·8	+ 0·1	76·1	80·7	81·0	79·3
Bellary	28·335	28·213	·122	28·284	+ ·017	·678	97·9	76·6	21·3	102·9	71·0	31·9	87·8	95·0	85·6	+ 2·8	70·9	74·9	74·8	73·5
Madras																				Register not
Salem	·917	28·792	·125	·869	− ·002	·736	95·5	74·7	20·8	100·6	70·0	30·6	85·6	92·1	83·9	+ 1·5	71·6	75·6	77·3	74·8
Mercara	26·204	26·136	·068	26·170	+ ·012	·817	75·0	63·8	11·2	82·1	61·4	20·7	68·7	69·8	67·4	+ 0·8	62·7	66·2	67·8	65·6
Trichinopoly	29·569	29·440	·129	29·519	+ ·001	·701	101·4	79·3	22·1	106·2	75·5	30·7	92·0	97·8	88·9	+ 2·4	75·1	77·3	78·9	77·1
Cochin	·920	·850	·070	·884	+ ·028	·822	83·9	75·0	8·9	89·2	73·2	16·0	79·6	80·5	78·8	− 0·5	73·8	76·2	76·4	75·5
Wellington	24·230	24·167	·063	24·199	+ ·034	...	73·3	57·6	15·7	75·2	54·7	20·5	69·7	67·4	64·9	+ 1·1	55·3	62·6	61·8	59·9
Asyab	29·709	29·625	·084	29·670	− ·007	·633	87·0	80·1	6·9	89·4	73·5	15·9	83·0	83·5	82·4	+ 1·1	74·4	79·8	80·0	78·1
Diamond Island	·752	·680	·071	·712	− ·012	·688	85·6	72·1	13·5	89·8	66·8	23·0	82·4	80·9	77·1	− 2·3	71·6	78·3	76·9	75·6
Rangoon	·742	·657	·085	·709	− ·029	·689	91·9	75·7	19·5	103·1	72·9	30·2	80·6	80·9	81·1	+ 1·8	71·0	78·2	77·8	76·7
Mergui	·768	·688	·080	·724	− ·014	·751	84·1	70·4	13·6	89·1	67·0	22·1	80·1	80·9	76·5	− 1·4	69·0	77·2	77·2	74·4
Cocos Island	·693	·630	·063	·657	...	·699	86·7	?	?	91·4	?	?	83·4	83·0	?	...	?	79·4	79·1	?
Port Blair	·770	·702	·069	·732	+ ·007	·724	86·0	78·2	7·9	88·5	73·5	15·0	83·2	82·5	80·7	− 0·1	75·2	79·4	78·5	77·7
Quetta	24·545	24·483	·061	24·507	+ ·073	?	86·3	53·4	32·9	95·6	46·0	49·6	79·4	85·6	70·2	− 4·0	47·9	56·8	58·3	54·3
Leh	19·690	19·596	·094	19·649	+ ·010	?	71·5	41·3	30·2	79·2	33·6	45·4	60·3	68·3	55·2	− 0·1	34·1	43·6	46·7	41·5
Katmandu	Imperfect.						89·0	65·7	23·1	98·2	61·7	36·5	76·2	79·6	75·0	− 0·1	64·4	69·0	69·5	67·6
Minicoy	29·945	29·872	·073	29·905	?	29·840	83·5	78·7	4·8	86·3	74·2	12·1	81·7	80·6	80·8	?	75·3	78·1	78·3	77·2
Ferim	29·579	29·476	·103	29·528	?	?	96·1	87·0	8·9	102·9	83·4	19·5	91·2	92·5	90·5	?	72·5	82·7	82·7	79·3
Aden	29·707	29·594	·113	29·651	+ ·040	·675	93·4	83·5	9·9	96·9	76·7	20·2	90·2	91·8	88·1	+ 0·4	74·2	80·6	79·9	78·2
Zanzibar	30·092	·990	·105	30·041	?	30·041	80·6	73·8	6·	82·3	72·6	9·7	76·	80·2	77·1	?	70·7	73·2	75·4	72·

II—*concluded.*

in India, Burma, &c., in the month of June 1891—concluded.

Vapour tension.					Humidity.					Cloud.				Wind Direction.											Wind Steadiness		Wind Velocity.		Station.
														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 mean.	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.	
·934	1·053	1·068	1·019	+·060	88	77	78	81	− 2	7·8	7·2	7·5	+0·6	...	...	..	...	1	44	12	3	...	S 12° W	S. 45° W.	90	63	343	285	False Point.
·895	·935	·831	·887	−·002	82	61	45	63	−10	5·1	5·0	5·1	−1·5	2	2	3	3	2	18	21	7	2	S. 30° W.	S. 31° W.	55	53	83	96	Cuttack.
·749	·735	·639	·708	−·117	69	47	34	50	−15	4·0	3·9	4·0	−1·6	...	2	...	3	3	1	27	17	7	S. 67° W.	S. 59° W.	65	42	78	89	Sambalpur.
·496	·537	·471	·501	−·224	46	32	24	34	−28	3·9	7·5	5·7	−0·8	...	6	1	1	...	...	15	23	14	N. 82° W.	S. 74° W.	70	66	255	216	Raipur.
·674	·688	·583	·648	−·064	64	48	31	48	−11	2·6	3·4	3·0	−3·0	1	3	1	...	...	1	1	27	26	N. 66° W.	N. 77° W	84	71	335	228	Khandwa.
·729	·875	·845	·817	+·080	64	55	39	53	− 6	2·1	3·6	2·9	−3·0	...	2	...	...	...	1	16	28	13	S. 89 W.	S. 88° W.	82	71	206	110	Hoshangabad.
·510	·570	·491	·524	−·068	50	38	26	38	−14	2·5	3·8	3·1	−1·1	...	8	1	...	1	3	12	21	14	N. 80° W	S. 82° W.	65	63	186	126	Saugor.
·604	·617	·569	·596	−·091	60	40	34	44	−15	2·0	3·8	2·9	−3·5	2	6	2	...	...	3	3	25	19	N. 68° W.	N. 80° W.	70	54	102	126	Jubbulpore.
?	·519	·418	?	?	?	46	30	?	?	3·7	5·3	4·5	−2·1	...	1	...	...	...	5	26	20	8	S. 68° W.	N. 71° W.	76	63	237	185	Pachmarhi.
·514	·543	·502	·520	−·149	55	36	31	41	+22	3·2	5·4	4·3	+0·1	...	8	1	2	...	3	9	17	20	N 69° W.	S. 83° W.	62	47	117	137	Seoni.
·531	·649	·559	·580	−·130	45	36	28	37	−24	2·6	5·6	4·1	−3·0	...	3	3	...	1	2	8	21	22	N. 73° W.	N. 76° W.	68	52	308	183	Nagpur.
·663	·582	·499	·582	−·150	59	35	24	39	−21	2·0	4·3	3·2	−3·8	2	1	1	1	2	...	3	38	12	N. 82° W.	W.	77	54	107	153	Chanda.
·653	·675	·566	·630	−·144	53	40	26	40	−24	2·8	4·1	3·5	−2·7	12	5	...	...	2	6	6	18	11	N. 87° W.	S. 72° W.	45	50	109	108	Sironcha.
·530	·561	·443	·511	−·082	71	55	33	53	−18	4·7	5·6	5·1	−1·6	1	17	1	...	...	...	...	5	36	N. 34° W.	N. 45° W.	89	64	309	233	Chikalda.
·593	·583	·453	·543	−·131	69	44	28	47	−19	2·9	2·8	2·9	−3·2	...	12	1	...	...	...	1	5	41	N. 40° W	N. 75° W.	89	65	310	257	Buldana.
·623	·628	·477	·576	−·104	61	41	23	42	−15	4·9	6·0	5·5	−0·9	...	3	...	...	...	..	...	2	55	N. 44° W.	N. 71° W.	97	71	375	214	Akola.
?	?	?	?	?	?	?	?	?	?	4·3	4·4	4·4	−3·6	...	6	...	...	...	...	4	5	45	N. 49° W.	S. 85° W.	87	51	?	?	Makhla.
·783	·696	·562	·680	−·053	74	45	26	48	− 5	3·9	3·2	3·6	−1·3	...	23	1	...	...	...	...	...	36	N. 27° W.	S. 36° W.	92	72	462	403	Deesa.
·871	·916	·913	·900	−·028	81	73	70	75	− 7	5·0	5·4	5·2	−2·6	...	...	...	...	1	7	12	32	8	S. 77° W.	S. 63° W.	76	66	298	387	Bombay.
·664	·611	·588	·621	−·064	79	48	43	57	−13	4·9	5·8	5·4	−2·0	...	...	...	...	...	1	13	31	15	N. 89° W.	S. 79° W.	85	73	410	381	Poona.
·654	·631	·564	·616	+·009	76	48	33	52	− 7	3·8	7·1	5·5	−1·6	...	...	1	...	...	1	18	31	9	S. 82° W.	N. 86° W.	84	66	252	291	Sholapur.
·866	·861	·872	·866	+·018	87	67	67	71	− 6	4·3	5·3	4·8	−1·7	...	9	...	...	...	11	17	6	17	S. 86° W.	S. 53° W.	50	66	225	281	Ratnagiri.
·857	·883	·877	·872	+·030	88	80	75	81	− 3	5·8	5·3	5·5	−1·8	6	3	...	...	...	...	14	19	18	N. 82° W.	S. 76° W.	70	76	80	?	Karwar.
·644	·631	·640	·638	−·025	91	61	61	71	−10	5·9	6·4	6·2	−1·6	...	...	...	...	...	2	14	25	6	S. 79° W.	S. 73° W.	67	86	514	583	Belgaum.
·702	·752	·686	·713	+·072	75	54	38	56	− 4	4·2	4·8	4·5	−1·1	2	1	...	1	...	1	6	24	25	N. 73° W	S. 80° W.	78	82	297	299	Secunderabad.
·784	·925	·924	·878	−·004	65	65	64	65	− 3	5·5	6·2	5·9	−0·1	...	...	...	...	2	13	24	18	3	S. 50° W.	S. 58° W.	75	63	88	89	Vizagapatam.
·687	·701	·611	·666	+·015	75	53	38	55	− 3	5·2	7·3	6·3	−1·2	11	...	...	...	...	...	1	33	15	N. 78° W.	S. 86° W.	75	80	269	256	Bellary.
																													Madras.
received,																													
·734	·753	·740	·742	−·014	85	62	50	66	− 4	4·4	7·0	5·7	−0·1	...	1	1	2	1	30	18	5	2	S 21° W.	S. 58° W.	73	82	77	115	Salem.
·558	·618	·662	·613	+·012	93	88	91	91	− 2	8·1	8·8	8·5	−0·9	...	...	...	...	...	...	1	45	14	N. 81° W.	N. 81° W.	94	86	141	204	Mercara.
·816	·741	·735	·764	+·051	81	49	42	57	0	3·6	5·2	4·4	−2·3	...	...	...	...	3	2	17	30	8	S. 77° W.	N. 88° W.	78	84	258	228	Trichinopoly.
·820	·860	·857	·846	−·008	94	85	82	87	− 1	8·8	8·9	8·9	+1·3	7	3	2	2	...	1	6	15	24	N. 64° W.	S. 75° W.	61	42	109	?	Cochin.
·418	·495	·496	·470	+·030	87	69	74	77	+ 3	6·2	7·5	6·8	−0·6	...	12	1	...	5	14	15	8	5	S. 56° W.	N. 88° W.	35	52	67	126	Wellington.
·777	·978	·981	·912	−·004	76	87	85	83	− 3	8·9	8·4	8·7	+1·5	...	...	2	6	7	33	5	5	2	S. 4° E.	S. 2° E.	65	58	86	96	Akyab.
·773	·915	·878	·853	−·040	98	82	83	88	+ 1	8·3	8·6	8·5	+0·8	1	2	2	...	...	7	32	12	4	S. 57° W.	S. 32° W.	72	75	171	210	Diamond Island.
·817	·938	·913	·890	−·012	92	90	87	90	+ 1	9·2	8·9	9·0	+0·3	...	...	1	1	4	11	22	9	1	S. 36° W.	S. 16° W.	59	71	108	130	Rangoon.
·689	·899	·887	·825	−·028	92	88	84	88	− 1	9·7	9·5	9·6	+0·5	...	...	...	2	2	4	42	1	9	S. 50° W.	S. 48° W.	73	62	58	46	Mergui.
?	·954	·943	?	?	?	83	83	?	?	8·3	8·7	8·5	?	...	...	...	...	2	1	54	3	...	S. 44° W.	?	95	?	?	?	Cocos Island.
·844	·955	·925	·908	−·007	87	85	84	85	− 1	8·7	8·8	8·8	+1·7	1	...	1	...	...	2	31	25	...	S. 63° W.	S. 38° W.	87	82	339	230	Port Blair.
·279	·230	·207	·239	−·144	68	23	15	35	− 8	0·3	0·8	0·6	−0·3	36	...	...	...	...	...	1	11	12	N. 69° W.	N. 69° W.	37	43	32	106	Quetta.
·137	·137	·136	·137	−·035	52	27	19	33	− 6	2·9	4·4	3·7	−1·3	15	1	3	2	...	3	15	12	9	S. 81° W.	S. 84° W.	40	26	31	58	Leh.
·591	·627	·598	·605	−·021	93	70	61	75	0	6·9	7·1	7·0	+1·4	7	3	3	14	7	..	3	15	8	N 25° W.	S. 86° W.	7	61	26	?	Katmandu.
·833	·914	·927	·891	?	85	84	86	85	?	6·7	7·3	7·0	?	0	0	0	0	0	3	38	18	1	S. 57° W.	?	90	?	464	?	Minicoy.
·606	1·006	·988	·864	?	48	69	65	60	?	1·1	0·9	1·0	?		1	1	23	11	1	1	9	7	S. 81° E.	?	27	?	426	?	Perim.
·725	·918	·865	·836	−·024	63	65	58	62	+ 5	1·7	1·2	1·5	+0·2	14	1	3	2	8	24	8	...	...	S. 7° E.	S. 2° E.	53	68	171	203	Aden.
·710	·781	·732	·740	?	85	87	71	81	?	3·9	4·5	4·3	?	...	...	2	...	7	37	10	1	1	S. 3° W.	?	81	?	?	?	Zanzibar.

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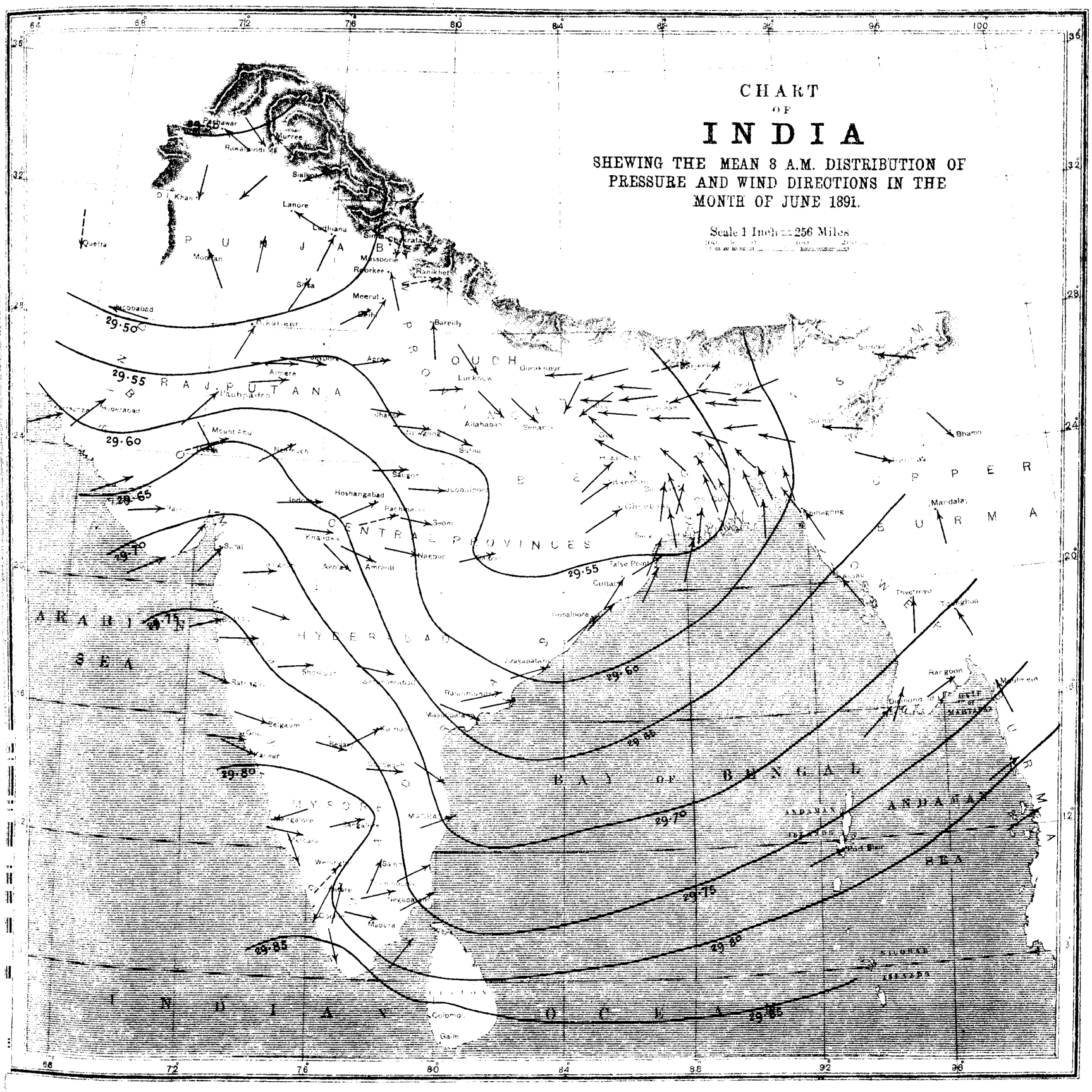


Explanation.

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.

S. No. 524, Wr., I.—D... 16 Litho., 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.

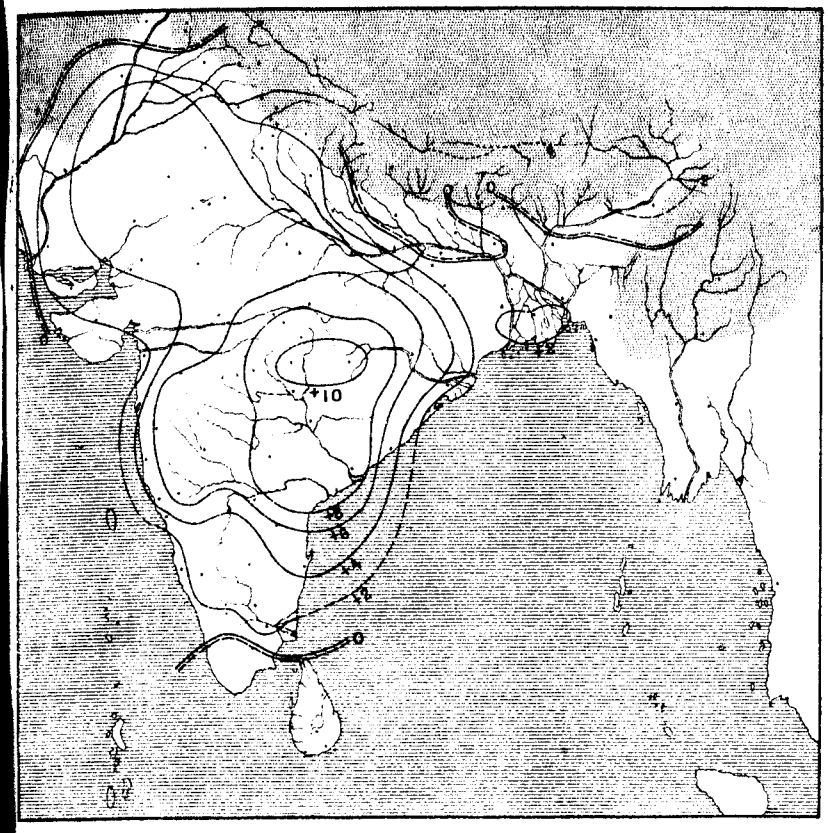


CHART SHEWING THE VARIATION OF THE MEAN MINIMUM TEMPERATURE OF THE MONTH FROM THE NORMAL.

Explanation.

Continuous lines indicate that the mean 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.

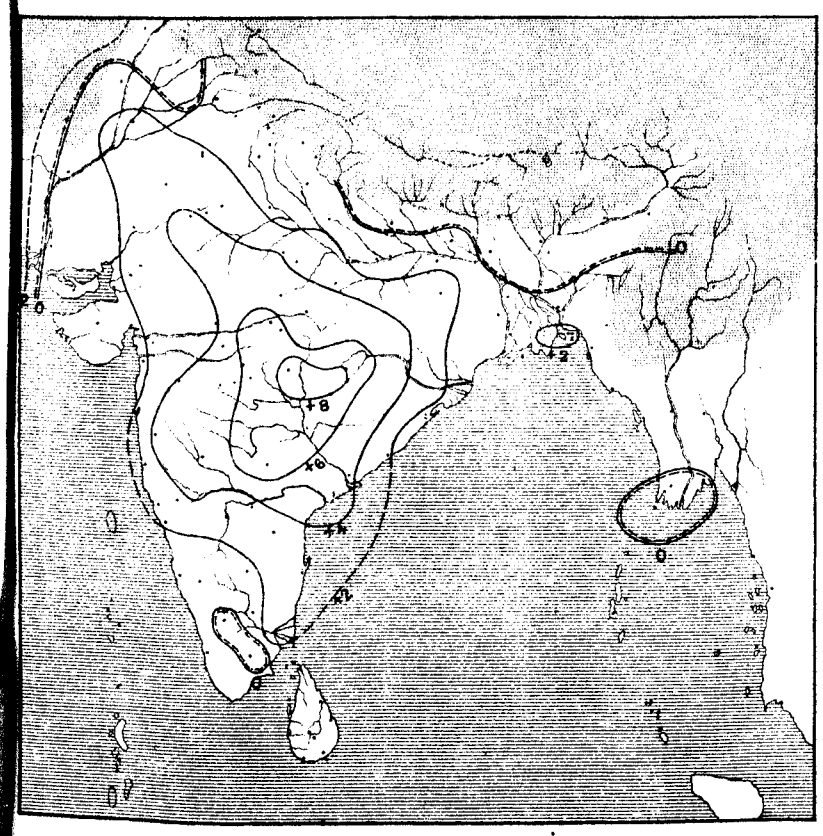
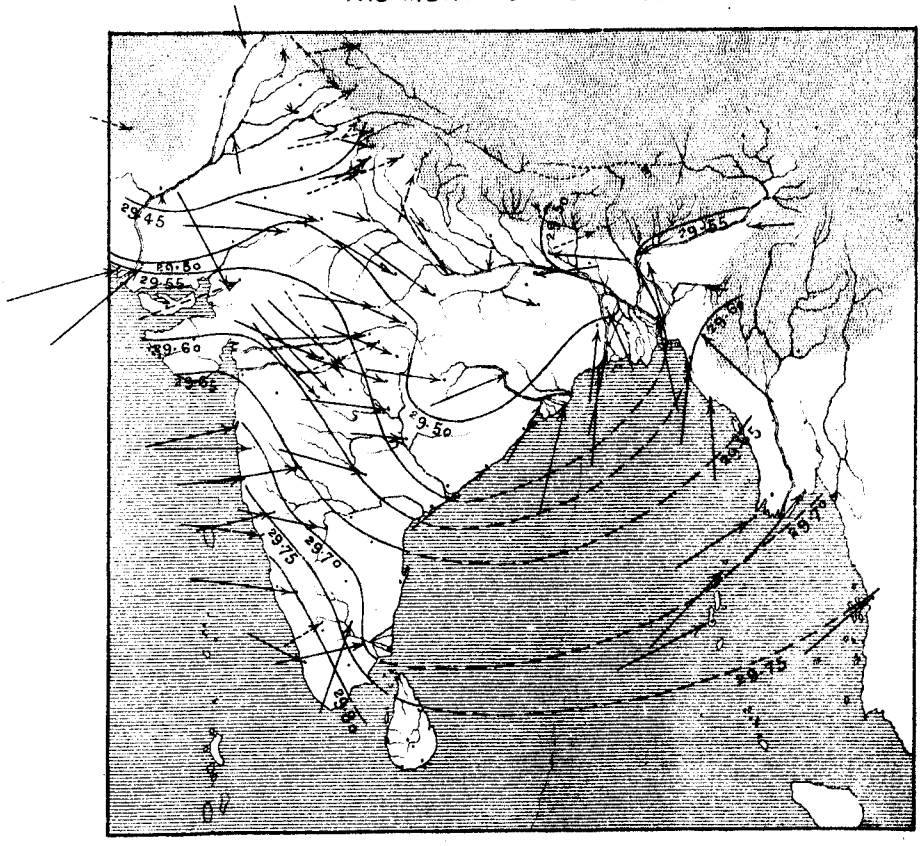


CHART SHEWING THE MEAN DISTRIBUTION OF PRESSURE AND THE RESULTANT WIND DIRECTIONS IN THE MONTH OF JUNE 1891.



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. S. I. O. 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. 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 51 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 name of the districts 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
3. Central do.
4. Upper do.
5. Arakan
6. Eastern Bengal
7. Assam (Surma)
8. Do. (Brahmaputra)
9. Deltaic Bengal
10. Central do.
11. North do.
12. Orissa
13. Chota Nagpore
14. Behar (South)
15. Do. (North)
16. North Western Provinces (East)
17. Oudh (South)
18. Do. (North)
19. North Western Provinces (Central)
20. Do. do. (West)
21. Do. do. (Submontane)
22. Punjab (South)
23. Do. (Central)
24. Do. (Submontane)
25. Do. (Hill Districts)
26. Do. (North West)
27. Punjab (West)
28. Malabar
29. Madras (South Central)
30. Coorg
31. Mysore
32. Konkan
33. Bombay Deccan
34. Hyderabad (North)
35. Khandeish
36. Berar
37. Central Provinces (West)
38. Do. (Central)
39. Do. (East)
40. Guzerat
41. Kattiawar
42. Sind
43. Central India (East)
44. Rajputana (East) Central India (West)
45. Rajputana (West))
46. East Coast (North)
46(a.) Do. do. (a)
47. Hyderabad (South)
48. Madras (Central)
49. East Coast (Central)
50. East Coast (South)
51. Madras (South)

Reg. No. 634, Wr. I.—Dec. 91.—415.

GOVERNMENT OF INDIA.

METEOROLOGICAL DEPARTMENT.

MONTHLY WEATHER REVIEW,

PUBLISHED BY ORDER OF

THE GOVERNMENT OF INDIA.

CALCUTTA, JULY, 1891.

INTRODUCTION.

THIS review of the weather in India during the month of July 1891, is based on observations taken at 8 A.M. daily at 159 stations, and on additional observations taken at 10 A.M. and 4 P.M. at 89 stations. The rainfall summary is based on the rainfall data of the meteorological observatories and of the rainfall telegrams received during the month from District Officers throughout India. 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 July 1891.

The South-West monsoon circulation is usually fully established over nearly the whole of India before the end of June, and prevails with great steadiness during the whole of July. If the monsoon currents are feebler than usual, the rains may be considerably delayed in North-Western and Central India and not be fully established until the middle or end of July.

The month is hence usually a period of frequent, and in some districts of almost constant, rainfall and of comparative uniformity of temperature and of high humidity over the greater part of the country. The only areas in which the rainfall is small in amount, and in which hot weather conditions continue in a somewhat mitigated form, are Sind, North-West Rajputana and the West Punjab.

The distribution of rainfall during the month depends largely upon the relative strength of the two branches of the monsoon current. The Bombay branch advances usually in an easterly direction across the Peninsula and in a north-easterly direction across Central India and Rajputana towards the East Punjab. The Bay of Bengal branch of the current in part advances over Burma and in part crosses the Bengal coast and is deflected westwards up the Gangetic valley towards the Punjab. The goal of both branches of the monsoon current would hence appear to be the Punjab. But the greater part of the ascensional motion which is the continuation of the horizontal movement takes place in the Deccan, Central India and the Gangetic plain, as well as in the coast districts, all of which receive more or less general and heavy rain during the month. It is only when at least one branch of the monsoon current is blowing strongly that humid winds advance into the Punjab and give fairly general rain, chiefly in the eastern districts.

Between the two areas in which the two branches of the monsoon current or circulation exclusively prevail is a long narrow belt of country which forms a kind of debatable ground between the two currents and in which there is much interaction. In this belt pressure is somewhat lower

than it is either further to the north or south, and hence it forms a trough of low pressure. The trough in July usually stretches from Orissa through Chutia-Nagpur to Upper Sind or the South-West Punjab.

An important feature of the meteorology of the month is the occasional formation of shallow cyclonic storms in the north of the Bay of Bengal or South Bengal. They usually advance in a west to a west-north-west direction along the trough of low pressure. These cyclonic whirls draw into them the humid winds advancing across the coasts of India and discharge their moisture as more or less heavy cyclonic rainfall over the areas they traverse. They hence tend to make the rainfall distribution of the month more irregular in Northern and Central India than it would otherwise be. On the other hand their advance westward is always accompanied and followed by a strong influx of humid winds across the Bengal coast. Hence they give rise at the same time to more or less general rain over Northern India.

The monsoon currents were fully established over the Arabian Sea and Bay of Bengal at the commencement of the month under discussion. The current in the Bay was not only below its normal strength at the beginning of the month but was directed more strongly than usual to Burma, and hence Tenasserim, Arakan and Lower Burma had even heavier and more persistent rain than usual. The Bengal current was also giving fairly steady rain at that time to Bengal, Assam, Chutia-Nagpur and Behar. At the beginning of the month the Arabian Sea current was also slightly below its normal strength. It was however giving heavy rain in the West Coast Districts and light to moderate rain in the Deccan and Central Provinces. Skies were partially clouded and showers were of occasional occurrence in Central India. The pressure conditions were approximately normal, and the trough of low pressure stretched from Orissa to the South-West Punjab. Temperature was very considerably above the normal over the whole of North-Western India. No change of importance occurred until the 5th, when the trough of low pressure was transferred northwards to the foot of the hills between Sialkot and Purneah. This was almost immediately followed by the setting in of dry westerly winds over the whole of Central India and the Gangetic plain and by an almost complete break in the rains in the Central Provinces, the Deccan, Chutia-Nagpur and Behar. Some very heavy downpours were received in North and East Bengal during the period whilst the easterly current was retreating down the Gangetic plain. The downpour was most excessive in the Chittagong District and the Chittagong Hill Tracts. Bandarban in the Chittagong Hill Tracts obtained 44 inches (the total fall of the month being 55·64 inches) between the 5th and 9th, and Satkanya in the Chittagong District 41 inches during the same period. The total rainfall of the month at Satkanya was 54·83 inches.

Pressure decreased in Upper India on the 8th, 9th and 10th, and very steep gradients obtained on the 10th and 11th in North-Western India and the Peninsula. During this period the trough of minimum pressure continued to occupy a very abnormal position along the foot of the hills from Rawalpindi to Purneah. Strong dry westerly winds prevailed in the Gangetic plain and Central India, and rainfall was confined to the West Coast Districts, Bengal, Assam and Burma. The monsoon humid currents across the Bombay and Bengal coasts also fell off in strength at this time, and the rainfall diminished in amount in the coast districts. This decrease was most strongly shown in the Bombay current on the 10th, 11th and 12th when the rainfall in the West Coast Districts was small in amount and restricted to light local showers. During this period the distribution of pressure gradually changed in Northern India, the trough or area of minimum pressure being transferred southwards on the 11th and 12th to its normal position between Orissa and the South-West Punjab.

In consequence of the almost entire break in the rains at this time over the whole of India except Burma, Bengal and Malabar, a rapid increase of temperature occurred, and temperature on the 11th and 12th was from 4° to 15° above the normal over the interior of India.

On the 13th rain began to increase slowly in amount in the West Coast Districts, and re-commenced in the Central Provinces and Berar. Rainfall also increased and became more general in Bengal. On the 15th, pressure increased rapidly in North-Western and Central India and fell in North-Eastern India. In consequence of these changes a shallow depression formed in Central Bengal, and the trough of low pressure was again transferred northwards to the foot of the hills. The depression in Bengal gave general and moderately heavy rain to the whole of Bengal and Assam on the 16th, 17th and 18th, after which it filled up.

The monsoon winds were weak on the Bombay coast at this time, but they began to increase in force in the centre of the Arabian Sea on the 17th and 18th, and this increase extended rapidly eastwards. They began to give a high sea, monsoon squalls and gales, and general rain on the West Coast on the 19th. At the same time pressure gave way briskly to rapidly in North-Western and Central India, and the trough of low pressure was transferred back to its normal position. Rainfall increased in the Central Provinces, and easterly humid winds advanced westwards up the Gangetic plain.

The Arabian Sea current was strong during the remainder of the month, and gave heavy rain to the West Coast Districts and more or less general rain in the Peninsula.

Winds became light and feeble in the Gangetic plain and Bengal, and the rainfall diminished in amount and was partial and local in its distribution on the 20th and 21st. This was immediately followed by the formation of the first

cyclonic storm of the rains. The first indications of its generation were shown on the 23rd by the shift of winds in South-West and Central Bengal and by the increasing strength of the winds in the east of the Bay as indicated by the Diamond Island and other observations. Ships' logs show that westerly winds at the head of the Bay increased in force from an average of 3 on the 22nd and 23rd to an average of 8 on the 25th, on the morning of which day a small but well marked depression covered South-West Bengal and the north-west angle of the Bay. The centre of the depression was nearly midway between Saugor Island and Calcutta. At 8 A.M. of that day whilst this storm was forming, the Bombay monsoon current had advanced in strength across Central India into Eastern Rajputana, South-East Punjab and the western Districts of the North-Western Provinces, and gave general rain to those districts on the 23rd and 24th. A rapid reduction of temperature hence occurred over those districts. Rainfall in North-Eastern India on the 22nd, 23rd and 24th during the formation of the storm was almost restricted to Burma, Assam and East Bengal. The intermediate areas including West Bengal, Chutia-Nagpur, Behar and the Eastern districts of the North-Western Provinces obtained little or no rain during the period whilst the cyclonic storm in South-West Bengal was forming and developing. The storm began to advance westwards on the afternoon of the 25th, and drifted along the trough of low pressure, which ran at this time from South-West Bengal to Upper Sind, at a rate which gradually increased from 7 to 11 miles per hour. The centre was a little to the west of Chyebassa on the morning of the 26th, and passed between Jubbulpore and Sutna on the afternoon of the 27th. As the whirl advanced westwards, humid easterly winds extended across Behar into the North-Western Provinces, and the humid current from the Bombay coast was drawn into it and increased the rainfall in the cyclonic area and maintained the circulation. The whirl advanced through the Eastern States of Central India on the 28th into Central Rajputana, and gave a heavy general burst of rain on the 27th and 28th to Central India and Rajputana. It was in the Western Districts of Rajputana on the 29th, but was then filling up rapidly. It filled up in Upper Sind on the 30th, after having given some showers in Sind on the 29th and 30th.

This cyclonic whirl hence gave a general burst of rain over the whole of Northern and Central India, and carried the monsoon current into Rajputana and the Punjab and established the monsoon in these areas. The Bombay current fell off rapidly in strength on the 29th and 30th, and was slightly below its normal force on the 31st, but continued to give fairly general and moderate rain to North-Western and Central India. The Bengal current fell off greatly in strength on the 29th and 30th, and the winds shifted in the manner indicative of the formation of a cyclonic storm. A shallow depression was shown in the north of the Bay on the 31st, which developed into a cyclonic storm that formed the chief feature of the weather of the first week of August.

Temperature was largely in excess over the whole of North-Western and Central India (including Rajputana, the Punjab, North-Western India and the Central India States) during the first three weeks of the month, and it was not until the cyclonic storm of the fourth week of the month had advanced into Central India and Rajputana that the normal monsoon conditions of moderate temperature were established. The hottest period in North-Western India was during the four or five days preceding this change. The following gives the mean variation of the temperature from the normal in North-Western India day by day from the 19th to the 22nd :—

DISTRICT.	Variation of mean temperature from normal.			
	19th. °	20th. °	21st. °	22nd. °
Central India . . .	+3·9	+5·4	+5·4	+ 6·2
Sind and Rajputana .	+5·0	+6·7	+8·5	+ 9·4
North-Western Provinces .	+4·4	+6·4	+8·1	+ 6·5
Punjab	+3·4	+6·0	+8·4	+10·8

The 22nd was the hottest day of the month in Upper India. The mean day or maximum temperature of the Punjab was 115½°, and the highest maximum temperature of the day was registered in Upper Sind at Jacobabad (119°).

Temperature fell rapidly during the next three or four days, and at the end of the month it was either normal or slightly in defect over the whole of India except Madras, where there had been throughout the month a moderate excess due to the deficient rainfall or drought in that area.

The mean temperature of the month was hence largely in excess in the Punjab, Rajputana, Central India and the North-Western Provinces. The following gives temperature variation data for these provinces.

DISTRICT.	VARIATION OF		
	Mean maximum temperature from the normal.	Mean minimum temperature from the normal.	Mean temperature from the normal.
	°	°	°
Punjab	+5·0	+1·5	+3·3
Rajputana	+6·5	+3·2	+4·9
Central India	+4·8	+1·5	+3·2
North-Western Provinces .	+5·1	+1·8	+3·5

The excess was greatest at the following stations: Jhansi (5·9°), Jeypore (5·9°), Agra (5·7°), Sambhar (5·5°), and Delhi (5·2°). The area represented by these stations, including East Rajputana and the adjacent districts of the North-Western Provinces, was hence that of most excessive temperature.

The mean temperature of the month was generally in light excess in the Peninsula and in defect in North-

Eastern India and Burma, but the variations were generally small. The following gives data:—

Division.	Variation of		
	Mean maximum temperature from the normal.	Mean minimum temperature from the normal.	Mean temperature from the normal.
	°	°	°
Burma Coast	−0·1	−0·3	−0·2
Burma Inland	−0·1	−2·1	−1·1
Assam	−0·4	+0·2	−0·1
Bengal and Orissa	−0·5	+0·2	−0·2
Deccan	+1·5	+0·7	+1·1
We t Coast	+0·4	+0·4	+0·4
Southern India	+0·6	+0·6	+0·6

The mean temperature of the month was 3° above the normal at Madras and 2·2° at Salem. These stations represented the area in the Madras Presidency in which the drought was most severe during the month.

The air was very much drier than usual, and the amount of cloud abnormally small over the whole of North-Western and Central India. It was slightly drier in Bengal, Burma and the Deccan and damper in Assam. The following table gives the mean variations of the aqueous vapour pressure, humidity and cloud amount from the normal in the meteorological provinces of India:—

Division.	Mean variation of		
	Aqueous vapour pressure from normal.	Humidity from normal.	Cloud amount from normal.
Burma Coast and Bay Islands	−·019	−1	+0·9
Assam	+·014	+1	+0·5
Bengal and Orissa	−·020	−1	+0·7
Gangetic Plain and Chutia-Nagpur	−·032	−6	−0·3
Upper Sub-Himalayas	−·118	−14	−1·8
Indus Valley and N.-W. Rajputana	−·112	−10	0
East Rajputana, Central India and Guzerat	−·012	−9	−0·9
Deccan	+·001	−1	+0·6
West Coast	−·002	−1	+0·1
Southern India	−·013	−3	+0·3

The rainfall of the month was even more unequally distributed than usual. There were two periods of strong influx of humid winds from the Arabian Sea. These were:—

1st.—From the 1st to the 11th. This gave general rain to the West Coast Districts, Deccan, Berar and the Central Provinces, but the rainfall did not extend into Central India and Rajputana, except as very light and partial showers.

2nd.—From the 19th to the 30th. This influx of humid winds gave general rain in the West Coast Districts, the North Deccan and the whole of Central and North-Western India except Sind and the West Punjab.

The Bay current gave daily rain to Arakan, Tenasserim and Lower Burma and the hill districts of Upper Burma. The central districts of Upper Burma, including Mandalay, Myingyan and Shewbo, received averages of less than half an inch during the month, and this area was almost as dry and hot as the West Punjab. There were three periods of strong influx of moist winds across the Bengal coast. These were:—

1st.—From the 1st to the 7th, during which Orissa, Bengal, Behar and Assam obtained moderately heavy general rain.

2nd.—From the 14th to the 18th, when Bengal and Assam received heavy rain and Behar and Chutia-Nagpur moderate rain.

3rd.—From the 24th to the 30th. This influx accompanied the formation and advance of a cyclonic storm. It gave general rain to the Province of Bengal, the North-Western Provinces and South-East Punjab.

The Bay current was more largely diverted to Burma than usual during the month. Lower Burma, Arakan and Tenasserim hence received excessive rain. In Bengal and Assam the rainfall was fairly well distributed throughout the month and was generally slightly below the normal. There was a considerable deficiency in Orissa and the districts of Behar bordering on the North-Western Provinces.

The Bombay current gave on the whole heavier rain than usual to the West Coast Districts, Berar and the Central Provinces. The rainfall was very deficient in parts of Madras.

The rains did not set in fully over North-Western India until nearly the end of the month, and hence there was a very large deficiency over that area which was greatest in the North-Western Provinces and Central India.

The following give comparative rainfall data for the various meteorological provinces:—

Province.	Mean actual rainfall of July 1891.	Mean normal rainfall for July.	Variation from normal.
	Inches.	Inches.	
Burma Coast and Bay Islands	39·60	31·68	+7·92
Burma Inland	7·84	11·39	−3·56
Assam	18·53	14·39	+4·14
Bengal and Orissa	14·05	14·18	−0·29
Gangetic Plain and Chutia-Nagpur.	7·67	11·91	−4·05
Upper Sub-Himalayas	4·59	12·25	−7·66
Indus Valley and North-West Rajputana.	2·20	2·98	−0·78
East Rajputana, Central India and Guzerat.	11·09	11·94	−1·35
Deccan	13·36	12·06	+1·29
West Coast	28·19	31·21	+0·96*
Southern India	5·10	5·91	−0·53

* A reference to Table I will show that the means for the West Coast in columns 2 and 3 are for a smaller number of stations than the mean in the first column. Average rainfalls are not at present available for certain stations.

Atmospheric Pressure.

The distribution of mean 8 A.M. pressure for July 1891 is shown by means of two charts. The first chart (Plate I) gives the distribution of the mean pressure of the month reduced to sea level and to constant gravity (that of latitude 45°) by means of isobars drawn for differences of pressure of ·05″ or $\frac{1}{20}$th of an inch. The second chart (Plate II) gives the variations of the actual mean pressure from the normal pressure. These values are obtained from the barometric readings reduced for temperature only. A small chart No. 4 of Plate III gives the distribution of the monthly mean daily pressure and of the mean winds in the same form and manner as in the monthly charts given hitherto in annual reports on the meteorology of India. The data on which this chart is based are given in Table II. It should be noted that the pressure data in this table are not only reduced to sea level, but also to constant gravity (that of latitude 45°).

The more important barometric changes and movements during the month are fully given in the statement of the barometric depressions of the month. The data that are chiefly used in this discussion are the 8 A.M. reduced observations and the variations derived from a comparison of these observations and the normal daily values, the monthly means of which are utilized in Table I. The means in the third column of that table are not only reduced or corrected to sea-level, but also to constant gravity. The normal means are obtained from the observations of the period 1878—88, and in order that the means and variations may be strictly comparable, the means have been calculated for observations of the same period in all cases.

The mean or normal distribution of pressure in the month of July is very similar to that of June, with the exception that pressure is slightly lower in Upper India, and hence the gradients on the average are slightly steeper than in June. The normal mean pressure of the month ranges from 29·85″ in Ceylon and the south of the Bay to 29·40″ in Upper India, thus giving a mean range of pressure of about ·46.″ Pressure is actually lowest in Upper Sind and the South-West Punjab. The isobars run from WNW to ESE across the Peninsula and from WSW to ENE across the Bay, thus forming curves which are concave northwards, and whose lowest or most southerly points are near to the west coast of the Bay.

Pressure in Northern India is usually lowest along a line running from North Orissa to Mooltan, along the southern edge or limit of the Gangetic plain. It increases rapidly southwards and slightly northwards to the base of the Himalayas. Hence as in June a trough of low pressure runs across Northern India and forms an important feature in the meteorology of the month.

The mean distribution of pressure of the month is shown in two charts, *viz.*, Plate I and Plate III, chart 4. In Plate I is given the mean 8 A.M. pressure of the month, and in Plate III the mean daily pressure. The distribution of pressure in July 1891 differed from the normal in the following respects:—

1st.—The range of pressure over India was slightly greater than usual, exceeding ·46.″

2nd.—Gradients were somewhat steeper than usual over the Peninsula and in the Bay of Bengal.

3rd.—Pressure was more uniform than usual over the whole Gangetic plain from West Bengal to the South-East Punjab.

The differences between the actual and normal pressure for the month are indicated by means of lines in Plate II. This plate shows that pressure was very slightly above the normal in Ceylon and South Madras, and was below it over the rest of India, the deficiency increasing in amount northwards and exceeding ·04″ in the Gangetic plain and the South-East Punjab, in which it ranged between ·04″ and ·06.″

These facts may be stated in a slightly different and more suggestive manner. The mean pressure of the whole of India was ·031″ below the normal. Relatively to this state pressure was in excess (or the pressure anomalies were positive) in the Peninsula, Sind, Kathiawar and West Rajputana. They were absolutely greatest in the south of India and Ceylon at the following stations:—

Colombo	+·046″
Cochin	+·044″
Madura	+·036″

Hence although Western India continued to be characterised by excess pressure, the abnormally high pressure in North Bombay and Kathiawar, which had been a very marked feature of the meteorology of the previous three months, disappeared during the month of July.

The anomalies were negative or pressure was in relative defect in Northern India, Assam and the greater part of Burma. The negative anomalies slightly exceeded ·02″ in two areas, *viz.*, Assam and East and Central Bengal and the East Punjab, and also locally at Patna (—·028″) and Allahabad (—·021″). The following gives the anomalies of the observing stations in these areas:—

—	Station.	Anomaly.
(1) Assam and East and Central Bengal	Sibsagar	—·032″
	Silchar	—·025″
	Dacca	—·023″
	Jessore	—·023″
	Berhampore	—·024″
(2) East Punjab . .	Lahore	—·021″
	Sialkot	—·024″
	Ludhiana	—·036″

The deficiency in Assam and East Bengal had been a persistent feature during the previous six months, and was less prominent in July than hitherto.

Barometric depressions and cyclonic storm of the month.

At the commencement of the month pressure was below the normal, the deficiency being slightly greater in North-East India than in other districts. A very shallow depression lay over Chutia-Nagpur. Pressure fell more or less rapidly on the 1st and steep gradients obtained on the 2nd and 3rd. The depression in Chutia-Nagpur disappeared and the trough of low pressure extended from Central Bengal to the Central Punjab, and hence lay further north than usual. Pressure, after increasing slightly on the 3rd and 4th, fell again rather rapidly on the 5th and 6th in Northern India, and very steep gradients obtained on these days. The effect of these changes was to displace the trough of low pressure to the foot of the hills from Sialkot to Durbhunga. The barometric changes during the next four days were of little importance as they did not appreciably modify the pressure distribution, the chief features of which at this time were:—

1st.—Very steep gradients over the whole of India, more especially in North-Western India.

2nd.—The abnormal position of the area of minimum pressure or south-west monsoon trough of low pressure along the foot of the Himalayas. It may be noted that this displacement of the trough of low pressure is almost invariably associated with an abnormally strong easterly tendency of the Bombay current and the withholding of rain from North-Western India.

These conditions continued until the 10th, on which day pressure was slightly in excess on the Bombay coast and in defect in other districts, the deficiency exceeding two-tenths at the submontane stations from Ludhiana to Dhubri, and being greatest at Gorakhpur (—·217″).

A rapid increase of pressure greatest in amount in Northern India occurred during the next 48 hours. Pressure was lowest in the Punjab on the 12th and 13th, but a shallow local depression covered Orissa, Chutia-Nagpur and the eastern districts.

A rapid fall of the barometer in North-Western India on the 13th again changed the distribution of pressure. On the morning of the 14th pressure was nearly two-tenths below the normal in the West Punjab. The local depression in Chutia-Nagpur had merged into the monsoon low pressure trough which again occupied its normal position. Pressure was more or less below the normal in all districts except Sind, Kathiawar and North Bombay, the increased pressure being most marked at the head of the Gulf of Cambay, and steep gradients prevailed on the 14th and 15th.

Local heavy rain in Bengal on the 15th appears to have been the chief factor which gave rise to the formation of a small shallow depression in Central Bengal on the morning of the 16th. Pressure had increased rapidly in North-Western India during the previous 24 hours whilst it had fallen locally in Bengal. The rise extended to the whole of India during the day, and on the morning of the 18th this shallow depression in Bengal disappeared. Pressure was on that day largely in excess in North-Western and Western India, and was in moderate defect in Burma. The excess was slightly above a tenth of an inch in Sind and Kathiawar and North Bombay. Pressure again decreased rapidly on the 18th and 19th, and a shallow depression appeared in Chutia-Nagpur and the eastern districts of the Central Provinces on the 19th. It moved to the north-eastern districts of the Central Provinces on the morning of the 20th. The barometer fell during the next day in North-West India and rose in other districts, and on the morning of the 22nd pressure was upwards of a tenth of an inch below the normal in the South-East Punjab where it was lowest. The shallow depression in the Central Provinces had merged into the trough of low pressure which was well marked and occupying its normal position.

The preceding remarks have shown that up to this period pressure had oscillated rapidly and that within rather large limits, but that the monsoon had been characterized by an unusual absence of cyclonic storms.

Some of the features which had marked the distribution of pressure for some months previously were as persistent and well marked during the first three weeks of July as hitherto. The more remarkable of these features were excessive pressure in Western India and deficient pressure in North-Eastern India. The excessive pressure in Western India was most strongly exhibited in Kathiawar and Guzerat.

A remarkable change in the pressure distribution occurred during the next week, and was in part at least due to a remarkable cyclonic storm which passed across Northern India from the head of the Bay to the Sind Frontier. The following gives an account of this depression and storm of the rains:—

Cyclonic storm of July 24th to 30th.—It has been pointed out that on the 22nd pressure was considerably below the normal in Upper India. This gave somewhat steeper gradients than usual. In the Arabian Sea a moderate to strongish monsoon was blowing, and the information obtained from ships shows that it increased in force during the next two days, so that on the 24th winds were of force 7 to 9, with a very high sea, between Socotra and Bombay. A similar change apparently occurred during the same period in the Bay of Bengal. On the 22nd winds ranged in direction from SSW to WSW, and in force from 4 to 6, over the whole of the Bay, except the north-east angle where they were comparatively feeble. The S.S. *Rutherford*, *Shahzada*, *Golconda*, *Kohinur*, *Badsworth* and *Nizam*, which left or entered the river Hooghly during the morning of the 22nd, all reported light to moderate variable winds with showery or squally weather. The weather was more squally

on the 23rd, and south-west winds of force ranging from 4 to 6 were recorded by all the vessels in the north-west of the Bay. Thus the S.S. *Fultala* in Lat. 20° 28′ N. and Long. 87° 46′ E. at noon had heavy continuous thick rain, squally weather with moderate south-west winds, and the ship *John Davis* a little further south in Lat. 19° 17′ N., Long. 86° 24′ E. had a moderate south-west gale with frequent squalls and heavy rain.

Pressure increased slightly in North-Eastern India on the 22nd, but the changes did not affect appreciably the distribution of pressure. The monsoon low pressure trough was very clearly marked, and ran from Orissa to the South-West Punjab, terminating in a deepish depression in that area and Upper Sind. The Bombay current was giving heavy rain in the West Coast Districts and moderate rain to the Deccan and Central Provinces. Burma, Bengal and Assam were receiving fairly general and steady rain from the Bay current. The westerly winds in the North Deccan and Central Provinces were more northerly than usual, showing that the Bombay current was diverted from Central and Upper India and was hence blowing across the Peninsula to the head of the Bay, where there was apparently a large amount of interaction between it and the Bay current.

The pressure changes of the next 24 hours were nowhere large in amount. Pressure increased in North-West and Western India and diminished in Bengal, Lower Burma, and the Bay. Rain fell in larger amounts in the West Coast Districts, and extended over the greater part of Central India, Rajputana and the North-Western Provinces. This extension of the rainfall area was evidently due to the increasing strength and volume of the humid current advancing from the sea area across the Bombay Coast. The S.S. *Norna*, *Asia*, *Mirzapore* and others experienced very strong monsoon winds with a very high to a "frightful" sea in the Arabian Sea on this day. In the Bay winds were increasing in force over the whole area, except the extreme south, where moderate west-south-west winds obtained. The following extracts from the logs of the S.S. *Patna* and *Maharaja* show fully the character of the weather in the north-west of the Bay on the 24th :—

Ship.	Hour.	Position at noon.		Wind.		Remarks.
		Lat. N.	Long. E.	Direction.	Force.	
Maharaja	8 A.M.	...	...	SW	3	Cloudy weather.
	Noon.	20° 22′	88° 45′	SW	4	Squally.
	8 P.M.	Course	S 45 E	SW	6 to 7	Strong breeze and very heavy squalls.
Patna	4 A.M.	...	...	SW	5	Heavy squalls at times.
	Noon.	19° 59′	88° 49′	NNW	6	Frequent squalls and high sea.
	8 P.M.	Course NE	...	NW	6	Heavy squalls of rain.

The change of wind shewn by the log of the *Patna* as she approached the mouth of the Hooghly is the first indication given by the observations of the commencement of a cyclonic whirl. This is further confirmed by the S.S. *Arratoon Apcar*, which left Calcutta in the morning and anchored in the afternoon at Diamond Harbour. She had passing north-east squalls with heavy showers of rain during the night. It is hence evident that a small cyclonic storm began to form on the afternoon and evening of the 24th near the mouth of the Hooghly. The barometer fell briskly in South-West Bengal and the north of the Bay during the night of the 24th, and at 8 A.M. of the 25th a well marked depression covered South-West Bengal and the north-west angle of the Bay. The centre of the depression and of the cyclonic circulation which was established was a little to the north of Saugor Island.

The following gives data giving its position at 8 A.M. and 4 P.M. of the 25th :—

Hour.	Station.	Barometer reduced to 32° and sea-level at constant gravity 45°.	Wind direction.
		Inches.	
8 A.M.	Saugor Island	29·352	W. N. W.
	Calcutta	·358	E. N. E.
	Burdwan	·420	E.
	Balasore	·403	W. S. W.
4 P.M.	Saugor Island	·319	S. S. W.
	Calcutta	·337	S. E. by E.
	Burdwan	·358	E.

The shift of wind at Saugor Island and Calcutta between 8 A.M. and 4 P.M. shew that the depression had already commenced to move westwards. Winds were moderate throughout the day at Saugor Island and at Calcutta. For example, the amount recorded at Saugor Island between 10 A.M. and 4 P.M. was only 79 miles, the normal average for the same period of the day in July being 113 miles, and at Calcutta between the same hours, the actual amount was 100 miles. Hence it is evident that the horizontal air movement in the area near the centre was comparatively feeble during the day. The logs of vessels at the head of the Bay shew that the westerly winds in the southerly quadrant had increased very rapidly in force and were now blowing with the force of a gale. The following gives extracts from the logs of two of these vessels :—

Ship.	Hour.	Position at noon.		Wind direction.	Weather.
		Lat. N.	Lon. E.		
S. S. *Etona*	4 A.M.	...	...	S. W.	Brisk gale, heavy rain and heavy sea.
	Noon.	19° 3′	87° 10′	S. W.	Ditto.
	8 P.M.	...	...	S. W.	Brisk gale, very heavy sea and blinding rain.

Ship.	Hour.	Position at noon.	Wind direction.	Weather.
S.S. *Arratoon Apcar.*	8 A.M.	Left Diamond Harbour.	N.	Light breeze, hazy with small rain.
	Noon.	Passing Saugor Island.	S.W.	Light winds and cloudy.
	8 P.M.	...	S.W.	Strong gale with hard squalls and continued heavy rain.

The observations of the *Arratoon Apcar* are very interesting, as they prove conclusively that over the inner central area and to the north of it winds were light, and that it was only in the outer portion of the southern quadrant that strong winds (force 8 and 9) obtained. This, it may be remarked, is a frequent characteristic of the air circulation in these cyclonic storms of the rains.

The depression advanced west by north during the evening and night of the 25th through West Bengal and Chutia-Nagpur, and the centre at 8 A.M. of the 26th was to the west-north-west of Chyebassa. It is not possible to fix its position precisely, but it was probably in about Lat. 22¾° N. and Long. 85¼° E. The following give observations at stations nearest to the centre at that hour :—

Station.	Barometer reduced to 32° and sea-level at constant gravity 45°.	Barometric Variation from normal.	Wind.	
			Direction.	Velocity in miles per hour during past 24 hours.
	Inches.			
Sambalpur	29·338	?	S.W.	8
Chyebassa	·355	—·371″	S.E.	2
Ranchi	·337	—·200″	E.	13
Hazaribagh	·361	—·156″	E.	21

The 4 P.M. observations at Sambalpur and Hazaribagh indicate that the depression continued to advance westwards, but do not enable the position of the centre to be determined with exactness.

The observations taken on board vessels in the Bay shew that strong monsoon winds prevailed over the centre and north of the Bay, and that weather was more or less squally, and winds of force 8 and 9 near the head of the Bay. Thus the *Goalpara*, in Lat. 20° N., had a fresh to strong WSW gale with violent squalls and a high sea, the *Booldana* off the Orissa Coast had a moderate to a fresh gale with high sea and frequent squalls, and the *Arratoon Apcar*, in Lat. 18° 23′ N. and Long. 90° 8′ E., at noon, had a fresh south-west gale with hard squalls and heavy rain.

The barometric changes at this period were almost entirely due to the motion of the depression. Thus, on the 26th, pressure increased rapidly in Bengal and at the head of the Bay, and diminished as rapidly in the Central Provinces and Central India. The depression at 8 A.M. of the 27th had advanced into Baghelkhand and the north-eastern districts of the Central Provinces, the centre being probably in Lat. 23½° N. and Long. 81½° or ¾° E. The following gives observations at stations nearest to the centre at that hour :—

Station.	Barometer reduced to 32° and sea-level at constant gravity Lat. 45°.	Variation from normal.	Wind.	
			Direction.	Velocity miles per hour.
	Inches.			
Allahabad	29·335	—·168″	E.N.E.	16
Sutna	·293	—·222″	N.N.E.	6
Jubbulpore	·291	—·246″	N.	4
Raipur	·395	—·176″	S.S.W.	25

The contrast between the feeble winds at Sutna and Jubbulpore and the strong winds at Allahabad and Raipur is very striking, and shews that the characteristic features of the air movement were the same in the interior as when the depression was forming and crossing the coast of South-West Bengal. Very heavy rain had fallen during the previous 24 hours in the northern districts of the Central Provinces and in the eastern districts of Central India, or in front of the advancing depression.

The following 4 P.M. observations indicate that the centre was nearly midway between Jubbulpore and Sutna :—

Station.	Barometer reduced to 32° and sea-level at constant gravity Lat. 45°.	Wind.	
		Direction.	Velocity in miles per hour.
	Inches.		
Allahabad	29·242	E.S.E.	32
Sutna	·220	S.E.	12
Jubbulpore	·272	W.	3
Raipur	·361	S.S.W.	24

The weather in the north of the Bay improved during the night of the 26th, and on the morning of the 27th winds were less violent than during the previous two days. Squalls were however still of frequent occurrence over the north and north-east of the Bay. The *Goalpara* for example in Lat. 20° N. and Long. 89° E., at 8 A.M., had a hard gale with very high squalls, but the weather moderated rapidly after noon. In the evening the great majority of vessels in the north of the Bay experienced winds force 4 to 6.

The storm continued to drift in a west-north-west direction during the afternoon and night of the 27th, and the centre at 8 A.M. of the 28th was to the south-west of Jhansi in about Lat. 25° N. and Long. 78½° E. The following gives the 8 A.M. observations of pressure and wind at stations nearest to the centre :—

Station.	Barometer reduced to 32° and sea-level at constant gravity Lat. 45°.	Variation from normal.	Wind.	
			Direction.	Velocity in miles per hour.
	Inches.			
Jhansi	29·342	—·156″	S.E.	12
Agra	·409	—·109″	S.E.	13
Jeypore	·402	—·136″	N.E.	6
Neemuch	·393	—·168″	N.N.E.	4
Saugor	·436	—·133″	S.S.W.	8

More or less general and heavy rain had fallen in Berar, the Central Provinces, Central India and Rajputana during the previous 24 hours. The largest falls were recorded in the Bhopal State at Sehore (10·4 inches) and Bhopal (9·2 inches). The heavy rainfall at this time extended as far west as Jodhpore. The 4 P.M. observations do not enable the position of the centre of the storm at that hour to be defined exactly. The chief feature of the weather at this time was the very strong winds blowing across the Bombay Coast, the North Deccan, the Central Provinces and Central India. The monsoon had been blowing strongly across the Bombay Coast for some days past, but it had increased very considerably during the previous 36 hours. The following statement gives the mean air movement of the previous 24 hours and the normal motion in July at four representative stations :—

STATION.	WIND.		
	Direction.	Actual velocity in miles per hour.	Normal velocity in miles per hour.
Bombay	W.	35	19
Ratnagiri	W. S. W.	22	13
Sholapur	S. W.	26	12
Nagpur	S.	25	8

When these averages are compared with the average air motion at the stations nearest to the storm given in the preceding table, it will be seen that the air motion was very strong in the outskirts of the storm, but was comparatively feeble over its inner area, and more especially in the western quadrant.

Fine weather with moderate winds (force 2 to 5) now prevailed over the Bay.

The storm continued to advance in a west-north-west direction during the afternoon and night of the 28th, and was in West Rajputana on the morning of the 29th. The centre was probably in Lat. 26½° N. and Long. 74° E. at 8 A.M. of that day. The following gives pressure and wind observations of the stations nearest to the centre :—

STATION.	Barometer corrected and reduced to 32° and sea-level at constant gravity Lat. 45°.	Variation from normal.	Wind direction.	Velocity in miles per hour.
Mount Abu	...	−·097	N. W.	9
Pachpadra	29·385	?	N.N.W.	4
Ajmere	·363	−·182	S.	8
Bikaneer	?	?	N.	14
Jacobabad	·505	+·066	Calm	6

The depression was less in amount than hitherto, and the storm was hence commencing to fill up.

More or less general rain had fallen in Rajputana during the previous 24 hours, and some showers in Sind. The following large amounts were registered in Western Rajputana at 8 A.M. :—

DATE.	District.	Station.	Amount.
29th	Serohi	Serohi	4·82 inches.
29th	Ajmere	Dewair	3·50 "
29th	Jodhpur	Jaswantpura	5·00 "
30th	Do.	Falodi	7·23 "
30th	Do.	Shergarh	4·00 "

Winds on the West Coast had decreased very rapidly in strength during the previous 24 hours. The following give data for representative stations :—

STATION.	WIND.	
	Direction.	Velocity in miles per hour during 24 hours preceding 8 A.M. of 29th.
Bombay	W. S. W.	23
Ratnagiri	S. W.	18
Sholapur	W. S. W.	21

A moderate increase had occurred in Sind and Cutch. The wind data show conclusively that the indraught from the Bombay Coast was now decreasing rapidly in intensity. The depression filled up very rapidly during the night of the 29th, and on the morning of the 30th it was an ill-defined and shallow depression extending over Upper Sind and Western Rajputana, and it is not possible to define the position of the centre. The following gives pressure and wind observations at stations in the central area:—

STATION.	Barometer reduced to 32° and sea-level at constant gravity Lat. 45°.	Change since 8 A.M. previous day.	Variation from normal.	WIND.	
				Direction.	Velocity in miles per hour during past 24 hours.
	Inches.				
Ajmere	29·496	+·133"	−·062"	S. W.	7
Mooltan	·521	0	+·064"	N. E.	2
Jacobabad	·499	−·006"	+·059"	Calm	5
Deesa	·506	+·121"	−·003"	N. N. W.	21

The depression filled up completely during the night of the 30th, and no trace of its existence was shown by the observations of the 31st.

The previous storm was in its leading features a typical example of the cyclonic storms of the rains. It formed in the usual manner in South-West Bengal and the north-west angle of the Bay during a period of local heavy rainfall, and advanced in an almost straight W. by N. course across Northern India into Upper Sind along a line or track approximately coincident with the position of the axis (or a little to the south of it) of the trough of low pressure.

The following gives the position of the centre at different dates and its rate of advance during its existence :—

Date.	Position of Storm Centre.		Distance travelled in past 24 hours.	Rate of motion per hour.
	Lat. North.	Long. East.		
24th 8 A.M.	22	88	...	Storm in process of formation.
25th 8 A.M.	22	88	...	
26th 8 A.M.	22¾	85¼	·200	8 miles.
27th 8 A.M.	23½	81¾	·200	8 miles.
27th 4 P.M.	23¾	80¾	...	
28th 8 A.M.	25	78½	·260	11 miles.
29th 8 A.M.	26½	74	·250	10 miles.
30th 8 A.M.	28	70	·250	

The wind observations show most clearly that in the earlier stages (from the 24th to the 27th) the storm was maintained almost entirely by indraught from the Bay of Bengal. On the 27th, when the indraught from the Bay of Bengal was rapidly diminishing in amount, indraught from the Arabian Sea was initiated and intensified rapidly during the next 24 hours. The storm was hence fed by the moist current from the Arabian Sea on the 28th and 29th, and as it filled up, this current decreased *pari passu* in strength.

The pressure changes from the 24th to the 29th were almost entirely dependent upon the movement of the cyclonic storm. On the 29th pressure began to give way rapidly in the north of the Bay, Burma and North-Eastern India. The fall continued with increasing rapidity on the 30th, and on the morning of the 31st a shallow depression covered the north of the Bay. The history of this depression and storm is given in the August Review.

Brief summary of weather in the Arabian Sea and Bay of Bengal.

The following brief summary is drawn up from the extracts taken from the logs of vessels entering the ports of Bombay and Calcutta :

(*a*) *Arabian Sea.*—At the commencement of the month strong south-west monsoon winds were blowing over the centre of the Arabian Sea or between Socotra and Bombay. Winds were not so strong in the south, and so far as can be judged from the few available observations, did not exceed 6 in force. In the central area between Socotra and Bombay they were of force 6 to 9 and were frequently interrupted by fierce squalls. For example, the S.S. *King Arthur* in Lat. 17° 8′ N. and Long. 64° 11′ E. on the 2nd had very bad weather with violent squalls and a mountainous sea. The S. S. *Vulcan* in Lat. 15° 21′ N. and Long. 56° 22′ E. at noon of the 5th had heavy squalls and a fearful high cross sea, and the S. S. *Colaba* in Lat. 15° 50′ N. and Long. 74° E. had hard squalls and a tremendous sea.

This weather continued with apparently little or no change until the 11th or 12th, when the weather moderated slightly. From the 14th to the 18th vessels experienced winds of force 6 to 9 in this central belt of the Arabian Sea, and hence a strong and steady monsoon blew over the Arabian Sea from the beginning of the month until the 18th.

Winds decreased further in strength during the next three days, and varied in strength from 4 to 6 in the central belt between Socotra and Bombay. Further south, light to moderate south-west winds obtained. Winds began to increase again slowly in force on the 22nd. The *Norna* on the 24th had south-west winds of force 9 and a frightful sea in Lat. 15°49′ N. and Long. 57°34′ E. The S. S. *Alderney* in the same position on the 25th had south-west winds, force 8 and 9, and a high sea. The S.S. *Knight Companion*, which left Bombay on the 26th, had westerly winds of force 9. Weather became much worse during the next 48 hours in the central belt of the Arabian Sea. The *Knight Companion* had terrific squalls and a tremendous sea on the 27th ; the *Norna* in Lat. 17° 42′ N. and Long. 68° 35′ E. had south-west winds, force 9, and a "very high, terrible mountainous sea." This weather continued on the 28th and 29th, when the winds began to take off in strength. At the end of the month the monsoon in the Arabian Sea was probably slightly above its normal strength; winds of force 4 to 7 prevailed over the south and centre, and weather was squally with a high sea.

(*b*) *Bay of Bengal.*—At the commencement of the month winds were approximately normal in direction over the Bay, except that they were more westerly than usual near the Arakan Coast.

Light to moderate winds, force 2 to 4, prevailed to the south of Lat. 12° N., and moderate to strong winds (force 4 to 6) with slightly disturbed or squally weather obtained between the parallels of 12° and 20° N. Lat. Winds were moderate and below their normal strength near the head of the Bay to the north of Lat. 20° N.

The weather became more squally with stronger winds in the centre of the Bay on the 2nd. The *Nerbudda* in Lat. 15° 34′ N. and Long. 86° 2′ E. at noon of that day had a strong gale with frequent squalls, and the *Byculla* off the Arakan Coast experienced frequent squalls and a very high sea. Winds also increased in force at the head of the Bay. On the 5th strong squally south-west winds, varying in force from 6 to 8, prevailed over the Bay to the north of Lat. 12° N. Weather improved to the south of Lat. 15° N. on the 7th, but a strong monsoon with heavy squalls obtained to the north of that parallel. The S.S. *Kistna* experienced a strong gale and terrific sea off the Arakan Coast, and the S.S. *Megna*, proceeding to sea from the Hooghly, had a moderate to strong south-west gale with high sea. No change of importance occurred in the Bay during the next four days. Weather was squally over the north and centre of the Bay with strong south-west winds and high sea, the squalls

being most severe and frequent off the Arakan Coast. On the 12th winds began to decrease in force at the head of the Bay, and weather was fine with moderate winds (force 4 to 5) over the whole of the Bay, except near the Burma Coast, where it was still somewhat squally. On the 17th weather became squally with very heavy rain at the head of the Bay, and this squally weather extended over the whole of the north and north-east of the Bay to the north of Lat. 15° N. on the 18th, 19th and 20th. On the 21st and 22nd winds fell off in strength very considerably at the head of the Bay, and were only of force 2 to 3 on the 22nd. During this period strong monsoon winds continued to blow over the whole of the centre of the Bay. Winds, however, again began to increase in force over the whole of the north and centre of the Bay, whilst steady south-west to west-south-west winds, force 4 to 6, held in the south of the Bay. The weather became unsettled with heavy continuous rain and frequent squalls on the 23rd at the head of the Bay and also off the Arakan Coast. Winds increased rapidly in strength at the head of the Bay on the 24th, and on the morning of the 25th it was blowing a fresh to a strong gale (force 7 to 9) with frequent severe squalls and a very high sea over the north-west of the Bay. The weather began to improve on the afternoon of the 27th, and on the morning of the 28th moderate to strongish south-west winds, force 4 to 6, prevailed over the whole of the north and centre of the Bay, and weather was fine with slight to moderate sea over the centre and south-east of the Bay. Winds became lighter on the 29th in the north of the Bay, and were light and unsteady. On the 30th two vessels reported north-west winds, and one of these (the S.S. *Goa*) also noted the occurrence of very heavy rain in Lat. 19° N. and Long. 90° 30′ E. At the same time weather gradually became very squally with strong monsoon winds off the Burma Coast and in the south-east of the Bay. On the 31st a shallow depression covered the north of the Bay. Weather was fine and clear to the west and north-west, but was already stormy in the south-east of the depression, which lay between the parallels of 17° N. and the Bengal Coast The S.S. *Goa*, which was in Lat. 16° 36′ N. and Long. 93°6′ E. at noon, and proceeding south-east, had a fresh breeze and rising sea in the morning, and in the afternoon a strong south-west gale with a very high cross sea, and the S.S. *Pentakota* in Lat. 16° 25′ N. and Long. 93° 9′ E. at noon had a strong south-west gale with very heavy squalls and a heavy sea.

Summary of special Storm Reports.

Local storms are usually of less frequent occurrence in July than in the months of April, May and June. Dust-storms, in some cases accompanied with rain, are of occasional occurrence in the drier regions of North-Western India, *i. e.*, Sind, Cutch, and the Western States of Rajputana, and also in Beluchistan. Rain-squalls are a frequent feature of the cyclonic storms which are generated at the head of the Bay and pass westwards across Northern India and are sometimes of great severity. The following gives a brief statement of the local storms in July 1891, of which reports were sent in by observers:—

1st. Dust-storm at Lahore from 0-40 A.M. to 1-10 A.M.

3rd. Dust-storm at Lahore from 5-5 P.M. to 5-35 P.M.

4th. Dust-storms at Ludhiana (3-30 P.M. to 5 P.M.) and Hyderabad (9-10 A.M. to noon). Average velocity of wind during the storm at Hyderabad was 60 miles per hour.

5th. Dust-storm with rain at Cawnpur (noon to 0-20 P.M.) and at Allahabad (from 2-40 P.M. to 4 P.M.) Dust-storm and gale of wind at Hyderabad from 9 A.M. to 0-30 P.M. Average velocity of wind 63 miles per hour during storm.

6th. Dust-storms at Sirsa (6-30 A.M. to 7-45 A.M., and again at 6-30 P.M. to 7-45 P.M.), at Ludhiana (2-45 P.M.), Bhuj (4 P.M. to 6 P.M.), and Hyderabad (3 P.M.). The dust-storm at Hyderabad is described as appearing at a distance as "a large mass consisting of a number of large vertical columns of dust revolving and advancing onwards."

8th. Dust-storm at Hyderabad. Winds blew from south to west during the storm. Average wind movement during storm 57 miles per hour.

Dust-storms at Bhuj (4 P.M.) and Allahabad (3-45 P.M.) Greatest velocity of the wind during the dust-storm at Allahabad was 36 miles per hour.

9th. Violent dust-storm at Hyderabad from 2 P.M. to 6 P.M. Average velocity of wind (which ranged in direction between N. W. and S. during the gale) was 62 miles per hour. The cloud movement changed from S.E. through E. to N.E. thus shewing that it was a cyclonic whirl.

10th. Dust-storm from west at Hyderabad. Average wind velocity during the storm was 50 miles per hour. The cloud movement changed from S.E. through E. to N.W.

11th. Dust-storm and gale of wind at Bhuj. Average velocity of wind 40 miles per hour from 11 A.M. to 4 P.M.

15th. Violent dust-storm at Hyderabad in Sind. It commenced at 4-10 P.M., and lasted till 8-15 P.M. The average wind velocity previous to 4 P.M. was 20 miles per hour, and from 4 P.M. to 8 P.M. it averaged 42 miles per hour. The storm was very

severe on the Indus, and was described by the boatmen as a "black storm."

16th. Violent dust-storm at Jacobabad (10-15 P.M. to 11-3 P.M.). The storm came down from north-west.

19th. Westerly gales with very heavy rain at Chikalda and Akola in Berar. Greatest velocity of wind at Chikalda 33 miles per hour, and at Akola 34 miles per hour.

24th. Dust-storm at Hyderabad (7-30 P.M. to 7-50 P.M.) followed by a gale of wind from the west.

26th. Tornado (of very small extent) at Diamond Island. The following is the observer's account of it:—

At 0-30 P.M. the wind varied from south to south-east, and this was followed immediately by a heavy shower of rain. At 1 P.M. it fell a dead calm. A peculiar subdued light lighted up the east from the horizon to the zenith, whilst the west was dark and black with heavy banks of clouds. At 1-30 P.M. the vane became agitated, the wind varying rapidly between south-west and north-west. Suddenly an awful sound of rushing whirling wind was heard, thundering through the forest, uprooting and dismembering large trees and whirling the branches in the air like chaff. It struck the Pilot house and out-houses at the south point of the island, damaging the former and unroofing the latter, carrying the zinc sheets to a distance of 100 yards. The storm or whirl expended itself about 150 yards from shore. It was of great violence, though not of great magnitude, being about 50 feet in diameter.

26th. Severe thunder-storm at Pedong in Sikkim from 4-20 P.M. to 6-20 P.M., and again from 7-35 P.M. to 9 P.M.: 0·80 inch of rain fell during the first storm, and 2·22 inches during the second storm.

28th. Dust-storm at Hyderabad in Sind (3-40 P.M.), and dust-storm with rain at the same station (6-39 P.M to 6-51 P.M.): 0·51 inch of rain fell in the twelve minutes during which the second storm lasted.

Temperature of the Air.

The distribution of temperature in India for July 1891 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 data by means of which these charts have been prepared are given in Table I. The normal mean maximum and minimum temperatures have been obtained for each station from the observations of the same number of years, *viz.*, 1878 to 1888. 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 amounts, which vary from month to month. But the variation of the mean daily temperature from the normal as determined by the use of this definition agrees in almost all cases very closely with the variation as determined by the use of true daily means based on readings at 16 hours, in addition to those 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.

The temperature conditions in July are determined by the amount and distribution of the rainfall. In July 1891 the rainfall was considerably below the normal over the greater part of Northern, North-Western and Central India. The chief periods of most general rainfall were from the 1st to the 7th, from the 13th to the 17th in North-Eastern and Western India and the Deccan, and from the 20th to the 31st, in the Central Provinces and Western India, and from the 24th to the 31st in Northern and Central India. During the first two periods rain fell chiefly in North-Eastern India. Hence hot-weather conditions in a slightly modified form obtained during the first three weeks of the month over the whole of North-Western and Central India. The variations of the temperature from the normal were comparatively small in the areas of normal and excessive rain, whilst in the areas where the rainfall was small in amount and much below the normal, the day and night temperatures were largely in excess and by nearly equal amounts.

The mean maximum or day temperature was slightly below the normal mean of the month in Bengal, Orissa, Assam and Burma, and also in the Bombay Coast districts, Mysore, Madras, and the West Deccan districts (Bellary and Dharwar). The deficiency nowhere exceeded 2°, and was less than 1° except at one or two stations in Bengal and Assam. The mean maximum temperature was in excess over the remainder of India. The excess was greater than 4° over the whole of the North-Western

Provinces, the Punjab, Rajputana and Central India. It was greatest in the central portion of that area, defined by the following stations, in which the excess was more than 7° in amount:—

STATION.	Variation of mean maximum from normal.
Jeypur	+7·9°
Agra	+7·8°
Allahabad	+7·7°
Jhansi	+7·5°

The day temperature was almost as largely in excess at the hill stations of Northern India as at the neighbouring plain stations. Hence in virtue of the strong convection currents prevailing during the day in Upper India throughout nearly the whole of the month, the whole atmosphere, up to an elevation of certainly 10,000 feet, was almost equally raised above the normal temperature.

The mean minimum or night temperature was slightly in defect in Lower Burma, Central Bengal, and the Indus Valley. It was considerably below the normal at Quetta (—4·7°) and Peshawar (—2·1°). The low night temperature at these stations was apparently a residual effect of the excessive snowfall in Central Asia during the preceding winter. The mean night temperature was in excess in other districts. The excess was less than 2° over the greater part of the area of increased night temperature, but was above 2° in the North-Western Provinces, Rajputana and the South-East Punjab. It exceeded 3° at the following stations:—

STATION.	Variation of mean minimum from normal.
Sambhar	+4·2°
Jhansi	+4·2°
Jeypur	+3·0°
Delhi	+3·9°
Agra	+3·6°
Ajmere	+3·5°
Sirsa	+3·5°
Ludhiana	+3·4°

The night temperature was as much above the normal at the hill stations in Northern India as at the adjacent plain stations.

The mean temperature of the month was below the normal in Lower Burma, Bengal (except the south-eastern districts), North Behar, Orissa, Ganjam, Mysore, and a small portion of South Madras, represented by the stations of Coimbatore and Madura. The deficiency was less than 1° at all stations in these areas, except Dhubri (—1·5°) and Purneah (—1·4°). It was more or less in excess over the remainder of India. The excess averaged 2° or upwards over nearly the whole of the North-Western Provinces, Central India, Rajputana and the Punjab, and was more than 5° in amount over the area defined by the following stations (*viz.*, East Rajputana and the adjacent districts of the South-East Punjab and the North-Western Provinces):—

STATION.	Variation of mean temperature from normal.
Jeypur	+5·9°
Jhansi	+5·9°
Agra	+5·7°
Sambhar	+5·5°
Delhi	+5·2°

At the commencement of the month the south-west monsoon was fully established in the West Coast Districts and in Burma and Bengal, and had extended into the interior. Rain was falling in the Central Provinces and eastern districts of the North-Western Provinces, but over the greater part of North-Western India dry weather with clear or lightly clouded skies obtained. Hence temperature was more or less above the average over the greater part of the country. The following give temperature variation data of the 1st for the larger provinces:—

PROVINCE.	VARIATION OF		
	Mean maximum from normal.	Mean minimum from normal.	Mean temperature from normal.
Burma	−0·6	−0·6	−0·6
Bengal and Assam	−1·5	+0·3	−0·6
North-Western Provinces and Oudh	+1·6	+1·4	+1·5
Punjab	+4·1	+2·9	+3·5
Rajputana and Sind	+3·3	+2·0	+2·7
Central India and Guzerat	+4·8	+0·9	+2·9
Central Provinces and Berar	+6·6	+2·2	+4·4
Bombay	—0·3	—0·6	—0·5
Madras	+2·5	—1·5	+0·5

Temperature decreased in the Central Provinces and Central India, and increased in the Punjab and North-Western Provinces during the next three days, and on the 4th the mean temperature of the day was from 10° to 12° above the normal at Ludhiana, Delhi and Agra. The temperature changes were rather large and rapid during the next four days, but temperature was steadily above the average in North-Western and Central India during this period. The following give the temperature variations of the 7th, a day which fairly represents the temperature conditions of this period:—

PROVINCE.	VARIATION OF		
	Mean maximum from normal.	Mean minimum from normal.	Mean temperature from normal.
Burma	+0·1	+1·2	+0·7
Bengal and Assam	2·5	−0·6	−1·6
North-Western Provinces and Oudh	+7·8	+1·3	+4·6
Punjab	+5·3	—1·0	+2·2
Rajputana and Sind	+4·0	+3·3	+3·7
Central India and Guzerat	+2·2	—0·8	+0·7
Central Provinces and Berar	—2·7	0	—1·4
Bombay	+0·8	+1·5	+1·2
Madras	+1·5	+0·9	+1·2

Little rain fell during the next four days from the 8th to the 13th, except in Burma, Assam, Bengal, and the West Coast Districts. Hence temperature increased rapidly in Upper and Central India during this period, and was very largely above the normal. The 11th was a very hot day in the North-Western Provinces and South-East Punjab, the mean temperature of the day being from 10° to 15° above the normal in that area. The following table gives the temperature variations of the 12th, which was almost as hot as the 11th over the whole of North-Western India :—

PROVINCE.	VARIATION OF		
	Mean maximum from normal.	Mean minimum from normal.	Mean temperature from normal.
	°	°	°
Burma	+ 0·7	−0·9	−0·1
Bengal and Assam	+ 0·3	−0·8	−0·3
North-Western Provinces and Oudh	+11·2	+5·0	+8·1
Punjab	+11·5	+2·8	+7·2
Rajputana and Sind	+ 7·0	+2·1	+4·6
Central India and Guzerat	+10·5	+3·4	+7·0
Central Provinces and Berar	+ 8·6	+4·6	+6·6
Bombay	+ 5·4	+2·5	+4·0
Madras	+ 1·1	+0·9	+1·0

On the 13th fairly general rain commenced in Berar and the Central Provinces, and extended to Central India and the western districts of the North-Western Provinces. This caused a large reduction in these districts, but temperature continued more or less excessive in the Punjab and Rajputana. It was also at this time excessive in the Central and South Deccan, in consequence of the scanty rainfall in that area. The following table gives the variations of the 15th :—

PROVINCE.	VARIATION OF		
	Mean maximum from normal.	Mean minimum from normal.	Mean temperature from normal.
	°	°	°
Burma	0	−0·4	−0·2
Bengal and Assam	+ 0·4	+0·8	+0·6
North-Western Provinces and Oudh	+ 2·4	+0·3	+1·4
Punjab	+10·7	+5·8	+8·3
Bombay	+ 3·6	+1·5	+2·6
Central Provinces and Berar	0	+0·1	+0·1
Central India and Guzerat	+ 6·0	+2·0	+4·0
Rajputana and Sind	+ 5·4	+2·0	+3·7
Madras	+ 5·3	+2·0	+3·7

The westerly winds began to increase in force on the West Coast, and rain to fall in larger amounts in the Peninsula from the 17th, and this reduced temperature considerably in the Deccan. Temperature continued to be largely above the normal in the Punjab, Rajputana and North-Western Provinces, but the area of greatest excess of temperature was now transferred to Rajputana and the South-East Punjab. The 20th, 21st and 22nd were very hot days in the whole of North-Western and Central India. On the 22nd the mean temperature of the day was over 15° in excess at Jeypur (16·5°), Sambhar (15·7°), and Sirsa (15·2°). The following table gives temperature data for that day :—

PROVINCE.	VARIATION OF		
	Mean maximum from normal.	Mean minimum from normal.	Mean temperature from normal.
	°	°	°
Burma	−0·1	−0·6	− 0·4
Bengal and Assam	+1·5	+1·0	+ 1·3
North-Western Provinces and Oudh	+8·9	+4·1	+ 6·5
Punjab	+15·9	+5·7	+10·8
Rajputana and Sind	+13·0	+5·8	+ 9·4
Central India and Guzerat	+9·0	+3·4	+ 6·2
Central Provinces and Berar	+1·4	+1·5	+ 1·5
Bombay	−0·6	+0·1	− 0·3
Madras	−0·2	−0·9	− 0·6

A cyclonic storm now began to form in the north-west of the Bay. This drifted during the period from the 24th to the 30th in a west by north course across Northern India into Upper Sind, and carried humid winds and heavy rainfall to Central India, Rajputana, the North-Western Provinces, and a large portion of the Punjab. Hence temperature was reduced by the rainfall below the normal over nearly the whole of India. The following gives temperature data for the 29th, which should be compared with the corresponding data of the 22nd given above :—

PROVINCE.	VARIATION OF		
	Mean maximum from normal.	Mean minimum from normal.	Mean temperature from normal.
	°	°	°
Burma	−0·7	−1·0	−0·9
Bengal and Assam	−1·1	+0·2	−0·5
North-Western Provinces and Oudh	−9·1	−3·9	−6·5
Punjab	+0·2	−1·5	−0·7
Rajputana and Sind	+4·6	+0·9	+2·8
Central India and Guzerat	−2·1	−1·7	−1·9
Central Provinces and Berar	−2·0	−1·2	−1·6
Bombay	−2·1	−0·4	−1·3
Madras	−0·2	+0·8	+0·3

Rainfall diminished in amount during the last two days of the month, and temperature increased to some extent in North-Western India, but did not differ much from the normal in any part of India, except in South and Central Madras, where it was from 2° to 4° above the normal. The following gives temperature data for the last day of the month—

PROVINCE.	VARIATION OF		
	Mean maximum from normal.	Mean minimum from normal.	Mean temperature from normal.
	°	°	°
Burma	+1·2	+0·3	+0·8
Bengal and Assam	0	+0·2	+0·1
North-Western Provinces and Oudh	+1·9	+0·6	+1·3
Punjab	−1·1	+1·3	+0·1
Rajputana and Sind	−1·2	+0·1	−0·6
Central India and Guzerat	−2·0	+0·4	−0·8
Central Provinces and Berar	+0·6	−0·1	+0·3
Bombay	−0·3	+0·9	+0·3
Madras	+3·6	+1·8	+2·7

Winds.

The mean wind direction at 8 A.M. during the month of July 1891 is shown in Plate I by arrows flying with the wind. It is obtained by the use of Lambert's formula, in which equal value is given to every wind point. The data are given in Table I. The mean wind directions derived from the wind observations at 10 A.M. and 4 P.M. are given in the small chart No. IV of Plate III, by means of arrows flying with the wind. The data for these will be found in Table II, together with the normal directions obtained from the observations of the past 10 to 20 years.

The south-west monsoon currents usually prevail over the whole of India in the month of July. Strong westerly winds blow across the Bombay Coast and the Deccan, and south-westerly winds in Rajputana and Central India. South-westerly winds obtain in the Bay, and are continued up the Irrawaddy Valley in Burma as southerly winds and up the Gangetic Valley as easterly winds. Winds are usually very light and unsteady in Upper India and Sind, and in the adjacent districts. They give a feeble cyclonic circulation over that area, the area of minimum pressure during the month.

Winds at Port Blair and in Lower Burma and Arakan in July 1891 were considerably stronger than the normal, thus shewing that the monsoon current in that part of the Bay was above its normal strength. The same was also the case at the stations at the head of the Bay, but to a less extent. Thus the average amount of wind was nearly 25 per cent. above the normal in Lower Burma, whilst in Lower Bengal it was barely 7 per cent. Hence a stronger current than usual blew up the Bay. One of the remarkable features of the air motion in the Bay was the unusually large westing in the winds over the east of the Bay. The logs of vessels in this part of the Bay show that abnormal westerly winds were of frequent occurrence off the Arakan Coast. This abnormal westing is shewn very clearly by the mean wind directions of the month at Port Blair and the Burma stations. It is sufficient to give three examples :—

STATION.	Mean wind direction of July 1891.	Normal wind direction of July.
Port Blair	S. 59°W.	S. 44°W.
Rangoon	S. 57°W.	S. 29°W.
Akyab	S. 3°W.	S. 4°E.

Winds were even steadier than usual in Burma.

Winds were on the average of the month normal in South and East Bengal as represented by Saugor Island and Dacca. In Chutia-Nagpur and West Bengal westerly winds (the extension of winds blowing across the Central Provinces) were of abnormal frequency, and the usual easterly element in the mean wind direction of the month was hence replaced by a westerly component, *e.g.*—

STATION.	Mean wind direction of July 1891.	Normal wind direction of July.	Average percentage.	Normal percentage.
Calcutta	S. 4°W.	S. 11°E.	40	65
Burdwan	S. 3°W.	S. 26°E.	51	47
Hazaribagh . . .	S. 46°W.	S. 16°E.	14	19

South-easterly to easterly winds obtained very steadily during the month in the North-Western Provinces, and blew more strongly than usual. The mean wind velocity of the month in that province was 50 per cent. above the normal.

In the East and South-East Punjab winds were very light and also very irregular and unsteady. Thus the percentage of steadiness at Lahore was only 13, the normal being 34. They were practically normal in the North and West Punjab.

Winds were normal in strength at the Bombay Coast stations. In the Deccan the westerly winds of the month were unusually strong. At Belgaum they were 15 per cent. and at Sholapur 41 per cent. above their normal intensity. The same was the case in Berar, the Central Provinces and West Rajputana. In the Central Provinces they were on the average of all stations nearly 30 per cent. above the normal force, in Berar 27 per cent. above, and at Deesa in Western Rajputana 15 per cent. above. Hence follows the somewhat remarkable fact that, although the Bombay monsoon current was blowing across the Bombay Coast with its normal force, it was much stronger over the whole of the interior in which it usually prevails in July, *viz.*, the Deccan, Berar, Central Provinces and Rajputana and probably Central India.

The variations of the mean wind directions of the month were small in Bombay, the Deccan, Berar, and the Central Provinces. On the whole winds were a little more directly from the west than usual. At Deesa the mean direction was N. 38° W., the normal being S. 40° W., thus showing the abnormal extension of dry north-westerly winds across Western Rajputana during the month. In East Rajputana winds were more directly from the west, and had less southing than usual, *e.g.*—

STATION.	WIND.			
	DIRECTION.		STEADINESS.	
	Mean wind direction, July 1891.	Normal wind direction, July.	Percentage, July 1891.	Normal percentage, July.
Jeypore	N. 71°W.	N. 51°W.	47	25
Ajmere	S. 84°W.	S. 62°W.	63	64
Deesa	N. 38°W.	S. 40°W.	74	75

Humidity and Cloud.

The hygrometric data for 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 the minimum of the 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 *Vade-Mecum*, which are 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 5 to 20 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 5 to 25 years of the available cloud data for the same hours.

The south-west monsoon conditions of great humidity were established in Bombay, the Deccan, Berar, the Central Provinces, Bengal, Assam, Chutia-Nagpur and Behar during the preceding month. A slight increase of humidity occurred in the beginning of July over North-Western India, including the North-Western Provinces, Central India, Rajputana and the Punjab, but it was not until the fourth week of the month that the large and rapid increase which immediately precedes the general commencement of the rainfall of the south-west monsoon in North-Western India took place.

The following gives a few examples of the rapid increase of humidity in this area which preceded and accompanied the passage of the cyclonic storm of the last week of the month across Central India and Rajputana and the extension of humid monsoon currents over the whole of North-Western India.

The following gives data in illustration :—

Date.	Actual humidity at 8 A.M. of date.			
	Ajmere	Agra.	Ludhiana.	Murree.
21st	55	50	50	35
22nd	57	57	58	43
23rd	76	80	67	76
24th	91	76	70	79
25th	89	91	98	82

The variations of the aqueous vapour pressure and of the humidity from the normal were small in amount in those districts which received fairly general rain throughout the month. The aqueous vapour pressure was slightly below the normal in Burma, Orissa, Bengal, Behar, and was normal in Chutia-Nagpur and slightly in excess in Assam. It was slightly in defect in Bombay, but was above the normal by small amounts in the Central Provinces, except the more eastern districts. There was a very large deficiency over the whole of North-Western India in which the first general rain did not occur until the fourth week of the month. The deficiency increased in amount north-westwards to the Indus Valley, Central Punjab and Beluchistan. The following table gives data for representative stations in this dry area during the month :—

District.	Station.	Aqueous vapour. Variation from normal.	Humidity. Variation from normal.
North-Western Provinces	Allahabad	−·064	−14
	Agra	−·097	−15
Rajputana	Jeypore	−·120	−20
	Deesa	−·020	−13
Punjab	Ludhiana	−·116	−16
	Lahore	−·220	−13
	Peshawar	−·174	−12
Sind	Jacobabad	−·119	−11
Beluchistan	Quetta	−·156	−13

and the following table gives average data for the different provinces in the dry area :—

Province.	Variation of	
	Aqueous vapour from normal.	Humidity from normal.
	″	%
North-Western Provinces	−·064	−12
Rajputana	−·051	−13
Punjab	−·169	−14
Sind	−·073	−7
Beluchistan	−·150	−13

The deficiency in the humidity, it may be noted, was even more marked at the hill stations in Upper India than at the adjacent plain stations, but this was in part due to the excessive temperature at these stations. Thus at Murree the humidity was 27 in defect, at Chamba 17, and at Simla 18. This feature did not extend to Ladakh, as the humidity there was 1 above the normal of the month.

The following gives the lowest humidities at 4 P.M. recorded during the month at the stations named :—

Station.	Date.	Lowest humidity in July 1891.
Quetta	3rd	8
Kailang	4th	8
Peshawar	6th & 9th	11
Jacobabad	7th	7
Ludhiana	10th	16
Lahore	10th	8
Simla	10th	20
Roorkee	10th	15
Meerut	10th	19
Lucknow	10th	20
Debra	10th	14
Murree	14th	14
Chamba	14th	11

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 offices of the Meteorological Reporter, Director of Land Records, or other officer 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 July 1891 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.

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 160 meteorological stations. The distribution of rainfall is shewn on this chart by means of isohyetic lines, or lines of equal amounts of rainfall, the numbers attached to each line indicating the rainfall.

The line of no rainfall is indicated by two parallel lines separated by a short distance, one continuous and the other dotted, the latter facing the districts of no rainfall.

The second chart illustrating the distribution of the rainfall of the month is given in Plate V, and shows by figures the variation of the mean actual rainfall of the month from the normal rainfall in each of the 51 meteorological districts into which India and Burma have been divided for purposes of comparing crops and rainfall. The data of this chart are deduced from the rainfall information telegraphed by district officers, of which a summary is given in the following table, and the actual figures utilized are those given in the last column. The numbers given in the centre of each district are the variations of the actual mean rainfall of the district from the normal mean rainfall; a number given in a corner of each district in small slanting figures serves as an index by means of which, on referring to the list of districts at the foot of the chart, the name of the district can be at once ascertained.

Province.	Division.	Average actual rainfall of Division, 1st to 4th July 1891.	Average actual rainfall of Division, 5th to 11th July 1891.	Average actual rainfall of Division, 12th to 18th July 1891.	Average actual rainfall of Division, 19th to 25th July 1891.	Averege actual rainfall of Division, 26th to 31st July 1891.	Total rainfall during the month.	Normal average rainfall during the month.	Variation from normal.
		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Burma	Tenasserim	7·08	15·13	15·73	18·62	8·31	64·87	47·73	+ 17·14
	Lower Burma	2·39	7·61	7·31	10·00	3·68	30·99	23·12	+ 7·87
	Central do.	2·46	6·42	4·37	5·16	2·81	21·22	19·90	+ 1·32
	Upper do.	0·41	1·37	1·15	1·18	1·18	5·29	?	?
	Arakan	5·81	24·58	10·65	10·63	13·19	64·86	48·37	+ 16·49
Bengal and Assam	Eastern Bengal	1·46	9·10	2·82	1·49	3·84	18·71	18·91	— 0·20
	Assam (Surma)	3·05	15·46	5·17	2·98	3·70	30·36	29·78	+ 0·58
	Do. (Brahmaputra)	1·98	5·05	2·49	3·04	1·79	14·35	14·65	— 0·30
	Deltaic Bengal	1·21	3·17	2·38	1·60	2·65	11·01	12·26	— 1·25
	Central do.	1·69	2·62	2·52	1·02	3·03	10·88	11·93	— 1·05
	North do.	2·76	8·40	4·00	2·51	1·94	19·61	20·09	— 0·48
	Orissa	0·66	0·97	1·42	3·69	1·30	8·04	12·83	— 4·79
	Chutia-Nagpur	1·47	2·44	3·06	1·97	2·19	11·13	13·93	— 2·80
	Behar (South)	1·93	1·82	1·70	0·74	1·83	8·02	11·91	— 3·89
	Do. (North)	2·03	3·41	2·03	0·75	2·06	10·28	11·71	— 1·43
North-Western Provinces and Oudh.	North-Western Provinces (East)	0·56	0·60	0·75	0·85	0·81	3·57	12·04	— 8·47
	Oudh (South)	0·12	0·28	0·88	1·64	0·65	3·57	10·71	— 7·14
	Do. (North)	1·01	0·10	1·09	0·92	0·66	3·78	11·32	— 7·54
	North-Western Provinces (Central)	0·09	0·66	0·42	2·34	1·22	4·73	11·23	— 6·50
	Do. do. (West)	0·30	0·53	0·53	1·52	1·04	3·92	10·19	— 6·27
	Do. do. (Sub-montane)	0·93	0·39	1·47	2·82	1·67	7·28	13·71	— 6·43
Punjab	Punjab (South)	0	0·35	0·17	0·34	2·04	2·90	4·28	— 1·38
	Do. (Central)	0·04	0·23	0·07	1·37	1·67	3·38	6·78	— 3·40
	Do. (Sub-montane)	0·11	0·05	0·18	1·71	2·25	4·30	9·04	— 4·74
	Do. (Hill Districts)	0·23	0·35	1·56	3·86	4·25	10·25	23·15	— 12·90
	Do. (North-West)	0·03	0·02	0·27	0·64	2·11	3·07	5·57	— 2·50
	Do. (West)	0·02	0·03	0·39	0·27	0·56	1·27	2·43	— 1·16
Bombay and Malabar Coast Districts (Madras).	Malabar	5·10	3·49	2·41	8·60	6·00	25·60	26·68	— 1·08
	Madras (South Central)	1·54	1·65	0·31	2·88	1·38	7·76	2·92	+ 4·84
	Coorg	6·02	12·52	1·70	15·15	5·73	41·12	24·90	+ 16·22
	Mysore	0·70	0·67	0·18	1·77	1·07	4·39	4·78	— 0·39
	Konkan	7·75	6·65	4·01	16·17	9·85	44·43	40·67	+ 3·76
	Bombay Deccan	0·84	1·72	0·30	3·47	3·35	9·68	6·92	+ 2·76
	Hyderabad (North)	?	?	?	?	?	?	?	?
	Khandeish	0·80	0·96	0·75	3·46	1·83	7·80	4·82	+ 2·98

Province.	Division.	Average actual rainfall of Divison, 1st to 4th July 1891.	Average actual rainfall of Division, 5th to 11th July 1891.	Average actual rainfall of Division, 12th to 18th July 1891.	Average actual rainfall of Division, 19th to 25th July 1891.	Average actual rainfall of Division, 26th to 31st July 1891.	Total rainfall during the month.	Normal average rainfall during the month.	Variation from normal.
		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Central Provinces and Berar.	Berar	1·03	1·40	2·00	5·64	1·27	11·34	9·12	+ 2·22
	Central Provinces (West)	1·48	1·92	2·47	7·42	3·78	17·07	12·53	+ 4·54
	Do. (Central)	1·23	2·44	3·97	4·88	5·93	18·45	18·31	+ 0·14
	Do. (East)	1·38	1·91	4·78	2·95	7·05	18·07	15·44	+ 2·63
Bombay (North)	Guzerat	0·75	1·33	0·60	4·20	11·59	18·47	17·23	+ 1·24
	Kathiawar	0·24	1·78	0	2·11	6·00	10·13	8·53	+ 1·60
	Sind	0	0	0·19	0	0·38	0·57	2·17	— 1·60
Rajputana and Central India.	Central India (East)	0·57	0·99	0·81	2·92	2·55	7·84	12·33	— 4·49
	Rajputana (East) Central India (West)	0·26	0·40	0·19	2·10	3·19	6·14	9·27	— 3·13
	Rajputana (West)	0	1·80	0·02	0·52	3·50	5·84	4·23	+ 1·61
Madras	East Coast (North)	0·87	0·68	0·90	1·40	0·43	4·28	5·36	— 1·08
	Do. (do.) (a)	0·60	2·40	2·00	2·45	3·73	11·18	?	?
	Hyderabad (South)	0·57	0·16	0·54	1·17	0·24	2·68	4·92	— 2·24
	Madras (Central)	0·15	0·28	0·38	0·58	0·09	1·48	3·30	— 1·82
	East Coast (Central)	0·43	0·30	0·73	1·74	0·16	3·36	3·65	— 0·29
	East Coast (South)	0·30	0·02	0·09	0·06	0·26	0·73	2·66	— 1·93
	Madras (South)	0·07	0	0·06	0·05	0·02	0·20	1·17	— 0·97

The general distribution of the actual rainfall of July 1891 is shown in chart IV.

The following gives the most important points of difference between the actual distribution and the normal distribution :—

(1) Excessive rainfall in the Burma coast districts and very deficient rain in the central districts of Upper Burma.

(2) Very deficient rainfall in the Gangetic plain west of Patna.

(3). Excessive rainfall in the central districts of the Central Provinces, Seoni being the centre of heaviest rainfall.

(4) Very deficient rainfall in the Deccan, more especially the central districts from Sholapur to Bellary.

The following gives a statement of the more important features of the rainfall of the month throughout India, and is compiled so far as possible from the monthly rainfall statements published by the Provincial Governments.

The Bay current was more strongly directed to Burma than usual. This was shown by the unusual preponderance of westerly winds off the Arakan coast, as well as by the excessive rain in the whole of Lower Burma, and more especially in the coast districts. In Arakan, Tenasserim and Lower Burma, it rained very steadily throughout the month, and at many stations rain fell in larger or smaller quantities on every day of the month. Rainfalls exceeding 5 inches were recorded at nearly all stations in these areas at least once during the month. This heavy rainfall however extended inland only as far as the Prome district. In the districts of Thayetmyo, Pyinmana and Yemethin, and the whole of Upper Burma (with the exception of the Ruby Mines District), the rainfall was very partial and irregularly distributed, and was also small in amount. In several districts the total rainfall of the month was less than an inch in amount. The following gives data for these districts :—

District.	Station.	Amount.	District.	Station.	Amount.
		Inch.			Inch.
Meiktila	Meiktila	0·44	Lower Chindwin.	Monywa	0·40
	Mahlaing	0·12			
			Kyaukse	Kyaukse	0·28
Pakokku	Pakokku	0·48	Sagaing	Sagaing	0·60
Myingyan	Myingyan	0·48	Mandalay	Mandalay	0·56
	Pagan	0·19		Amarapura	0·78

This dry area hence included the central districts of Upper Burma. In that area the rainfall of the month averaged less than half an inch, and the number of rainy days was less than two. It was hence quite as dry as the western districts of the Punjab.

The rainfall in Burma during the month ranged from 91·38 inches at Sandoway to 0·12 inch at Mahlaing.

The following table gives rainfall data for Burma :—

District.	Total rainfall in July 1891.	Normal rainfall for July	Variation from normal.
	Inches.	Inches.	Inches.
Tenasserim	64·87	47·73	+ 17·14
Lower Burma	30·99	23·12	+ 7·87
Central Burma	21·22	19·90	+ 1·32
Upper Burma	5·29	?	?
Arakan	64·86	48·37	+ 16·49

The monsoon current in the Bay of Bengal was on the whole slightly stronger than usual in July. Southerly humid winds blew fairly steadily during the month across the Bengal coast, and hence Bengal and Assam received rain steadily throughout the month. The chief periods of rainfall were as follows :—

1st.—From the 3rd to the 6th. This influx of moisture was due to ordinary monsoon conditions. It gave a burst

of rain to the whole Province of Bengal, including Behar and Chutia-Nagpur. The most remarkable feature about it was the excessive rainfall it gave to a small portion of East Bengal, whilst the current was temporarily falling off in strength. This feature is shown very fully by the following returns which give the rainfalls of 5 inches or upwards in 24 hours which occurred during this influx:—

DIVISION.	District.	Station.	Haviest rainfall in July 1891.	Date.
			Inches.	
SOUTHWEST BENGAL.	Hooghly	Jehanabad	5·80	5th
	Burdwan	Culna	5·20	6th
EAST BENGAL	Chittagong	Cox's Bazar	8·26	8th
		Chittagong	6·32	10th
		Kutubdea	8·90	8th
		Satkanya	9·25	6th
		Ditto	8·44	7th
		Ditto	14·63	8th
	Chittagong Hill Tracts.	Rangamati	6·00	6th
		Bandarban	10·44	6th
		Ditto	7·90	7th
		Ditto	8·85	8th
		Ditto	9·33	9th
		Ditto	8·03	10th
NORTH BENGAL.	Dinajpur	Raigunj	5·20	3rd
	Rungpore	Bhawanigunge (Gyabanda).	7·26	7th
		Rungpore	5·33	7th
		Bagdogra (Nilphamari).	5·15	8th
	Julpaiguri	Falacotta	5·55	2nd
	Cooch Behar	Dinhatta	6·24	8th
		Cooch Behar	6·50	8th
NORTH BEHAR.	Purneah	Kissengunge	9·12	2nd
	North Bhagalpore.	Protabganj	5·15	2nd
CHUTIA-NAGPUR.	Singbhoom	Baharagura	6·35	4th

Bandarban in the Chittagong Hill Tracts received 44·55 inches and Satkanya in Chittagong district 40·48 inches from the 6th to the 10th.

An almost complete break in the rains obtained in Behar from the 8th to the 14th. Light to moderate showers were received in Bengal, Orissa and Chutia-Nagpur during the period.

2nd.—The second strong influx of humid winds extended from the 14th to the 18th. East and North Bengal obtained the largest amounts from this influx. The following rainfalls exceeding 5 inches were registered in Bengal during this period:—

DISTRICT.	Station.	Heaviest rainfall.	Date.
		Inches.	
Julpaiguri	Alipore Doar	7·70	15th
	Debiganj	7·13	
Cooch Behar	Cooch Behar	5·16	
	Matabanga	5·07	
Noakholly	Fenny	6·20	16th
	Harishpore	8·65	
Singbhoom	Chakradharpore	9·46	
Manbhoom	Jhalda	5·30	17th
Beerbhoom	Murarai	5·13	18th

This burst was followed by a brief period of light to moderate rain in Orissa and Bengal and of dry weather in Behar and Chutia-Nagpur, which lasted until the 23rd.

3rd.—The third period of rainfall was from the 23rd to the end of the month. The influx of humid winds in this case accompanied the advance of a cyclonic storm which formed at the head of the Bay and drifted slowly westwards across Northern India. The rainfall during this influx was heaviest in the coast districts of East Bengal, in South-West Bengal, Orissa and Chutia-Nagpur. The following amounts exceeding five inches were registered during this burst:—

DISTRICT.	Station.	Heaviest rainfall.	Date.
		Inches.	
Khoolna	Nakipur	5·70	27th
Chittagong	Cox's Bazar	7·32	
Chittagong	Kutubdea	8·41	28th
	Satkanya	5·20	
	Chittagong	5·02	
Mymensingh	Sherpur	11·02	29th

The following statement gives comparative rainfall data of the Province for the month, extracted from the Bengal Weather Report for the month:—

DIVISION.	JULY 1891.			RAINY DAYS.		
	Average.	Normal average.	Variation.	Average number in month.	Normal average number in month.	Variation.
	Inches.	Inches.	Inches.			
Orissa	9·29	12·50	—3·21	12·00	14·02	—2·92
South-West Bengal.	11·22	12·00	—0·78	15·89	16·55	—0·66
East Bengal	16·52	16·60	—0·08	17·52	18·77	—1·25
North Bengal	16·45	14·08	+2·37	16·44	15·57	+0·87
North Behar	10·23	12·34	—2·11	13·25	13·73	—0·48
South Behar	10·30	12·03	—1·73	13·13	15·33	—2·20
Chutia-Nagpur	12·74	13·16	—0·42	15·73	18·51	—2·78

Assam received almost daily rain throughout the month. The period of heaviest rainfall during the month was from the 5th to the 9th. During this period Cherra Poonjee received 38·80 inches. The rainfall of the month was generally in excess by small amounts both in Sylhet and the Brahmaputra valley, but was considerably below the normal in the Garo, Khasi and Jaintia Hills. Cherra Poonjee, for example, only received 74·65 or 41·79 inches less than the normal amount 116·44 inches.

The chief periods of rainfall in the North-Western Provinces were: 1st, from the 3rd to the 7th; 2nd, from the 12th to the 18th; and 3rd, from the 22nd to the end of the month. The first two periods were periods of occasional showers, and not of general rainfall. During these two periods the eastern districts and sub-montane districts obtained light

to moderate rainfall. In the central and western districts the rainfall was light and sporadic, and some districts, as for example Muttra, Aligarh, Bulandshahr, Meerut, Shahjehanpore, Budaun, Muzaffarnagar and Saharanpur, received average total rainfalls of less than three or four tenths of an inch during the whole of the first three weeks of the month.

The first and heavy general rainfall of the south-west monsoon began in the North-Western Provinces on the 21st and 22nd in the hill districts of Kumaon and Gurhwal, on the 23rd in the south-eastern districts of Banda, Fatehpur, Hamirpur, on the 23rd and 24th over the eastern, central and north-western districts, and on the 25th in the western districts of Agra, Aligarh, Muttra, Meerut and Bulandshahr.

This rainfall was due in its earlier stages to an inflow of humid winds from the Arabian Sea, and in the last few days of the month to easterly winds from the Bay of Bengal which formed part of the indraught to the important cyclonic storm of the fourth week of the month. As the North-Western Provinces were outside of the cyclonic storm, the rainfall of the last four days of the month was moderate in amount. The western and central districts which benefited chiefly by the inflow from the Arabian Sea received rather heavy rainfall during this period, whilst the north-eastern and eastern districts obtained light to moderate rain. Gorakhpur, Jaunpur, Benares, Ghazipur, Fyzabad, Gonda, and Bahraich received amounts averaging less than an inch during the last ten days of the month.

Some heavy rainfalls in 24 hours were received in the western districts during this period, of which the following were the most noteworthy :—

District.	Station.	Heaviest rainfall.	Date.
		Inches.	
Moradabad	Thakurdwara	7·80	24th
Bareilly	Baheri	6·17	22nd
Dehra Dun	Ambari	8·60	24th
Tarai	Rudarpore	8·74	24th
	Satarganj	7·00	22nd

The following gives a brief summary of the rainfall data of the North-Western Provinces :—

Province.	Total rainfall in July 1891.	Average rainfall for July.	Variation from normal.
	Inches.	Inches.	Inches.
Oudh (North)	4·24	11·69	—7·45
Oudh (South)	3·92	10·81	—6·89
N. W. P. (North-East)	4·97	12·51	—7·54
N. W. P. (South-East)	3·33	11·84	—8·51
N. W. P. (Central)	4·72	11·68	—6·96
N. W. P. (West)	3·54	9·02	—6·38
N. W. P. (Sub-Montane)	8·21	14·33	—6·12

The preceding data shew that the rainfall was very seriously in defect over the whole province, and that the deficiency was greatest in amount in Oudh and the eastern districts of the North-Western Provinces which received barely one-third of the normal amount. The deficiency decreased in relative amount north-westwards, and was least in the sub-montane districts of Bijnor and Dehra Dun and in the Hill Districts.

The drought was most pronounced in the districts of Lucknow, Unao and Gonda in Oudh, and in Azamgarh, Ghazipur, Benares, and Jaunpur in the North-Western Provinces.

As is frequently the case during a weak monsoon, the distribution of the rainfall was very irregular; one or more heavy downpours occurring at one station in a district, whilst neighbouring stations received little or no rain. The following give a few examples of this irregularity in July 1891 :—

District.	Station.	Total rainfall in July 1891.	Normal rainfall for July.	Variation from normal.
		Inches.	Inches.	Inches.
Basti	Basti	0·80	13·10	—12·30
	Khalilabad	9·30	11·81	— 2·51
Partabgarh	Palti	0·81	9·09	— 8·28
	Kunda	4·70	10·11	— 5·41
Muttra	Mahaban	0·40	8·06	— 8·26
	Shahabad	2·60	8·59	— 5·99
Shaharanpur	Naiashahr	10·50	16·46	— 5·96
	Jarauda	2·20	8·08	— 5·88
Bareilly	Faridpur	4·40	15·16	—10·76
	Baheri	22·55	16·08	+ 6·47

The eastern and central districts of the Punjab received some local showers from the 5th to 8th, and again from the 15th to the 18th. General rain was received from the 23rd or 24th to the 30th in the eastern districts. The northern and central districts also obtained moderate rain during this period, chiefly on the 26th and 27th. The rainfall of the month was more or less in defect throughout the Province. The deficiency was on the whole least pronounced in the Hill Districts, and in the Umballa, Amritsar, Lahore, Rohtak and Hissar Districts, or in the Punjab South. The following table giving variation data shows the general character of the rainfall distribution :—

District.		Total rainfall, July 1891.	Normal rainfall, July.	Variation from normal.
		Inches.	Inches.	Inches.
Punjab	South	2·94	4·28	— 1·38
	Central	3·38	6·78	— 3·40
	Sub-montane	4·30	9·04	— 4·74
	Hill Districts	1·25	23·15	—12·90
	North-West	3·07	5·57	— 2·50
	West	1·27	2·43	— 1·16

The deficiency in the South Punjab averaged nearly 40 per cent., in the Central Punjab 50 per cent., in the Sub-montane Districts 53 per cent., in the Hill Districts 56 per cent., and in the north-west and west districts about 46 per cent. Hence the Province received barely half its normal amount. The rains commenced on the same days as in the North-Western Provinces, whilst on the average they commence about a week or ten days later. The drought was hence less injurious agriculturally in the Punjab than in the North-Western Provinces.

Rajputana received light local showers during the first week of the month. Dry weather set in again on the 8th and continued until the 23rd, from which date until the end of the month moderate rain was received. The rainfall of this period was, on the whole, heaviest in the eastern districts, and heavy rainfalls were received in Jodhpur on the 29th and 30th, of which the most noteworthy were 7·23 inches at Falodi on the 29th, and 5 inches at Jaswantpura on the 28th. The rainfall of the month was hence generally in excess in the western districts, but was more or less in defect in the eastern states, the deficiency being most marked in the states bordering the North-Western Provinces.

Average data are available for very few stations in Rajputana. The following return for representative stations in the eastern states will shew the extent of the deficiency :—

STATE.	STATION.	RAINFALL.		
		Actual of month.	Average of month.	Deficiency.
		Inches.	Inches.	Inches.
Ulwar	Ulwar	4·64	10·26	−5·62
Jeypore	Jeypore	6·46	9·33	−2·87
Bharutpur	Bharutpur	3·59	8·88	−5·29
Kerowli	Kerowli	4·34	11·58	−7·24
Ajmere	Ajmere	3·77	6·91	−3·14

In Central India rain fell chiefly during two periods, from the 1st to the 7th and from the 17th to the 29th. The rainfall of the month was very irregularly distributed and was generally in defect so far as can be judged from the average data available for comparison. The rainfall was in moderate excess in Bhopal and Rutlam, and was in defect in the remaining states, more especially in Bundelkhand, Rewah, Nagode and Gwalior, where the deficiency averaged about 40 per cent.

In the Central Provinces and Berar the rainfall was above the normal and favourably distributed. Moderate showers were received during the first week of the month ; a partial break followed from the 8th to the 12th. Moderately heavy general rain was received over the whole of the Central Provinces on the 13th and 14th, and light showers on the 15th, 16th and 17th. The winds intensified, and stormy weather with heavy rain prevailed over the Province during the next 48 hours. Falls of 2 inches and upwards occurred at 20 stations out of the 62 registering stations on the 19th. This heavy rainfall was almost coincident with the increase in the winds blowing across the Bombay Coast which set in on the 18th. Moderate rain fell from the 20th to the 23rd. The passage of the cyclonic storm of the fourth week of the month through the north-eastern districts of the Province caused a large increase in the indraught from the Arabian Sea, and these intensified humid winds gave heavy rain over the whole Province on the 25th, 26th and 27th, and moderately heavy rain during the remainder of the month.

The north-eastern districts shared in the cyclonic rainfall due to the storm. The following gives the more noteworthy cyclonic downpours :—

DISTRICT.	STATION.	Heaviest rainfall, July 1891.	Date.
		Inches.	
Sambalpur	Sambalpur	6·53	26th
	Raigarh	7·00	"
	Sarangarh	7·50	"
Bilaspur	Mungeli	8·75	27th
	Korba	5·05	"
Balaghat	Behir	8·30	"
Seoni	Seoni	8·71	"
	Lakhnadon	5·91	"
Saugor	Kurai	5·20	28th

Comparative rainfall data for the Province are given in the following table :—

DISTRICT.	Total rainfall in July 1891.	Normal rainfall for July.	Variation from normal.
	Inches.	Inches.	Inches.
Central Provinces, West	17·07	12·53	+4·54
Central Provinces, Central	18·45	18·31	+0·14
Central Provinces, East	18·07	15·44	+2·63
Berar	11·34	9·12	+2·22

The data shew that the rainfall was in moderate excess over the whole of this area. The excess was greatest in the Seoni, Chhindwara, Wardha and Nagpur Districts. The Seoni District received an average of 28 inches, the normal being 17 inches, Chhindwara of 21 inches, the normal being 11 inches, Wardha of 21 inches, the normal being 12½ inches, and Nagpur of 18 inches, the normal being 13·2 inches.

The July monthly rainfall statement for the Bombay Presidency has not yet been received.

The rainfall was below the normal during the first fortnight of the month over the whole Presidency. The rainfall increased considerably in amount in the third week of the month, and was heavy during the remainder of the month over the whole Province except Sind. The following average data shows the general character of the rainfall of the month in different parts of the Presidency.

Meteorological Divisions.	Actual average rainfall of month.	Normal average rainfall of month.	Variation from normal.
	Inches.	Inches.	Inches.
Konkan and Ghâts	51·70	65·52	+13·82
Bombay Deccan	6·29	7·38	+1·09
Berar and Khandesh	10·51	12·84	+2·33
Guzerat	12·37	8·97	−3·40

Hyderabad received frequent showers during the month. The rainfall of the month was generally in defect by small

amounts. The only districts in which the deficiency was large relatively to the normal were Raichur, Beeder, and to a less extent Mehduck and Hyderabad. The following gives comparative data for the first two districts :—

DISTRICT.	STATION.	Total rainfall of month.	Normal rainfall of month.	Variation from normal.
		Inches.	Inches.	Inches.
East Raichur	Raichur	1·17	4·02	—2·85
West Raichur	Lingsagar	0·70	2·60	—1·90
Beeder	Beeder	3·19	9·29	—6·10

There was a moderate local excess in the districts of Aurangabad and Sirper Tandur.

The month was one of partial drought over the greater part of Mysore. The periods of most general rainfall was from the 2nd to the 5th, from the 20th to 23rd, and from the 27th to 29th. The rainfall of the month was excessive at stations in and near the West Ghâts, but over the remainder of the state it was more or less in defect.

The following gives data for stations near the West Ghâts showing that the western districts of Mysore shared heavy rainfall in common with the West Ghâts and coast districts of Travancore and Malabar :—

DISTRICT.	STATION.	Total rainfall of month.	Normal rainfall of month.	Variation from normal.
		Inches.	Inches.	Inches.
Shimoga	Nagar	89·99	72·59	+17·40
	Tirthahalli	47·25	43·38	+ 3·87
Kadur	Koppa	47·55	43·24	+ 4·31
	Mudgere	46·01	29·58	+16·43
Hussan	Manjarabad	39·25	28·40	+10·85

Average data for the central and eastern districts in which there was a considerable deficiency are given in the following table :—

DISTRICT.	Actual average rainfall of month.	Normal average rainfall of month.	Variation from normal.	Average total number of rainy days of month.	Normal total number of rainy days of month.
	Inches.	Inches.	Inches.		
Bangalore	2·03	3·00	—0·97	5·7	5·8
Tumkur	1·12	2·47	—1·35	3·4	5·4
Mysore	1·86	1·83	+0·03	6·4	5·3
Chitaldroog	1·61	2·11	—0·50	7·0	6·8

The rainfall of the month was hence most largely (relatively to the normal) in defect in Tumkur.

In the east coast districts of Madras north of Nellore rain fell in moderate amounts almost daily throughout the month, and gave total amounts differing little from the normal. The chief periods of most general and heaviest rainfall were from the 11th to the 12th, the 16th to the 19th and the 23rd to the 27th.

The Malabar coast districts and the Nilgiris received steady daily rain throughout the month. The precipitation more specially in Malabar was considerably above the average. Thus Tellichery received 40·09 inches during the month, the normal fall being 34·37, and Vayitri 78·90 inches, its normal fall being 50·19 inches.

Over the remainder of the Madras Presidency, the rainfall of the month was very small in amount and considerably below the average. Considerable portions of the districts of Trichinopoly, Madura, Tinnevelly, Coimbatore and South Arcot received no rain at all during the month. The following gives district averages for the month obtained from the complete data of the monthly statement of rainfall published by the Madras Government :—

	DISTRICT.	RAINFALL.			NUMBER OF RAINY DAYS.	
		Actual average of month.	Normal average of month.	Variation from normal.	Actual average of month.	Normal average of month.
		Inches.	Inches.	Inches		
East coast, North	Ganjam	4·89	7·04	—2·15	8·5	10·0
	Vizagapatam	6·78	8·66	—1·88	12·3	12·6
	Godavari	5·87	6·11	—0·24	8·5	8·8
	Kistna	5·08	5·29	—0·21	9·8	8·4
East coast, Central	Nellore	1·65	2·45	—0·80	5·1	4·9
	Chingleput	0·80	3·71	—2·91	3·1	6·3
East coast, South	North Arcot	0·92	3·09	—2·17	2·9	5·2
	South Arcot	0·44	4·43	—3·99	1·4	5·0
	Tanjore	0·80	2·54	—1·74	1·9	3·9
	Trichinopoly	0·26	2·35	—2·09	0·7	2·9
Madras, South Central.	Madura	0·29	0·87	—0·58	0·7	2·4
	Tinnevelly	0·24	6·69	—0·45	0·9	1·6
	Coimbatore	0·60	1·64	—1·04	2·1	3·3
	Salem	1·08	2·97	—1·89	3·0	4·5
Madras, Central	Cuddapah	1·62	2·95	—1·26	3·7	5·5
	Anantapur	1·59	2·32	—0·73	3·4	4·9
	Bellary	1·15	2·62	—1·47	4·6	6·4
	Kurnool	2·40	4·72	—2·32	4·3	7·8

The preceding data hence show that the month was one of drought over a large portion of the Madras Presidency, and that the drought was most severe in the Coimbatore, South Arcot and Trichinopoly Districts.

Explanation of Tables.

Table I gives an abstract of the meteorological observations at 8 A.M. daily, taken at 159 stations in India during the month of July 1891.

In this table the observing stations are grouped under two sets of divisions. According to the first arrangement India and Burma are divided into eleven large meteorological areas or provinces. These divisions have been selected in consultation with the Medical Department. The

climatic conditions of each area are fairly uniform, and they hence are presumed to form suitable areas for the discussion of the relations between disease and meteorology. The names of these divisions are printed in bold type, and the mean variations of the more important meteorological data, more especially temperature, are given opposite to each in prominent figures.

Each of these larger divisions is sub-divided into smaller meteorological areas or districts, of which there are 51 in all. This sub-division was made in consultation with the Revenue and Financial Departments. In each of these smaller areas the distribution and character of the rainfall are fairly uniform, and the staple crops in each are hence the same. This sub-division will, it is hoped, enable a more exact comparison to be made between crops and rainfall than has been hitherto possible.

The headings of the columns in the great majority of cases explain themselves. The figures in the third column "variation from normal" are obtained by taking in each case the difference between the mean actual barometer (reduced for temperature, but not to sea-level or constant gravity) and the normal means obtained from the observations of the eleven years' period 1878—88.

The "mean daily temperature" is assumed in Table I to be the mean of the maximum and minimum. It is chiefly utilized in order to obtain the mean variation of the temperature of the month from the normal.

In obtaining the figures for the column headed "number of rainy days," a rainy day is assumed to be one on which a fall of a tenth of an inch or upwards has been recorded. A fall of less than a tenth of an inch is practically of no value for agricultural purposes in India, and it has not been found possible to secure the accurate record of rainfalls of less than a tenth of an inch at a great majority of the rainfall recording stations.

Table II gives an abstract of the observations recorded at 10 A.M. and 4 P.M. at 89 second class observatories throughout India, Burma, and the adjacent regions. This Table is intended in part to supplement Table I, and hence information given in full in the latter Table, as, for example, rainfall, is not included in Table II. This Table is intended to give for the month, so far as is possible, all the information furnished hitherto in Appendix A of the Annual Report on the Meteorology of India. The methods of calculating the means have been very fully explained in the annual reports, to which the reader is referred for complete information. The data of the mean daily pressure, the figures of which are given in the sixth column, are the means of the 10 and 16 hours' observations, with corrections obtained from a comparison of the 10 and 16 hours' observations of the same or a neighbouring observatory, with a series of hourly observations at the same observatory.

The mean temperature is calculated by the formula mean $= \frac{\text{maximum} + 16 \text{ hours} + 2 \text{ minimum}}{4}$ by applying a constant correction for each month, derived from the hourly observations of the same or of a neighbouring station.

The mean daily vapour tension and humidity are the averages of the values for 10 A.M., 4 P.M., and the minimum readings and the mean daily cloud is the average of the mean amounts for 10 and 16 hours.

The mean wind directions for each month are the trigonometrical resultant of the winds given under each of the eight cardinal points, and are calculated by means of Lambert's formula, in which an equal weight or value is given to every wind.

It should be noted that in the preceding discussion, in speaking of the maximum, minimum, or mean temperature, the total amount of wind or the rainfall of a given day, as for example, the 5th, the maximum, etc., of the 24 hours preceding 8 A.M. of the 5th is meant. This definition has been adopted to avoid confusion. As the observations are taken at 8 A.M., a part of them refer to 8 A.M. of that day and a part to the previous 24 hours, and, therefore, including a portion of the previous civil day. It is found most convenient to use the same date to designate and define both classes of observations.

Table

Abstract of Observations taken at 8 A.M., at 159 Stations

Meteorological Province or District	Station.	Height of Station in feet.	Pressure, 8 A.M., in inches. 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.	Temperature of Air. 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.
Burma Coast and Bay Islands.		...	...	—·035	.	...	...	...	..	...	...	84·1	-0·1	74·9	-0·3	79·5	—0·1	9·2	...	...	...	...	17·
Bay Islands	Port Blair	61·16	29·760	?	29·752	29·856	28th	29·665	11th	·191	81·9	85·6	?	79·3	?	82·4	?	6·3	88·9	13th	75·7	17th	13·2
Tenasserim	Mergui	96·27	29·752	?	29·779	29·836	28th	29·675	14th & 15th	·161	78·0	83·6	?	69·8	?	76·7	?	13·8	89·6	18th	66·5	1st, 2nd & 30th.	23·1
	Tavoy	26·26	29·840	?	29·800	29·913	28th	29·775	15th	·138	77·6	81·8	?	74·2	?	78·0	?	7·6	87·2	8th	71·7	24th	15·5
	Moulmein	93·79	29·700	—·022	29·733	29·809	28th	29·622	15th	·187	76·7	82·2	-0·4	74·3	+0·5	78·3	+0·1	7·9	89·5	22nd	71·8	10th	7·7
	Toungoo	181·1	29·557	—·037	29·682	29·685	28th	29·436	31st	·249	77·7	86·6	+0·3	74·8	—0·1	80·7	+0·1	11·8	90·7	14th, 30th & 31st.	72·7	20th	18·0
Lower Burma	Rangoon	40·69	29·732	—·029	29·711	29·848	28th	29·602	31st	·246	77·8	?	?	75·0	—0·7	?	?	?	?	?	72·9	10th	?
	Bassein	21	29·733	—·028	29·692	29·865	28th	29·589	31st	·276	78·3	84·3	—0·4	75·1	—0·6	79·8	—0·5	9·2	88·7	7th	72·4	11th	16·3
	Diamond Island	41	29·720	—·046	29·698	29·869	28th	29·578	31st	·291	80·8	84·5	0	72·4	—2·8	78·5	—1·4	12·1	87·9	17th	68·6	10th	19·3
Arakan	Akyab	20·44	29·649	—·048	29·614	29·815	28th	29·535	10th	·280	79·9	84·4	—0·1	79·3	+2·0	81·8	+1·0	5·1	89·2	26th	76·6	18th	12·6
Burma, Inland		...	...	—·039	...		...	...	...	...	...	91·6	—0·1	76·0	—2·1	83·9	—1·1	15·6	...	...		...	24·2
Central Burma	Thayetmyo	134	29·573	—·039	29·650	29·694	28th	29·463	10th	·231	80·1	88·7	—0·1	74·1	—2·1	81·4	—1·1	14·6	96·7	3rd	72·9	6 days	23·8
Upper Burma	Mandalay	?	29·438	?	?	29·607	25th	29·316	9th	·291	84·6	97·2	?	78·8*	?	88·4*	?	18·4	103·0	3rd	74·0	18th	29·0
	Kindat	?	29·283	?	?	29·378	12th	29·195	15th	·183	81·9	90·3	?	75·8	?	83·1	?	14·5	94·8	4 days	74·0	9th	20·8
	Bhamo	?	29·241	?	?	29·373	28th	29·122	9th	·251	79·8	90·2	?	75·4	?	82·8	?	14·8	96·6	19th	73·6	11th	23·0
Assam		...	...	—·055	...	...	...	...	...	...	...	89·2	—0·4	78·2	+0·2	83·7	—0·1	11·0	...	...	...	...	19·6
Assam (Surma)	Silchar	104·3	29·506	—·056	29·561	29·677	28th	29·387	9th	·290	81·3	91·0	+0·8	77·8	+0·6	84·4	+0·7	13·2	96·6	20th	75·3	23rd	21·3
Brahmaputra	Sibsagar	333	29·274	—·063	29·558	29·383	28th	29·138	9th	·245	82·6	90·9	—0·1	78·8	+0·8	84·9	+0·4	12·1	96·6	27th	75·5	4th	21·1
	Dhubri	115·34	29·461	—·045	29·529	29·625	28th	29·258	6th	·367	79·6	85·7	—2·0	77·9	—0·9	81·8	—1·5	7·8	90·7	20th	74·3	8th	16·4
Bengal and Orissa		...	...	—·047	...	...	...	...	...	...		87·5	—0·5	77·7	+0·2	82·6	-0·2	9·8	.	...	...	...	18·3
East Bengal	Chittagong	86·7	29·531	—·051	29·565	29·717	28th	29·420	10th	·297	80·7	85·6	+0·1	76·9	+0·5	81·3	+0·3	8·7	89·7	4th & 20th.	74·1	27th	15·6
	Lungleh	?	?	?	?	?	?	?	?	?	70·0	71·2	?	54·9	?	63·1	?	16·3	76·9	3rd	51·5	1st	25·4
	Noakholly	42·73	29·555	?	29·545	29·712	28th	29·433	10th	·279	81·1	85·1	?	77·9	?	81·5	?	7·2	89·0	20th	74·8	27th	14·2
	Comillah	34·75	29·563	?	29·546	29·742	28th	29·443	10th	·299	81·0	87·0	?	76·7	?	81·9	?	10·3	91·3	20th	66·8	23rd	24·5
	Serajgunj	46·37	29·516	?	29·511	29·669	28th	29·378	6th	·291	81·3	87·8	?	78·7	?	83·3	?	9·1	91·1	19th	74·7	29th	16·4
	Dacca	21·7	29·548	—·054	29·518	29·721	28th	29·419	10th	·302	81·7	87·3	—1·2	79·4	+0·1	83·3	—0·6	7·9	91·1	20th	76·7	28th	14·4
	Burrisal	12	29·559	—·042	29·516	29·722	28th	29·434	10th	·288	81·9	86·6	+0·6	78·3	+0·8	82·5	+0·7	8·3	90·3	2nd	74·9	29th	15·4
	Mymensingh	55·18	29·522	—·053	29·530	29·673	28th	29·358	6th	·315	81·2	87·1	-1·4	78·5	+1·2	82·8	—0·1	8·6	92·2	20th	74·6	9th	17·6
Deltaic Bengal	Furreedpore	39	29·538	?	29·524	29·712	28th	29·406	10th	·306	82·0	87·0	?	78·7	?	82·8	?	8·3	91·5	2nd	75·9	28th	15·6
	Jessore	33·29	29·521	—·054	29·500	29·708	28th	29·400	10th	·308	82·0	88·1	—1·4	78·6	-0·5	83·4	—1·0	9·5	92·7	3rd	75·9	30th	16·8
	Calcutta	21·38	29·522	—·047	29·488	29·720	28th	29·390	25th	·330	81·6	87·7	—0·4	78·9	+0·5	83·3	+0·1	8·8	94·1	3rd	76·2	30th	17·9
	Saugor Island	25·3	29·518	-·051	29·487	29·705	28th	29·382	25th	·323	82·5	87·4	0·3	80·4	0	84·0	-0·2	7·0	91·2	3rd	76·5	27th	14·7
	Kishnaghur	46·64	29·491	?	29·486	29·670	28th	29·371	10th	·299	82·6	89·1	?	78·8	?	84·0	?	10·3	93·8	3rd & 16th.	76·2	6th & 28th.	17·6
	Midnapore	148·88	29·396	?	29·490	29·568	29th	29·288	10th	·280	82·2	89·8	?	78·5	?	84·2	?	11·3	96·3	2nd	72·2	3rd	24·1
Central Bengal	Bankoora	300	29·230	?	29·476	29·385	28th	29·124	10th	·261	81·5	89·2	?	78·2	?	83·7	?	11·0	94·1	2nd & 3rd.	74·6	6th	19·5
	Raneegunge	345·15	29·211	?	29·502	29·388	28th	29·086	10th	·302	81·1	90·0	?	78·3	?	84·2	?	11·7	94·5	2nd & 11th.	74·9	30th & 31st.	19·6
	Burdwan	99·09	29·451	—·039	29·496	29·632	28th	29·343	10th	·289	81·7	89·8	—0·5	79·2	-0·2	84·6	—0·4	10·6	95·1	4th	76·4	6th & 28th.	18·7

* Mean of 20 days.

I.

in India, Burma, &c., in July 1891.

Wind Direction. Number of Winds from: Calm.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	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 1891.	Normal rainfall for period, 1st June to 31st July.	Variation from normal of period.	Station.	Meteorological Province or District.
...	...	...	...	...	...	...	...	...	...	...		...	...	...	...	...	...	39·60	31·68	+7·92	...	...	...	**Burma Coast and Bay Islands.**	
...	...	...	...	...	...	19	12	...	16	11	+45	84	·915	8·7	11	...	...	7·88	15·98	— 8·10	30·39	34·77	— 4·38	Port Blair .	BAY ISLANDS.
...	2	...	...	...	...	16	11	2	2	2	0	91	·870	9·7	22	...	...	30·25	31·99	— 1·74	63·08	63·43	— 0·35	Mergui .	TENASSERIM.
15	1	...	...	...	1	9	1	4	2	?	?	93	·878	8·9	31	...	...	61·17	46·53	+14·64	105·77	86·55	+19·22	Tavoy.	
...	4	1	1	7	5	8	...	5	4	4	0	95	·883	8·6	30	...	...	64·16	47·88	+16·28	113·94	84·09	+29·85	Moulmein.	
...	...	...	...	17	13	1	...	...	6	5	+20	93	·897	9·7	27	...	...	14·87	18·43	— 3·56	22·51	33·60	—11·09	Toungoo.	
...	1	...	...	...	4	15	9	2	5	5	0	94	·890	9·4	27	...	...	26·76	21·94	+ 4·82	53·72	40·04	+13·68	Rangoon .	LOWER BURMA.
	...	...	...	3	8	12	3	...	6	4	+50	94	·914	8·5	28	...	...	37·57	24·37	+13·20	78·30	46·68	+31·62	Bassein.	
1	...	...	...	...	7	18	5	...	9	9	0	86	·905	9·3	26	...	...	39·56	25·81	+13·75	64·61	49·44	+15·17	Diamond Island.	
...	1	1	5	6	14	3	1	...	5	4	+25	93	·955	9·2	29	...	...	74·19	52·20	+21·99	105·68	92·99	+12·69	Akyab .	ARAKAN.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	7·84	11·39	—3·56	...	...	...	**Burma, Inland.**	
...	...	...	...	2	29	...	...	...	9	7	+29	85	·868	8·7	12	...	...	7·70	6·87	+ 0·83	13·29	13·91	— 0·62	Thayetmyo	CENTRAL BURMA.
...	...	...	1	...	30	...	...	...	?	?	?	73	·862	8	3	...	...	0·56	3·95	— 3·39	3·35	10·55	— 7·20	Mandalay .	UPPER BURMA.
23	...	2	1	1	2	2	..	...	4	?	?	92	1·007	1·5	14	...	...	8·92	14·82	— 5·90	26·44	22·79	+ 3·65	Kindat.	
2	...	7	...	...	...	8	3	11	?	?	?	89	·911	8	18	...	...	14·16	19·92	— 5·76	27·91	35·64	— 7·73	Bhamo.	
...	...	...	...	...	...	..	...	...	...	...	...	...	...	...	...	...	..	18·53	14·39	+4·14	...	...	...	**Assam.**	
20	...	5	4	2	...	...	...	...	1	3	—67	89	·945	9·2	24	...	...	17·75	18·05	— 0·30	34·74	39·41	— 4·67	Silchar .	ASSAM (SURMA).
...	...	14	4	3	...	9	1	...	2	3	—33	91	1·017	8·8	21	...	...	16·31	15·22	+ 1·09	27·73	28·58	— 0·85	Sibsagar .	BRAHMAPUTRA.
6	1		6	2	...	7	3	...	5	4	+25	91	·924	8·3	17	...	...	21·54	9·91	+11·63	35·90	35·29	+ 0·61	Dhubri.	
...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	14·05	14·18	—0·29	...	...	...	**Bengal and Orissa.**	
1	...	...	4	16	6	2	...		6	7	—14	89	·931	8·2	15	...	...	31·72	20·42	+11·30	40·08	43·86	— 3·78	Chittagong	EAST BENGAL.
			Not	recor	ded.				?	?	?	90	·665	?	27	...	...	31·16	?	?	50·95	?	?	Lungleh.	
...	...	...	9	12		4	1	...		?	?	90	?	4·8	21	...	...	19·96	21·31	— 1·35	35·81	45·03	— 9·22	Noakholly.	
...	...	...	1	18	9	3	...	...	6	?	?	88	?	4·5	17	...	...	10·25	17·67	— 7·42	20·92	36·12	—15·20	Comillah.	
...	...	1	9	9	10	2	...	...	4	?	?	91	?	7·6	10	...	...	9·28	?	?	22·07	?	?	Serajgunj.	
...	...	...	5	12	10	3	1	...	9	7	+29	90	·966	8·4	18	...	...	12·15	12·63	— 0·48	27·60	24·88	+ 2·72	Dacca.	
8	...	...	1	8	9	4	1	...	5	?	?	88	·965	7·8	19	...	...	17·00	15·81	+ 1·19	22·76	32·04	— 9·28	Burrisal.	
2	...	2	11	12	2	1	1	...	6	?	?	90	·955	7·0	20	...	...	10·73	14·26	— 3·53	26·42	33·04	— 6·62	Mymensingh.	
3	...	...	3	12	7	6	...	...	5	?	?	90	?	7·2	18	...	...	14·88	12·68	+ 2·20	24·80	25·80	— 1·00	Furreedpore	DELTAIC BENGAL.
6	...	...	3	12	3	5	1	1	4	5	—20	91	·992	9·1	24	...	...	11·71	12·55	— 0·84	18·48	24·24	— 5·76	Jessore.	
...	1	...	7	6	3	8	6	...	6	5	+20	88	·949	8·5	14	...	...	8·28	12·79	— 4·51	14·21	22·06	— 7·85	Calcutta.	
...	...	2	1	2		13	6	1	19	14	+36	87	·972	9·1	18	...	...	19·89	17·00	+ 2·89	29·95	26·29	+ 3·66	Saugor Island.	
1	...	...	6	8	5	6	4			?	?	86	?	8·3	17	...	...	12·93	10·26	+ 2·67	19·95	19·77	+ 0·18	Kishnaghur.	
3	3	4	...	2	15	2	...	2	9	?	?	86	?	4·3	14	...	...	8·22	12·55	— 4·33	13·15	22·05	— 8·90	Midnapore.	
7	...	1	7	2	3	2	9	...	5	?	?	88	?	8·0	15	...	...	10·48	12·71	— 2·23	15·38	22·52	— 7·14	Bankoora .	CENTRAL BENGAL.
5	1	2	6	5	2	6	2	2	4	?	?	88	?	8·8	12	...	...	9·08	?	?	15·16	?	?	Raneegunge.	
1	1	...	5	6	7	8	3	...	4	4		84	·907	9·1	18	...	...	14·00	12·11	+ 1·89	16·85	19·75	— 2·90	Burdwan.	

Table

Abstract of Observations taken at 8 A.M., at 159 Stations

Meteorological Province or District.	Station.	Height of Station 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.
Central Bengal—*contd.*	Nya Doomka	490	29·039	?	29·481	29·201	28th	28·925	10th	·276	81·4	88·8	?	77·8	?	83·3	?	11·0	93·1	9th & 16th	74·8	16th	18·3
	Berhampore	66·45	29·474	—·055	29·489	29·647	28th	29·345	10th	·302	81·2	89·0	—0·5	78·7	0	83·9	—0·3	10·3	92·7	3rd	75·3	28th & 30th.	17·4
	Rampore Bauleah.	70	29·475	?	29·494	29·639	28th	29·343	10th	·296	82·1	88·3	?	79·0	?	83·7	?	9·3	91·3	20th	74·6	30th	16·7
	Maldah	80	29·456	?	29·486	29·608	28th	29·313	5th	·295	82·9	90·6	?	79·0	?	84·8	?	11·6	95·1	20th	76·5	28th & 29th.	18·6
	Bogra	61·48	29·483	—·040	29·496	29·636	28th	29·326	6th	·310	82·4	88·7	—0·1	78·9	+0·5	83·8	+0·2	9·8	92·8	20th	74·2	29th	18·6
North Bengal	Dinagepore	117·59	29·434	—·070	29·503	29·575	12th	29·291	5th	·284	81·4	88·6	—1·1	78·9	+0·1	83·7	—0·5	9·7	93·6	20th	76·2	3rd, 8th & 25th	17·4
	Rungpore	123	29·452	?	29·527	29·601	28th	29·255	6th	·346	81·5	89·1	?	78·5	?	83·8	?	10·6	93·8	20th & 27th	76·2	9th, 25th & 28th.	17·6
	Jalpaiguri	283·7	29·279	—·036	29·514	29·428	28th	29·125	6th	·303	81·2	88·0	—0·9	77·1	+0·6	82·5	—0·2	10·9	93·4	20th & 27th	74·6	23rd	18·8
Orissa	Balasore	53·98	29·489	—·052	29·489	29·680	28th	29·382	26th	·298	81·5	87·9	—0·5	77·9	+0·4	83·0	—0·1	10·0	94·4	2nd & 30th	74·8	26th	19·6
	False Point	20·60	29·556	—·036	29·519	29·744	28th	29·457	11th	·287	81·8	87·4	—0·2	77·9	—0·5	82·7	—0·4	9·5	93·5	30th	75·1	7th & 12th.	18·4
	Cuttack	80	29·497	—·025	29·519	29·668	28th & 29th	29·389	26th	·279	82·3	89·5	—0·3	78·6	+0·1	84·1	- 0·1	10·9	96·4	2nd	75·3	7th	21·1
	Shortt's Island	?	29·520*	?	?	29·689	28th	29·410	25th	·279	81·9*	87·2	?	78·9	?	83·1	?	8·3	93·2	30th	74·4	31st	18·8
	Pooree	11·99	29·554	?	29·503	29·732	28th	29·453	11th	·279	81·7	85·9	?	79·7	?	82·8	?	6·2	93·7	31st	72·6	11th	21·1
Gangetic Plain and Chutia-Nagpur.		...	...	—·045	...	...	...	...	...	...		91·7	+1·9	79·0	+0·6	85·4	+1·2	12·7	...	...	...	...	23·2
Chutia-Nagpur	Hazaribagh	2,007·12	27·556	—·039	29·488	27·695	29th	27·425	26th	·270	76·4	84·7	+0·2	73·6‡	0	79·2‡	+0·1	11·1	90·7	10th	71·1	6th	19·6
	Ranchee	2,128·14	27·437	?	29·481	27·587	29th	27·293	26th	·294	76·4	84·0	?	73·2	?	78·6	?	10·8	90·0	10th	69·4	27th	20·6
	Chybassa	760	28·780	—·028	29·481	28·954	29th	28·657	26th	·297	80·6	88·8	—0·1	77·4	+0·1	83·1	0	11·4	96·3	2nd	73·7	17th & 18th.	22·6
Behar, South	Gya	374·5	29·150	—·050	29·474	29·300	29th	29·043	10th	·257	83·1	91·8	+0·3	79·6	+1·2	85·7	+0·8	12·2	98·0	10th	76·3	10th	21·7
	Dehree	351·14	29·175‡	?	29·475‡	29·276	29th	29·055	10th	·221	84·1§	92·9§	?	80·1§	?	86·5§	?	12·8	98·9	10th	73·5	3rd	25·4
	Patna	182·84	29·342	—·059	29·475	29·498	29th	29·224	10th	·274	83·4	90·3	—0·3	79·5	—0·3	84·9	—0·3	10·8	94·4	4 days	73·7	8th	20·7
	Arrah	190·02	29·333*	?	29·472*	29·474	29th	29·236	6th	·238	84·0*	91·8*	?	80·0†	?	85·9†	?	11·8	98·4	8th	76·6	6th & 17th	21·8
	Buxar	239·22	29·269	?	29·458	29·419	29th	29·127	10th	·292	85·0	93·6	?	80·4	?	87·0	?	13·2	101·4	10th	75·8	18th	25·6
Behar, North	Purneah	125	29·422	—·048	29·499	29·571	28th	29·297	5th	·274	82·1	88·9	—1·6	77·5	—1·1	83·2	—1·4	11·4	93·2	20th	75·7	6 days	17·5
	Bhagalpur	159·78	29·367	?	29·479	29·513	28th	29·252	10th	·261	82·4	89·5	?	79·1	?	84·3	?	10·4	93·2	4 days	76·5	30th	16·7
	Durbhunga	166·32	29·387	—·037	29·505	29·531	28th	29·267	6th	·264	82·9	90·2	+1·1	79·3	—0·5	84·8	+0·3	10·9	94·9	5th	76·5	7th & 28th.	18·4
	Mozufferpore	178·42	29·343	?	29·473	29·489	29th	29·222	6th	·267	81·9	89·7	?	78·7	?	84·2	?	11·0	93·4	23rd	70·7	5th	22·7
	Motiharee	223·61	29·307	?	29·485	29·453	29th	29·178	10th	·275	82·1	90·1	?	78·5	?	84·3	?	11·6	94·2	20th, & 21st	73·8	15th	20·4
	Chupra	181·3	29·331	?	29·463	29·482	29th	29·198	10th	·284	83·7	91·6	?	79·1	?	85·4	?	12·5	96·3	10th.	76·6	6th	19·7
N.-W. Provinces (Eastern Districts).	Benares	266·97	29·246	—·044	29·467	29·394	29th	29·119	10th	·275	84·8	96·2	+4·7	80·9	+1·4	88·6	+3·1	15·3	105·3	11th	76·0	12th	29·3
	Allahabad	309·28	29·196	—·052	29·458	29·356	29th	29·072	10th	·284	86·2	98·9	+7·7	81·6	+2·4	90·3	+5·1	17·3	108·9	11th	76·6	15th	32·3
N.-W. Provinces (Eastern Sub-montane).	Gorakhpur	255·93	29·264	—·044	29·478	29·410	29th	29·091	10th	·319	83·4	91·6	+0·3	79·9	+0·2	85·8	+0·3	11·7	97·3	9th & 10th.	75·7	29th	21·6
Oudh, South	Lucknow	369·4	29·147	—·045	29·473	29·305	29th	29·007	10th	·298	85·8	98·3	+6·3	81·5	+2·1	90·0	+4·2	16·8	107·8	11th	75·8	4th	32·0
N.-W. Provinces (Central).	Cawnpore	415·57	29·075	?	29·442	29·224	29th	28·950	10th	·274	87·0	99·1	?	82·0‡	?	90·2‡	?	17·1	109·1	11th	77·1	29th	32·0
Upper—Sub-Himalayas		...	...	—·050	...	...	...	...	...	...	...	99·4	+5·4	80·6	+2·1	90·0	+3·8	18·8	...	...	..	...	38·2
N.-W. Provinces (Sub-montane).	Bareilly	568·47	28·943	—·045	29·470	29·068	29th	28·785	10th	·283	84·2	96·7	+4·9	80·3	+1·6	88·5	+3·3	16·4	108·4	11th	74·6	4th & 29th.	33·8
	Dehra Dun	2,232·4	27·341	?	29·497	27·470	12th	27·188	10th	·282	78·2	88·3	?	74·7	?	81·5	?	13·6	99·5	11th	67·0	6th	32·5
	Roorkee	886·63	28·631	—·048	29·474	28·773	12th	28·475	10th	·298	84·6	97·6	+5·8	80·6	+2·6	89·1	+4·2	17·0	110·7	11th	75·0	26th	35·7
	Meerut	737·48	28·769	—·044	29·461	28·879	12th	28·625	10th	·254	86·2	98·9	+6·1	82·0	+2·3	90·4	+4·2	16·9	109·2	9th & 12th.	75·9	26th & 29th.	33·3
Punjab (Central).	Delhi	717·81	28·783	—·050	29·450	28·902	12th	28·660	6th	·242	88·7	100·5	+6·5	84·3	+3·9	92·4	+5·2	16·2	110·0	4th	76·1	25th	33·9
	Lahore	702·2	28·769	—·052	29·427	28·917	29th	28·640	10th	·277	89·1	103·9	+5·1	81·7	+0·9	92·8	+3·0	22·2	117·8	22nd	73·4	17th & 29th.	44·4

* Mean of 3 days. † Mean of 29 days. § Mean of 28 days. ‡ Mean of 27 days.

I—*continued.*

in India, Burma, &c., in July 1891—continued.

Wind Direction. Number of Winds from: Calm.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	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 1891.	Normal rainfall for period, 1st June to 31st July.	Variation from normal of period.	Station.	Meteorological Province or District.
2	1	1	8	5	3	3	4	4	7	?	?	86	?	5·5	15	...	...	11·27	13·70	−2·43	15·16	22·61	−7·45	Nya Doomka	Central Bengal, —*contd.*
...	1	...	12	5	4	6	3	...	6	5	+20	92	·983	8·6	14	...	...	9·77	10·38	−0·61	13·97	18·77	−4·80	Berhampore.	
...	...	1	5	11	6	6	2	...	6	?	?	88	?	6·0	16	...	...	17·39	11·43	+5·96	25·90	22·08	+3·82	Rampore Bauleah.	
3	...	1	2	20	1	3	...	1	4	?	?	88	?	6·5	17	...	...	12·06	10·67	+1·39	18·39	20·53	−2·14	Maldah.	
5	...	...	10	13	1	...	2	...	4	?	?	88	·976	6·2	13	...	...	9·86	13·66	−3·80	18·68	27·48	−8·80	Bogra.	
...	...	5	16	5	1	1	1	2	3	?	?	90	·965	8·7	21	...	...	21·80	13·32	+8·48	25·31	29·74	−4·43	Dinagepore.	North Bengal.
2	1	1	18	3	6	...	...	...	3	?	?	90	?	3·4	19	...	...	20·91	15·80	+5·11	31·85	37·11	−5·26	Rungpore.	
				Not recorded.					5	?	?	94	·999	2·6	22	...	...	19·99	25·54	−5·55	29·73	54·03	−24·30	Jalpaiguri.	
	1	1	1	1	7	12	2	3	6	?	?	92	·989	5·9	14	...	...	10·31	13·96	−3·65	15·63	22·76	−7·13	Balasore .	Orissa.
...	...	...	1	...	3	18	9	...	13	11	+18	87	·942	9·0	10	...	...	14·00	12·80	+1·20	16·59	19·34	−2·75	False Point.	
8	...	...	2	...	1	13	5	2	4	3	+33	78	·854	8·5	12	...	...	8·64	12·78	−4·14	11·37	22·18	−10·81	Cuttack.	
...	...	1	1	...	1	9	18	...	16†	?	?	85*	·924*	8·1*	12	...	...	10·62	?	?	11·66	?	?	Shortt's Island.	
5	2	...	...	...	...	13	10	1	15	?	?	86	?	8·3	5	...	...	3·06	9·93	−6·87	3·94	17·65	−13·71	Pooree.	
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	7·67	11·91	−4·05	...	...	...	**Gangetic Plain and Chutia-Nagpur.**	
...	...	...	6	3	5	3	9	5	11	8	+38	88	·794	9·8	16	...	...	11·16	12·97	−1·81	15·04	20·34	−5·30	Hazaribagh.	Chutia-Nagpur.
5	...	4	3	1	2	9	5	2	7	?	?	85	?	8·8	15	...	...	8·45	12·61	−4·16	10·85	20·33	−9·48	Ranchee.	
10	...	1	...	2	1	11	5	1	2	?	?	83	·878	8·6	17	...	...	9·52	13·75	−4·23	13·34	22·16	−8·82	Chybassa.	
...	...	...	10	1	7	...	12	1	6	3	+100	84	·948	6·2	10	...	...	7·40	13·08	−5·68	13·75	19·59	−5·84	Gya .	Behar, South.
3	...	1	8	5	1	4	6	...	10‡	?	?	79§	?	5·8§	9	...	...	4·34	?	?	8·81	?	?	Dehree.	
...	...	1	20	1	1	3	5	...	6	4	+50	84	·958	8·5	14	...	...	7·23	12·96	−5·73	17·74	19·76	−2·02	Patna.	
...	1	6	11	5	...	2	4	1	2†	?	?	85*	?	3·9*	10	...	...	5·33	12·65	−7·32	12·63	19·16	−6·53	Arrah.	
2	...	2	17	...	1	1	7	1	10	?	?	79	?	6·9	5	...	...	2·32	11·34	−9·02	4·25	16·33	−12·08	Buxar.	
11	...	2	7	6	2	1	1	1	2	3	−33	88	·971	7·1	20	...	...	8·97	13·04	−4·07	14·91	24·89	−9·98	Purneah .	Behar, North.
11	...	2	7	4	2	3	2	...	2	?	?	89	?	9·0	16	...	...	18·15	11·55	+6·60	22·18	19·85	+2·33	Bhagalpur.	
1	1	4	12	7	1	2	1	2	5	5	0	86	·965	7·0	14	...	...	10·46	11·19	−0·73	16·01	20·61	−4·60	Durbhunga.	
1	...	2	13	8	1	2	2	2	7	?	?	88	?	7·0	13	...	...	12·49	11·04	+1·45	21·13	18·21	+2·92	Mozufferpore.	
1	...	11	12	6	...	...	...	1	7	?	?	86	?	7·1	15	...	...	9·96	11·41	−1·45	18·74	20·12	−1·38	Motiharee.	
...	1	1	16	5	...	6	2	...	6	?	?	86	?	5·6	9	...	...	7·35	10·93	−3·58	11·91	16·98	−5·07	Chupra.	
3	...	6	10	...	1	6	5	...	7	5	+40	79	·944	6·8	8	...	...	3·81	10·80	−6·99	4·96	15·33	−10·37	Benares .	N.-W. Provinces (Eastern Districts).
4	...	6	9	1	...	3	6	2	10	4	+150	76	·937	6·6	10	...	...	4·71	11·38	−6·67	5·06	16·06	−11·00	Allahabad.	
3	2	3	15	2	2	...	4	...	2	3	−33	83	·957	5·0	6	...	...	6·32	13·23	−6·91	25·82	21·45	+4·37	Gorakhpur	N.-W. Provinces (Eastern Sub-montane).
5	...	2	14	4	...	3	3	...	5	4	+25	74	·907	6·8	9	...	..	3·11	10·47	−7·36	4·07	15·09	−11·02	Lucknow .	Oudh, South.
...	...	4	8	7	1	6	4	1	7	?	?	73	·932	7·6	8	...	...	4·69	9·99	−5·30	4·79	13·08	−8·29	Cawnpore .	N.-W. Provinces (Central).
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4·59	12·25	−7·66	...	...	...	**Upper—Sub-Himalayas.**	
6	...	...	2	19	...	1	1	2	3	4	−25	78	·915	4·4	8	...	...	5·32	16·86	−11·54	8·57	22·14	−13·57	Bareilly .	N.-W. Provinces (Sub-montane).
27	...	1	1	1	1	...	...	...	1	1	0	82	·792	6·7	17	...	...	13·04	29·11	−16·07	16·73	38·21	−21·48	Dehra Dun.	
5	...	...	1	20	3	...	1	1	4	3	+33	70	·816	4·9	2	...	...	2·59	13·13	−10·54	9·13	17·61	−8·48	Roorkee.	
7	...	...	11	8	...	...	5	...	3	2	+50	69	·852	5·4	3	...	...	2·12	9·51	−7·39	2·37	12·10	−9·73	Meerut.	
4	...	...	9	7	...	2	9	...	2	4	−50	59	·771	7·1	8	...	...	4·90	9·08	−4·18	5·68	12·91	−7·23	Delhi .	Punjab (Central).
6	1	1	4	8	2	4	2	3	3	3	0	55	·716	3·8	2	...	...	1·56	6·57	−5·01	1·92	8·41	−6·49	Lahore.	

Table

Abstract of Observations taken at 8 A.M., at 159 Stations

Meteorological Province or District.	Station.	Height of Station in feet.	Pressure, 8 A.M., in inches. 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.	Temperature of Air. 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.
Punjab (Sub-montane).	Ludhiana	811·86	28·665	—·067	29·427	28·783	18th	28·516	10th	·267	89·4	103·7	+5·5	83·3	+3·4	93·5	+4·5	20·4	115·3	11th	75·1	25th	40·2
Punjab (North).	Sialkot	829·47	28·645	—·055	29·430	28·812	29th	28·518	10th	·294	88·7	103·1	+5·4	81·4	+2·3	92·3	+3·9	21·7	116·4	12th	69·3	27th	47·1
	Rawalpindi	1,648·9	27·855	—·042	29·408	28·019	29th	27·740	10th & 15th.	·279	86·4	102·0	+4·2	76·8	0	89·5	+2·1	25·2	113·5	13th & 22nd.	70·7	10th	42·8
Indus Valley and North-West Rajputana.		...	...	—·032	...	...	...	...	...	...	...	104·3	+3·8	81·7	+0·4	93·0	+2·1	22·6	...	...	...	...	38·3
Punjab, West	Peshawar	1,110·4	28·391	—·027	29·410	28·548	29th	28·262	15th	·286	89·2	106·5	+3·7	77·1	−2·1	91·8	+0·8	29·4	115·0	2 days	71·9	2 days	43·1
	Khushab	611·51	28·836	?	29·403	29·006	29th	28·715	15th	·291	91·0	113·5	?	79·1	?	96·3	?	34·4	119·1	3 days	70·0	16th	49·1
	Montgomery	558·46	28·894	?	29·407	29·029	18th	28·783	10th	·246	91·4	107·1	?	84·5	?	95·9	?	22·6	120·4	23rd	74·1	26th	46·3
	D. I. Khan	572·56	28·867	—·061	29·399	29·031	29th	28·760	10th	·271	89·4	108·7	+5·2	82·1	0	95·4	+2·6	26·6	120·5	14th	73·8	2 days	46·7
	Mooltan	420·19	29·023	—·047	29·399	29·161	17th	28·902	15th	·259	90·2	108·0	+4·9	84·1	+1·3	96·1	+3·1	23·9	116·8	23rd	78·2	4 days	38·6
	Sirsa	661·61	28·817	—·050	29·429	28·927	12th	28·719	10th	·208	90·1	104·8	+4·9	84·6	+3·5	94·7	+4·2	20·2	118·4	22nd	75·3	26th	43·1
Sind and Cutch.	Jacobabad	185·9	29·264	—·026	29·407	29·404	18th	29·137	5th	·267	89·4	110·9	+3·6	84·1	+0·2	97·5	+1·9	26·8	119·0	3 days	73·7	17th	45·3
	Hyderabad	117·43	29·377	−·007	29·447	29·516	18th	29·236	6th	·280	85·3	102·5	+3·5	80·4	−0·1	91·5	+1·7	22·1	107·2	29th	75·1	11th	32·1
	Kurrachee	49	29·504	—·005	29·505	29·649	18th	29·383	6th	·266	83·7	91·0	+0·9	80·3	−0·2	85·7	+0·4	10·7	93·1	1st	78·7	4 days	14·4
	Bhuj	394·9	29·178	?	29·519	29·315	18th	29·089	27th	·226	84·0	94·3	?	79·1	?	86·7	?	15·2	100·5	3rd & 4th.	72·3	29th	28·2
Rajputana, West	Bickaneer	743·5	29·069	?	29·763	29·142	20th	28·950	26th	·192	90·1	102·8	?	84·5	?	93·7	?	18·3	114·3	22nd	76·2	31st	38·1
	Pachpadra	380	29·126	?	29·453	29·243	13th	29·055	29th	·188	86·1	101·3	?	80·5*	?	90·7*	?	20·8	109·5	21st	74·6	31st	34·9
East Rajputana, Central India and Guzerat.		...	...	—·033	...	...	...	...	...	...	...	93·9	+5·2	79·1	+2·4	86·5	+3·8	14·8	...	...	...	...	29·5
Rajputana, East	Jeypore	1,430·6	28·114	—·038	29·484	28·222	17th	28·015	28th	·207	84·8	99·7	+7·9	80·7	+3·9	90·2	+5·9	19·0	111·3	22nd	73·0	29th	38·3
	Sambhar	1,253·52	28·265	—·046	29·462	28·369	18th	28·174	28th	·195	85·3	98·8	+6·8	81·8	+4·2	90·3	+5·5	17·0	110·0	22nd	74·4	29th	35·6
	Ajmere	1,611	27·945	—·041	29·497	28·062	18th	27·804	29th	·258	82·5	96·4	+5·3	79·9	+3·5	88·2	+4·4	16·5	107·5	22nd	72·6	31st	34·9
	Deesa	465·5	29·112	—·019	29·530	29·243	18th	28·980	27th	·263	82·8	97·3	+5·8	78·8	+1·3	88·1	+3·6	18·5	104·9	21st	73·8	26th & 27th.	31·1
Kathiawar	Rajkot	428·83	29·187	—·008	29·566	29·306	18th	29·068	27th	·238	82·5	93·2	+2·9	77·1	+1·7	85·2	+2·3	16·1	101·9	1st	72·3	7th	29·6
	Veraval	?	29·632	?	29·594	29·743	18th	29·477	27th	·266	80·7	83·4	?	78·7	?	81·1	?	4·7	90·8	1st	73·3	28th	17·5
	Bhavnagar	?	29·574	?	29·561	29·730	18th	29·263	29th	·467	84·0	93·8	?	79·9	?	86·8	?	13·9	101·4	20th	74·5	28th & 30th.	26·9
Central India	Nowgong	757·04	28·772	—·040	29·479	28·884	30th	28·631	27th	·253	83·7	94·9	+4·6	80·5	+2·5	87·7	+3·6	14·4	104·1	3rd	75·1	7th	29·0
	Sutna	1,040·1	28·475	−·049	29·467	28·628	29th	28·300	27th	·328	82·9	92·6	+6·0	78·0	+1·3	85·3	+3·7	14·6	103·1	11th.	72·6	18th	30·5
	Indore	1,823·2	27·789	—·030	29·559	27·913	17th	27·616	27th	·297	73·3	86·9	+2·8	72·8	+0·5	79·9	+1·7	14·1	95·1	20th	69·6	29th	25·5
	Neemuch	1,630	27·949	—·030	29·525	28·085	17th	27·803	27th	·282	80·1	92·6	+5·7	75·3	+1·6	84·0	+3·7	17·3	97·8	11th & 15th.	69·6	29th	28·2
Guzerat	Surat	36	29·631	—·005	29·612	29·743	18th	29·468	27th	·275	81·1	86·6	−0·5	77·7	+0·4	82·2	−0·1	8·9	91·6	13th	72·5	28th	19·1
N.-W. P. (West)	Agra	555·44	28·959	—·049	29·465	29·062	13th & 17th.	28·867	10th	·195	88·8	100·6	+7·8	83·8	+3·6	92·2	+5·7	16·8	111·0	4th	74·5	29th	36·5
	Jhansi	840·13	28·671	−·040	29·457	28·785	17th	28·547	28th	·238	85·7	97·9	+7·5	82·4	+4·2	90·2	+5·9	15·5	106·5	11th	75·9	2 days	30·6
Deccan		...	...	—·022	...	...	...	...	...	...	...	86·7	+1·5	73·3	+0·7	80·0	+1·2	13·4	...	...	...	...	27·3
Bombay, Deccan	Belgaum	2,524	27·260	—·008	29·729	27·341	8th	27·156	2nd	·185	70·4	75·5	−0·1	67·3	+0·4	71·4	+0·2	8·2	82·3	13th	64·8	2nd	17·5
	Sholapur	1,589·7	28·146	—·006	29·679	28·234	17th	28·049	27th	·185	78·1	91·2	+2·6	72·7	+1·5	82·0	+2·1	18·5	99·7	12th & 13th.	70·0	14th & 20th.	29·7
	Poona	1,840·37	27·884	—·012	29·672	27·967	17th	27·756	27th	·211	75·8	83·8	+2·1	71·3	+0·7	77·6	+1·4	12·5	91·6	13th & 15th.	68·4	14th	23·2
Khandeish	Malegaon	1,430·12	28·244	—·005	29·627	28·352	18th	28·074	27th	·278	78·5	86·9	+0·4	73·5	+0·7	80·2	+0·6	13·4	96·4	13th	70·7	20th & 21st.	25·7
	Ahmednagar	2,151·62	27·565	?	29·656	27·664	18th	27·437	27th	·227	75·4	85·5	?	71·0	?	78·3	?	14·5	94·8	13th	57·5	28th	37·3
Berar	Akola	930	28·708	—·024	29·591	28·814	17th	28·569	27th	·245	78·3	88·9	+1·0	74·4	+0·5	81·7	+0·8	14·5	97·8	11th	69·7	20th	28·1
	Amraoti	1,215·5	28·411	—·021	29·585	28·524	30th	28·275	27th	·249	76·3	87·1	+0·4	73·5	+0·5	80·3	+0·5	13·6	97·8	11th	69·3	14th	28·5

I —*continued.*

in India, Burma, &c., in July 1891 —continued.

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.	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 June to 31st July 1891.	Normal rainfall for period, 1st June to 31st July.	Variation from normal of period.	Station.	Meteorological Province or District.
10	2	...	2	7	5	...	4	1	3	2	+50	61	·811	3·6	4	...	...	3·39	11·20	−7·81	4·36	13·67	−9·31	Ludhiana.	Punjab (Sub-montane).
...	5	3	14	4	4	...	1	...	3	2	+50	58	·751	2·9	7	...	...	6·79	7·67	−0·88	7·14	11·18	−4·04	Sialkot .	Punjab, North.
12	...	2	1	10	...	3	...	3	2	2	0	51	·636	2·5	2	...	...	1·64	7·12	−5·48	1·94	8·78	−6·84	Rawalpindi.	
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2·20	2·98	−0·78	...	...	...	**Indus Valley and North-West Rajputana.**	
4	6	4	4	...	4	1	3	5	4	4	0	48	·640	1·9	1	...	...	0·20	1·44	−1·24	0·34	1·91	−1·57	Peshawar .	Punjab, West.
3	3	9	6	1	3	2	3	1	6	?	?	48	·664	2·7	3	...	...	2·30	2·86	−0·56	2·41	3·56	−1·15	Khushab.	
2	2	3	5	5	6	4	2	2	11	?	?	57	·816	3·0	4	...	...	3·26	3·06	+0·20	3·26	4·35	−1·09	Montgomery	
20	...	2	5	1	...	1	2	...	1	2	−50	55	·749	1·9	2	...	...	1·70	2·61	−0·91	2·20	3·13	−0·93	D. I. Khan.	
9	...	3	...	3	...	11	1	4	2	3	−·33	44	·618	1·0	1	...	...	0·12	2·17	−2·05	0·12	2·85	−2·73	Mooltan.	
1	2	2	6	2	3	6	9	...	10	5	+100	57	·783	5·8	5	...	...	4·12	4·04	+0·08	4·57	5·94	−1·37	Sirsa.	
7	...	2	5	14	3	...	...	...	5	3	+67	58	·803	1·3	1	...	...	0·35	1·54	−1·19	0·40	1·54	−1·14	Jacobabad	Sind and Cutch.
...	...	...	...	...	1	26	1	3	18	14	+29	63	·763	6·7	1	...	...	0·51	2·86	−2·35	0·51	3·00	−2·49	Hyderabad.	
..	...	...	...	...	...	5	22	4	18	18	0	78	·915	7·5	0	...	...	0	3·64	−3·64	0·01	3·76	−3·75	Kurrachee.	
...	...	...	...	...	...	8	19	4	20	17	+18	76	·884	6·5	4	...	...	4·10	5·46	−1·36	4·10	7·63	−3·53	Bhuj.	
...	1	5	1	1	6	17	...	...	10	7	+43	55	·760	?	4	...	...	2·58	3·47	−0·89	2·60	5·25	−2·65	Bickaneer .	Rajputana, West.
...	1	1	1	...	3	18	7	...	10*	10	0	70	·873	3·7	3	...	...	7·15	2·64	+4·51	7·15	3·33	+3·82	Pachpadra.	
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	11·09	11·94	−1·35	...	...	...	**East Rajputana, Central India and Guzerat.**	
1	2	3	1	2	...	6	12	4	7	6	+17	66	·786	6·7	10	...	...	6·46	9·61	−3·15	6·84	11·92	−5·08	Jeypore .	Rajputana, East.
2	...	1	2	2	1	2	16	5	13	9	+44	64	·773	4·2	6	...	...	3·83	7·96	−4·13	4·53	9·27	−4·74	Sambhar.	
1	..	...	3	...	1	3	21	2	11	7	+57	73	·802	5·0	9	...	...	3·77	8·13	−4·36	3·87	10·56	−6·69	Ajmere.	
...	7	1	1	...	1	...	8	13	17‡	16	+6	75	·834	8·1	12	...	...	8·57	10·79	−2·22	8·57	12·52	−3·95	Deesa.	
...	...	...	...	...	...	5	21	5	11	14	−21	84	·920	9·0	11	...	...	20·08	14·11	+5·97	21·53	18·94	+2·59	Rajkot .	Kathiawar.
4	...	...	...	...	...	4	21	1	12	?	?	90	·949	7·6	11	...	...	19·93		?	19·96	?	?	Veraval.	
Not recorded.									23	?	?	86‡	1·005‡	8·4	11	...	...	8·25	?	?	9·05	?	?	Bhavnagar.	
2	2	1	4	1	2	1	18	...	6	4	+50	75	·870	8·2	13	...	...	8·30	15·70	−7·40	9·44	20·75	−11·31	Nowgong .	Central India.
...	2	1	3	2	3	4	15	1	9	9	0	76	·843	5·5	14	...	...	12·77	14·75	−1·98	14·10	20·48	−6·38	Sutna.	
1	...	...	...	..	1	7	18	4	7	7	0	85	·789	9·1	13	...	...	7·46	9·72	−2·26	10·07	16·68	−6·61	Indore.	
...	...	1	...	...	...	19	8	2	11	12	−8	81	·833	4·9	12	...	...	6·20	10·48	−4·28	6·20	14·57	−8·37	Neemuch.	
...	...	...	...	...	4	15	10	2	?	16	?	89	·949	8·8	16	...	...	41·88	16·34	+25·54	42·38	24·65	+17·73	Surat .	Guzerat.
...	2	...	1	12	1	12	2	1	7	5	+40	64	·858	5·6	8	...	...	4·11	11·74	−7·63	6·15	14·58	−8·43	Agra . .	N.-W. F. (West).
5	1	4	...	1	3	8	5	4	6	4	+50	70	·857	4·8	11‡	...	...	3·63	13·96	−10·33	3·90	18·08	−14·18	Jhansi.	
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	13·36	12·06	+1·29	...	...	...	**Deccan.**	
...	...	...	...	...	...	5	20	6	5	28	−82	92	·651	9·3	22	...	...	20·10	15·71	+4·39	20·49	23·18	−2·69	Belgaum .	Bombay, Deccan.
...	...	...	...	...	...	17	12	2	17	12	+42	72	·688	8·5	3	...	...	1·21	4·82	−3·61	3·56	10·07	−6·51	Sholapur.	
...	...	...	...	...	...	4	26	1	16	17	−6	79	·702	8·9	12	...	...	8·35	6·97	+1·38	9·01	11·32	−2·31	Poona.	
...	...	...	...	...	...	13	17	1	12	12	0	78	·752	7·6	14	...	...	5·25	5·44	−0·19	7·15	10·43	−3·28	Malegaon .	Khandeish.
...	...	...	...	1	1	8	18	3	15	?	?	86	·761	8·2	7	...	...	2·32	3·29	−0·97	4·21	8·24	−4·03	Ahmednagar	
...	...	...	...	...	...	3	14	14	12	8	+50	81	·779	9·3	15	...	...	10·37	11·17	−0·80	11·10	17·03	−5·93	Akola .	Berar.
...	...	..	...	...	..	3	19	9	13	8	+63	88	·789	8·3	15	...	...	7·82	10·71	−2·89	10·40	18·38	−7·98	Amraoti.	

* Mean of 27 days. † Mean of 21 days. ‡ Mean of 30 days.

Table

Abstract of Observations taken at 8 A.M., at 159 Stations

Meteorological Province or District.	Station.	Height of Station 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.
Central Provinces (West).	Khandwa	1,043·71	28·577	−·018	29·581	28·696	17th	28·416	27th	·280	78·2	88·2	+1·2	75·6	+0·9	82·0	+1·1	12·6	97·2	11th	72·1	14th	25·1
	Hoshangabad	1,020	28·582	−·029	29·561	28·695	17th	28·398	27th	·297	78·9	89·8	+3·7	75·4	+0·5	82·7	+2·1	14·4	101·5	12th	70·7	29th	30·8
	Nagpur	1,025	28·572	−·034	29·552	28·703	29th	28·425	27th	·278	79·0	88·4	+1·4	75·6	+1·0	82·0	+1·2	12·8	100·8	11th	71·6	27th	29·2
Central Provinces (Central).	Seoni	2,030	27·569	−·039	29·562	27·699	29th	27·380	27th	·319	77·5	84·8	+1·2	73·0	+0·6	78·9	+0·9	11·8	96·2	11th	70·1	6 days	26·1
	Jubbulpore	1,327·02	28·241	−·025	29·524	28·373	29th	28·017	27th	·356	77·9	87·4	+1·6	75·2	+0·7	81·3	+1·2	12·2	97·5	1st	72·1	6th & 29th.	25·4
	Saugor	1,761·5	27·809	−·037	29·515	27·927	17th	27·625	27th	·302	77·8	89·0	+4·0	74·8	+1·3	81·9	+2·7	14·2	98·9	13th	71·6	6th & 29th.	27·3
Central Provinces (East).	Raipur	960	28·610	−·028	29·532	28·773	29th	28·468	27th	·305	78·2	86·6	+0·4	74·2	−0·3	80·4	+0·1	12·4	96·0	2nd	70·1	18th	25·9
Hyderabad (South).	Secunderabad	1,786·69	27·928	−·028	29·664	28·037	29th	27·834	20th	·203	75·6	87·4	+1·4	72·3	+1·3	79·8	+1·4	15·1	98·7	11th	68·4	9th	30·3
West Coast		...	...	−·002	...	...	...	...	...	...	...	83·3	+0·4	73·9	+0·4	78·6	+0·4	9·4	...	...	...	...	16·3
Konkan	Bombay	37	29·688	−·016	29·666	29·785	30th	29·559	27th	·226	81·0	83·8	−0·3	78·0	+0·8	80·9	+0·3	5·8	87·9	13th	73·5	21st	14·4
	Ratnagiri	110	29·665	0	29·713	29·765	8th	29·542	2nd	·223	80·5	83·7	0	74·2	−1·1	79·0	−0·6	9·5	87·9	13th	72·4	7 days	15·5
	Mormugao	?	29·749	?	29·745	29·825	30th	29·656	2nd	·169	80·6	83·0	?	76·7	?	79·9	?	6·3	86·0	5th & 14th.	72·4	20th	13·6
	Karwar	43·87	29·790	−·002	29·769	29·875	8th	29·713	2nd	·162	79·4	83·8	+0·7	75·4	+0·9	79·6	+0·8	8·4	86·2	5 days	71·8	2nd	14·4
Malabar	Mangalore	25·60	29·852	−·004	29·812	29·936	30th	29·777	20th	·159	78·3	83·6	+0·9	74·7	+0·7	79·2	+0·8	8·9	87·3	13th	70·9	2nd	16·4
	Calicut	26·58	29·872	−·003	29·832	29·951	29th	29·800	20th	·151	76·7	82·3	?	73·9	?	78·1	?	8·4	86·3	14th	70·1	24th	16·2
	Cochin	11·03	29·913	+·013	29·853	29·999	29th	29·840	12th	·159	77·5	84·0	+0·7	74·6	+0·8	79·3	+0·8	9·4	87·2	12th & 14th.	71·7	26th	15·5
	Trivandrum	?	29·580	?	29·855	29·651	30th	29·499	11th	·152	76·6	82·2	?	63·8	?	73·0	?	18·4	85·0	11th	61·0	24th	24·0
South India		...	...	−·005	...	...	...	...	...	...	...	91·1	+0·6	76·2	+0·6	83·7	+0·6	14·9	...	...	...	...	24·5
Madras, South	Pamban	37	29·813	?	29·777	29·900	29th	29·715	11th	·185	82·1	87·4	?	79·3	?	83·4	?	8·1	92·3	12th	78·2	6 days	14·1
	Madura	446·60	29·385	+·005	29·766	29·469	29th	29·294	11th	·175	84·9	96·3	−1·5	76·8	+0·7	86·6	−0·4	19·5	101·9	14th	67·1	20th	34·8
Madras, South (Central).	Salem	939·91	28·912	−·004	29·799	29·002	29th	28·844	20th	·158	78·3	95·3	+2·6	74·0	+1·8	84·7	+2·2	21·3	100·4	17th	70·5	2nd	29·9
	Coimbatore	1,347·64	28·495	+·004	29·799	28·578	29th	28·425	11th	·153	76·0	88·2	+0·3	70·2	−0·5	79·3	−0·1	18·0	92·3	16th	67·6	2nd	24·7
Coorg	Mercara	3,780·7	26·177	?	29·823	26·248	7th	26·111	20th	·137	64·8	69·0	+0·2	62·9	+0·5	66·0	+0·4	6·1	76·3	14th	60·7	2nd	15·6
Mysore	Bangalore	2,981·46	26·909	−·006	29·816	26·989	29th	26·835	2nd	·154	69·8	81·1	−0·9	65·8	+0·3	73·5	−0·3	15·3	86·2	31st	64·0	3 days	22·2
Madras, East Coast (South).	Negapatam	15	29·795	+·003	29·748	29·881	29th	29·701	11th	·180	84·6	97·0	+1·7	78·3	+0·4	87·7	+1·1	18·7	101·2	15th	74·2	1st	27·0
	Cuddalore	12·44	29·792	?	29·735	29·885	7th	29·703	11th	·182	85·5	99·3	?	80·0	?	89·6	?	19·3	104·3	25th	74·7	2nd & 3rd.	29·6
	Trichinopoly	254·78	29·570	−·001	29·758	29·658	29th	29·490	11th & 12th	·168	83·4	98·7	+1·7	78·9	+1·6	88·8	+1·7	19·8	102·1	3 days	74·4	2nd	27·7
	Madras	22	29·766	0	29·720	29·863	29th	29·669	11th	·194	85·9	99·2	+4·0	80·5	+2·0	89·9	+3·0	18·7	104·0	16th	75·0	1st	29·0
Madras, East Coast (Central).	Nellore	70·82	29·673	?	29·680	29·773	29th	29·570	11th	·203	86·0	98·3	?	80·8	?	89·6	?	17·5	103·8	3 days	75·1	3rd	28·7
	Masulipatam	15·0	29·696	−·012	29·647	29·819	29th	29·612	20th	·207	82·1	92·8	+0·6	77·9	−0·1	85·4	+0·3	14·9	100·2	30th	73·6	11th	26·6
Madras, Central	Cuddapah	433·36	29·349	?	29·722	29·437	29th	29·254	20th	·183	84·2	95·7	?	78·7	?	87·2	?	17·0	101·2	15th	70·6	10th	30·6
	Kurnool	923·45	28·837	?	29·704	28·931	29th	28·735	20th	·196	80·7	91·7	?	75·4	?	83·6	?	16·3	97·0	15th	71·4	20th	25·6
	Bellary	1,474·63	28·305	+·004	29·725	28·390	8th	28·207	20th	·183	79·6	90·5	−0·5	75·0	+0·8	82·8	+0·2	15·5	94·9	3 days	72·9	14th	22·0
Madras, East Coast (North).	Rajahmundry	112	29·573	?	29·623	29·706	29th	29·488	12th	·218	81·1	89·3	?	77·1	?	83·2	?	12·2	98·0	16th	74·1	20th	23·9
	Cocanada	26	29·650	?	29·613	29·792	29th	29·563	11th	·229	80·6	89·3	?	76·4	?	82·8	?	12·9	96·4	9th & 15th.	72·1	20th	24·3
	Vizagapatam	31	29·605	−·021	29·576	29·776	29th	29·476	11th	·300	83·1	87·3	−0·3	80·3	−0·2	83·8	−0·3	7·0	91·9	31st	77·9	26th & 27th.	14·0
	Gopalpur	21·45	29·565	−·022	29·528	29·744	29th	29·444	11th	·300	82·0	85·3	−0·5	80·4	+0·2	82·9	−0·2	4·9	92·2	31st	77·8	12th	14·4
Hill Stations		...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Beluchistan	Quetta	5,502·28	24·440	+·026	?	24·550	18th	24·320	15th	·230	76·8	91·9	−0·6	60·9	−4·7	76·4	−2·7	31·0	99·1	24th	51·9	4th	47·2

I —*continued.*

in India, Burma, &c., in July 1891 —continued.

Wind direction. Number of winds from: Calm.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	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 1891.	Normal rainfall for period 1st June to 31st July.	Variation from normal of period.	Station.	Meteorological Province or District.
...	...	...	...	...	...	6	23	2	11	8	+38	82	·779	9·0	12	...	...	9·58	9·82	−0·24	14·90	16·12	−1·22	Khandwa	Central Provinces (West).
...	...	...	...	...	4	18	9	...	8	4	+100	87	·861	9·1	16	...	...	15·48	19·53	−4·05	16·14	27·96	−11·82	Hoshangabad.	
1	...	...	...	...	3	13	13	1	12	8	+50	82	·811	8·6	20	...	...	19·79	15·43	+4·36	19·80	25·17	−5·37	Nagpur.	
1	...	1	...	...	1	14	9	5	5*	6	−17	86	·810	7·0	24	...	...	31·86	17·40	+14·46	34·06	28·90	+5·16	Seoni	Central Provinces (Central).
4	1	...	1	1	1	3	17	3	3	5	−40	88	·839	8·8	22	...	...	24·30	21·73	+2·57	26·93	31·71	−4·78	Jubbulpore.	
...	3	...	...	...	1	10	14	3	8	5	+60	85	·808	7·1	18	...	...	19·42	14·86	+4·56	20·93	21·18	−0·25	Saugor.	
...	...	...	...	...	2	17	11	1	13	12	+8	87	·835	9·5	17	...	...	20·45	16·92	+3·53	22·49	28·46	−5·97	Raipur	Central Provinces (East).
...	...	...	...	...	...	8	19	4	15	13	+15	77	·685	8·3	10	...	...	4·07	7·15	−3·08	4·95	11·83	−6·88	Secunderabad	Hyderabad (South).
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...	28·19	31·21	+0·96	..	...	...	**West Coast.**	
...	...	...	...	1	1	13	15	1	18	19	−5	86	·922	9·2	23	...	...	32·72	27·87	+4·85	46·47	47·78	−1·31	Bombay	Konkan.
...	...	...	1	...	...	19	10	1	13	13	0	85	·886	8·3	26	...	...	55·85	33·80	+22·05	65·36	64·76	+0·60	Ratnagiri.	
1	...	...	...	...	...	...	26	1	13	?	?	89	·895	7·6	23	...	...	23·95	?	?	39·81	?	?	Mormugao.	
4	1	...	...	...	...	20	3	3	4	?	?	85	·858	7·1	23	...	...	31·50	37·17	−5·67	48·42	75·76	−27·34	Karwar.	
6	...	...	1	1	1	7	13	2	3	3	0	92	·892	9·3	27	...	...	26·96	36·26	−9·30	62·11	72·55	−10·44	Mangalore	Malabar.
9	2	4	3	1	2	1	3	6	7	?	?	91	·828	8·5	26	...	...	25·95	29·79	−3·84	55·46	63·76	8·30	Calicut.	
10	1	5	1	...	2	2	5	5	5	?	?	87	·832	8·2	24	...	...	20·02	22·36	−2·34	43·94	51·86	−7·92	Cochin.	
...	17	6	...	...	...	..	...	8	11	?	?	87	·802	9·1	14	...	...	8·55	?	?	27·12	?	?	Trivandrum.	
...	...	...	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...	5·10	5·91	−0·53	...	...	...	**South India.**	
1	...	...	...	...	8	18	4	...	11	?	?	73	·806	3·2	0	...	...	0	?	?	0	?	?	Pamban.	Madras, South.
2	...	...	...	...	...	11	4	14	3	5	−40	56	·670	4·2	0	...	...	0	1·04	−1·04	2·12	2·23	−0·11	Madura	
1	...	...	...	1	16	13	...	...	4	5	−20	75	·740	5·5	4	...	..	1·04	3·53	−2·49	5·50	7·13	−1·63	Salem	Madras, South (Central).
...	...	...	...	...	7	15	9	...	6	8	−25	82	·741	6·9	5	...	...	1·75	1·34	+0·41	2·14	2·90	−0·76	Coimbatore.	
...	...	...	...	...	...	4	27	...	8	11	−27	94	·586	9·7	27	...	...	53·11	43·90	+9·21	65·31	72·57	−7·26	Mercara	Coorg.
...	...	...	...	...	1	16	14	...	9	9	0	83	·607	8·0	7	...	...	3·15	4·68	−1·53	11·77	7·41	+4·36	Bangalore	Mysore.
...	...	...	...	...	1	12	16	2	2	7	−71	61	·729	5·5	2	...	...	0·84	1·48	−0·64	0·96	3·35	−2·39	Negapatam	Madras, East Coast (South).
...	...	...	...	...	2	6	15	8	3	?	?	68	·837	4·0	1	...	...	0·35	2·60	−2·25	0·79	3·98	−3·19	Cuddalore.	
...	...	...	...	...	1	7	18	5	13	10	+30	61	·700	7·6	1	...	...	0·26	1·52	−1·26	0·72	3·03	−2·31	Trichinopoly.	
...	...	...	...	...	2	9	18	2	10	8	+25	62	·773	7·9	2	...	...	0·78	3·91	−3·13	0·98	6·36	−5·38	Madras.	
...	...	...	...	...	3	13	3	12	11	?	?	65	·799	8·2	7	...	...	1·51	2·17	−0·66	1·55	3·62	−3·07	Nellore	Madras, East Coast (Central).
1	...	...	...	...	...	1	17	12	5	10	−100	82	·893	8·6	9	...	...	6·57	5·69	+0·88	9·47	10·91	−1·44	Masulipatam.	
...	1	...	...	...	...	3	19	8	?	?	. ?	61	·712	7·5	5	...	...	2·78	2·73	+0·05	4·08	6·35	−2·27	Cuddapah.	Madras (Central).
12	...	...	...	...	...	9	10	...	?	?	?	70	·739	8·1	6	...	...	3·30	4·41	−1·11	4·37	8·26	−3·89	Kurnool.	
1	...	...	...	...	...	1	26	3	14	12	+17	71	·712	8·1	3	...	...	0·60	1·96	−1·36	2·56	3·55	−0·99	Bellary.	
6	...	...	...	..	...	2	21	2	?	?	?	81	·880	7·9	15	...	...	5·84	7·06	−122	6·62	11·74	−5·12	Rajahmundry	Madras, East Coast (North).
...	...	...	...	...	...	9	21	1	9	?	?	77	·794	7·9	13	..	...	8·15	5·39	+2·76	9·11	9·74	−0·63	Cocanada.	
...	...	...	...	...	3	11	12	5	5	4	+25	72	·821	8·6	7	...	...	3·74	4·91	−1·17	6·91	8·69	−1·78	Vizagapatam.	
1	...	...	...	...	5	23	1	1	18	11	+64	86	·931	6·0	5	...	...	3·04	8·03	−4·99	3·52	15·03	−11·51	Gopalpur.	
...	...	...	...	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	**Hill Stations.**	
31	...	...	...	...	...	...	...	...	1	5	−80	47	·441	0·1	0	...	...	0	0·63	−0·		0·73	−0·73	Quetta	Beluchistan.

* Mean of 29 days.

Tabl

Abstract of Observations taken at 8 A.M., at 159 Station

Meteorological Province or District.	Station.	Height of Station 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.
Northern India	Murree	6,343·86	23·724	+·019	?	23·806	29th	23·620	6th	·186	72·7	82·6	+5·2	66·2	+3·3	74·5	+4·3	16·4	95·2	22nd	56·3	26th	38·9
	Simla	7,274	22·920	−·007	?	23·008	12th	22·835	6th	·173	66·0	75·4	+3·3	62·6	+2·0	69·0	+2·7	12·8	85·3	11th & 12th	58·3	26th	27·0
	Mussoorie	?	23·424	?	?	23·504	18th	23·324	10th	·180	65·7	73·9	+4·3	59·0	−1·8	66·5	+1·3	14·9	86·3	11th	53·9	2 days	32·4
	Ranikhet	6,068·75	23·901	−·043	?	23·987	12th	23·789	6th	·198	68·6	76·7	+3·1	64·8	+2·1	70·8	+2·6	11·9	85·5	11th	60·5	3rd	25·0
	Darjeeling	7,421·1	22·853	−·029	?	22·953	12th	22·716	6th	·237	52·3	66·5	+0·2	57·4	+0·1	62·0	+0·2	9·1	70·1	21st	54·6	27th	15·5
	Kalimpong	?	25·806	?	?	25·952	13th	25·621	9th	·331	70·5	75·8	?	67·8	?	71·8	?	8·0	80·1	20th	65·7	23rd, 27th & 29th.	14·4
Central India	Mount Abu	3,945	25·807	−·023	?	25·902	13th	25·683	28th	·219	68·6	78·0	+2·8	66·0	+0·4	72·0	+1·6	12·0	84·2	23rd	63·8	10th & 11th.	20·4
	Pachmarhi	3,511	26·216	−·017	?	26·333	17th	26·022	27th	·311	70·7	78·2	+2·9	68·8	+1·1	73·5	+2·0	9·4	86·7	1st	65·2	6th	21·5
South India	Wellington	6,200	24·205	+·010	?	24·271	29th	24·146	20th	·125	64·2	71·1	+0·3	57·4	−0·8	64·3	−0·3	15·7	76·7	14th	54·1	26th	22·6
Extra India		...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Persia	Meshed	?	?	?	?	?	?	?	?	?	75·4	89·8	?	66·9	?	78·4	?	22·9	95·0	21st & 22nd.	60·0	9th & 26th	35·0
	Bushire	14	29·483	?	29·451	29·639	12th	29·365	24th	·274	91·3	96·5	?	84·6	?	90·6	?	11·9	109·5	18th	79·9	18th	29·6
Arabia	Baghdad	?	29·183	?	?	29·283	4th	29·002	25th	·281	90·2	107·6	?	80·0	?	93·8	?	27·6	118·3	16th	73·7	27th & 31st.	44·6
	Aden	94·1	29·635	?	29·659	29·734	4th	29·532	21st	·202	85·7	91·9	?	81·5	?	86·7	?	10·4	95·8	22nd	74·7	29th	21·1
	Perim	?	29·542	?	?	29·635	4th	29·401	3rd	·234	89·8	97·9	?	?	?	?	?	?	104·3	27th	?	?	?
Arabian Sea Islands.	Minicoy	10·5	29·925	?	29·860	30·009	8th	29·865	2nd	·144	80·7	84·0	?	78·5	?	81·3	?	5·5	86·1	29th	73·4	1st	12·7
Africa	Zanzibar	73	30·125	?	30·126	30·180	9th	30·071	3rd	·109	74·0	79·9	?	72·7	?	76·3	?	7·2	81·4	23rd	70·1	11th	11·3

I —*concluded.*

in India, Burma, &c., in July 1891 —concluded.

Wind Direction. Number of Winds from									Wind Velocity.			Hygrometry, 8 A.M.		Mean cloud amount.	Rainfall.								Station.	Meteorological Province or 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 31st July 1891.	Normal rainfall for period, 1st June to 31st July.	Variation from normal of period.	
10	3	2	2	8	2	...	...	4	7	6	+17	50	·389	3·5	7	...	...	2·76	9·65	−6·89	5·22	12·16	−6·94	Murree	Northern India.
14	3	3	4	2	2	...	3	...	?	2	?	75	·479	7·3	14	...	...	10·57	17·46	−6·89	11·53	24·56	−13·03	Simla.	
...	3	2	6	1	2	1	2	14	?	9	?	86	·546	7·5	11	...	...	12·61	31·23	−18·62	16·12	39·11	−22·99	Mussoorie	
14	...	...	2	...	4	4	7	...	2	2	0	81	·562	6·7	14	...	...	9·99	13·31	−3·32	14·23	18·89	−4·66	Ranikhet.	
5	...	7	10	7	1	1	...	...	4	3	+33	96	·539	8·9	27	...	...	27·11	29·46	−2·35	41·60	54·00	−12·40	Darjeeling.	
7	...	3	2	6	2	2	4	5	?	?	?	97	·721	7·0	22	...	...	20·40	?	?	26·71	?	?	Kalimpong.	
1	...	4	...	...	...	12	10	4	11	11	0	91	·635	8·9	15	...	...	26·00	23·16	+2·84	27·52	27·96	−0·44	Mount Abu	Central India.
...	1	...	...	...	2	11	16	1	11	9	+22	89	·674	9·6	22	...	...	33·71	27·64	+6·07	34·32	38·22	−3·90	Pachmarhi.	
4	1	...	...	...	4	17	2	3	5	5	0	70	·424	7·4	6	...	...	2·17	3·03	−0·86	6·32	6·31	+0·01	Wellington .	South India.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...	...	...	...	**Extra India.**	
12	2	4	...	1	2	...	3	7	?	?	?	?	?	0·6	0	...	...	0	?	?	0	?	?	Meshed .	Persia.
...	6	1	2	2	1	4	3	12	7	9	−22	63	·913	0	0	...	...	0	0	0	0	0	0	Bushire.	
...	11	4	3	1	...	...	9	3	?	?	?	40	·555	0	0	...	...	0	?	?	0	?	?	Baghdad .	Arabia.
10	...	...	...	1	8	11	1	...	11	10	+10	71	·874	2·3	0	...	...	0	0·01	−0·01	0·70	0·01	+0·69	Aden.	
...	5	...	2	1	1	3	18	1	15	?	?	75	1·046	3·1	0	...	...	0	?	?	...	...	...	Perim.	
...	...	...	...	...	6	19	5	1	21	?	?	83	·869	5·9	13	...	...	6·17	?	?	...	...	...	Minicoy .	Arabian Sea Islands
...	...	...	...	1	17	10	1	...	?	8	?	87	·728	5·1	4	..	...	2·37	?	?	...	...	...	Zanzibar .	Africa.

Table

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

Station.	Pressure. Mean of 10 hours.	Mean of 16 hours.	Mean daily range.	Mean daily pressure.	Variation from normal.	Mean reduced to S. L. and to 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.
Murree	23·738	23·713	·024	23·723	+·026	?	82·6	66·5	16·1	95·0	57·2	37·8	76·2	79·3	73·9	+4·7	55·8	61·3	61·9	59·7
Chamba	26·613	·545	·068	26·583	—·031	?	91·7	72·5	19·2	107·2	63·8	43·4	82·8	88·6	80·9	+2·6	66·1	70·5	71·9	69·5
Kailang	20·692	20·628	·064	20·664	+·009	?	72·5	48·4	24·1	82·1	39·3	42·8	64·4	68·4	59·1	—2·4	45·6	54·8	54·0	51·4
Simla	22·929	22·890	·039	22·908	—·016	?	74·9	62·6	12·3	84·3	58·3	26·0	69·0	72·4	68·3	+3·2	57·5	62·2	63·6	61·1
Peshawar	28·393	28·285	·107	28·338	—·024	29·393	106·4	77·1	29·4	115·0	71·9	43·1	96·3	104·0	90·8	+1·2	66·6	74·6	75·6	72·2
Lahore	·776	·679	·097	·727	—·048	·375	103·6	81·7	21·9	117·7	73·5	44·2	95·1	101·9	91·8	+3·7	70·3	76·6	76·4	74·4
Ludhiana	·664	·569	·095	·617	—·070	·368	102·6	83·1	19·5	114·5	75·2	39·3	94·3	99·2	91·6	+5·1	74·4	78·8	79·2	77·5
Mooltan	29·038	·938	·101	·987	—·037	·357	107·9	84·2	23·8	116·7	78·0	38·7	95·6	107·4	95·5	+3·6	72·1	76·7	83·5	77·4
Jacobabad	·272	29·148	·124	29·209	—·026	·345	110·8	84·1	26·7	118·9	3·3	45·6	98·3	108·8	96·6	+2·1	74·2	79·6	79·3	77·7
Hyderabad	·392	·285	·107	·343	—·009	·409	102·3	79·9	22·4	109·2	75·1	34·1	93·9	99·3	89·9	+2·0	74·1	76·6	78·1	76·3
Kurrachee	·507	·436	·072	·476	—·009	·477	90·8	80·3	10·5	93·7	78·6	15·1	87·2	87·8	84·3	+0·4	76·8	79·5	80·0	78·8
Jeypore	28·119	28·023	·096	28·072	—·040	·420	99·1	80·8	18·3	111·3	73·0	38·3	89·7	96·1	88·6	+4·8	73·4	76·8	77·4	75·9
Ajmere	27·952	27·867	·085	27·905	—·048	·436	95·6	79·8	15·7	107·2	72·6	34·6	86·5	93·2	86·1	+4·2	75·1	76·8	78·3	76·7
Mount Abu	25·818	25·761	·057	25·791	—·024	?	77·5	65·9	11·7	84·4	63·5	20·9	71·0	76·4	71·4	+2·8	64·9	68·2	69·6	67·6
Chakrata	23·085	23·042	·044	23·061	—·044	?	72·4	61·2	11·2	83·5	54·5	29·0	67·8	69·1	66·2	+1·6	58·0	62·9	63·7	61·6
Ranikhet	·909	·872	·037	·883	—·046	?	76·3	64·7	11·6	85·3	60·5	24·8	71·7	73·4	70·0	+1·8	61·7	65·9	67·1	64·9
Pithoragarh	24·566	24·508	·058	24·529	—·008	?	80·3	66·5	13·8	89·5	63·9	25·6	74·7	78·2	73·1	+1·2	64·6	69·7	70·3	68·2
Dehra	27·346	27·264	·082	27·298	—·049	·439	88·0	74·7	13·3	99·7	67·1	32·6	81·5	84·9	80·3	+0·5	71·6	74·6	75·8	74·0
Roorkee	28·637	28·527	·110	28·579	—·059	·409	97·4	80·4	17·1	110·9	75·0	35·9	89·2	95·2	88·1	+3·4	74·5	78·2	79·2	77·3
Meerut	·781	·677	·104	·726	—·042	·408	97·8	81·9	16·0	107·2	75·9	31·3	90·3	95·1	89·2	+3·7	77·4	78·8	79·2	78·4
Agra	·966	·882	·085	·922	—·037	·420	100·2	83·6	16·5	111·0	74·5	36·5	93·1	96·6	91·6	+4·6	75·4	79·9	80·5	78·6
Lucknow	29·157	29·043	·114	29·103	—·054	·422	98·1	81·4	16·7	107·8	75·8	32·0	89·8	94·5	88·6	+2·8	77·3	80·0	80·2	79·2
Allahabad	·203	·093	·110	·150	—·060	·405	98·5	81·6	17·0	108·5	76·6	31·9	90·9	95·1	88·9	+4·3	77·4	80·9	81·2	79·8
Ghazipur	·319	·211	·108	·269	—·026	·437	96·5	82·1	14·4	103·9	79·0	24·9	90·1	93·2	88·2	+4·2	77·3	80·9	81·0	79·7
Nowgong	28·771	28·688	·083	28·731	—·046	·427	94·2	80·5	13·7	104·1	75·1	29·0	87·8	89·9	85·8	+3·0	76·0	78·9	79·2	78·0
Sutna	·484	·392	·092	·439	—·048	·416	92·1	78·0	14·1	103·1	72·6	30·5	86·5	88·8	83·9	+2·3	74·5	78·0	78·0	76·8
Durbhunga	29·397	29·298	·099	29·354	—·027	·470	89·9	79·1	10·8	93·6	76·5	17·1	85·1	88·2	83·8	—0·2	77·9	80·2	81·3	79·8
Patna	·350	·248	·102	·306	—·051	·438	90·4	79·4	11·0	94·4	73·6	20·8	86·0	87·9	83·6	—0·7	77·7	80·3	80·8	79·6
Hazaribagh	27·568	27·498	·070	27·541	—·028	·472	84·9	73·4	11·4	90·7	71·2	19·5	79·4	82·4	78·2	0	72·2	74·7	76·1	74·2
Darjeeling	22·869	22·810	·059	22·842	—·020	?	66·6	57·4	9·1	70·3	54·6	15·7	63·6	64·0	61·4	+0·3	56·8	62·6	62·9	60·8
Pedong	25·092	25·021	·071	25·060	—·034	?	75·5	66·4	9·0	80·0	64·1	15·9	72·7	72·3	70·2	+1·0	65·0	70·7	70·4	68·7
Berhampore	29·482	29·394	·088	29·445	—·044	·460	89·1	78·7	10·4	92·7	75·3	17·4	84·3	85·8	82·6	—0·9	77·6	80·4	81·3	79·8
Burdwan	·459	·372	·087	·423	—·034	·467	89·7	79·2	10·5	95·1	76·4	18·7	84·3	85·6	83·0	—0·9	77·6	78·9	79·5	78·7
Calcutta (Alipore)	·530	·452	·078	·497	—·041	·464	88·0	78·7	9·2	94·2	76·2	18·0	84·1	84·6	83·1	+0·1	76·7	79·3	80·0	78·7
Calcutta (Chowringhee)	·534	?	?	?	?	?	89·8	78·7	11·2	95·6	75·8	19·8	85·4	?	?	?	77·6	81·0	?	?
Saugor Island	·534	·453	·081	·500	—·037	·468	87·6	80·3	7·2	91·2	77·7	13·5	84·4	85·0	82·3	0	77·8	80·5	80·8	79·7
Dacca	·560	·475	·085	·527	—·044	·497	87·4	79·3	8·1	91·3	76·7	14·6	83·5	85·0	83·0	—0·3	77·0	80·1	80·6	79·2
Chittagong	·539	·464	·075	·509	—·050	·539	85·5	76·6	8·9	91·5	73·9	17·6	82·7	82·5	79·9	—0·1	75·6	79·0	79·0	77·9
Demagiri	Not recorded.						86·5	77·0	9·4	91·6	75·2	16·4	83·6	84·6	81·3	+1·7	?	?	?	?
Tura							84·9	74·1	10·9	88·2	71·8	16·4	79·5	81·9	78·7	+0·7	?	76·5	77·8	?
Dhubri	·464	·366	·098	·424	—·061	·491	85·6	77·7	7·9	90·6	74·3	16·3	81·1	83·7	80·6	—1·2	76·5	78·3	79·6	78·1
Sibsagar	·276	·146	·130	·215	—·072	·496	91·0	78·8	12·2	96·6	75·5	21·1	85·7	89·7	84·0	+0·7	77·7	81·6	82·9	80·7

II.

at 89 Stations in India, Burma, &c., in July 1891.

Vapour Tension.					Humidity.					Cloud.				Wind Direction. Number of Winds from											Wind Steadiness.		Wind Velocity.		Station.
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.	
·337	·390	·378	·368	—·167	54	46	42	48	—27	3·8	5·4	4·6	—1·7	16	...	1	3	24	8	2	1	3	S 34° E	S 15° E	50	14	195	134	Murree.
·571	·610	·595	·592	—·145	72	58	49	60	—17	5·3	6·6	6·0	—0·6	14	3	1	1	2	...	...	4	37	N 44° W	N 37° W	63	31	101	95	Chamba.
·286	·347	·294	·309	?	83	57	44	61	?	5·0	6·5	5·7	—0·6	...	1	...	...	2	7	25	17	10	S 66° W	S 83° W	71	63	65	40	Kailang.
·427	·491	·499	·472	—·073	76	71	65	71	—18	7·3	7·6	7·5	—1·3	11	4	7	11	4	7	5	11	...	S 35° E	S 63° W	13	25	?	?	Simla.
·532	·589	·532	·551	—·174	57	36	26	40	—12	1·8	2·3	2·1	—0·6	4	9	16	12	6	4	3	1	7	N 53° E	N 56° E	40	47	94	109	Peshawar.
·680	·670	·568	·639	—·220	64	44	33	47	—13	3·5	2·9	3·2	—1·2	6	6	9	12	6	3	4	10	6	N 40° E	S 84° E	13	34	80	79	Lahore.
·744	·781	·734	·754	—·116	67	52	43	54	—16	2·6	4·3	3·5	—2·5	17	7	...	1	7	8	1	13	5	S 75° W	S 46° E	19	25	67	47	Ludhiana.
·627	·686	·831	·708	—·166	54	40	35	43	—16	1·3	1·1	1·2	—1·0	12	...	6	...	7	...	31	...	6	S 43° W	S 25° W	40	33	36	77	Mooltan.
·716	·760	·606	·695	—·119	62	42	26	41	—11	1·6	1·6	1·6	—0·6	12	1	3	3	20	17	3	2	1	S 26° E	S 45° E	52	56	120	125	Jacobabad.
·768	·686	·677	·710	—·092	75	43	36	52	— 9	7·2	7·2	7·2	+4·1	...	...	1	...	...	...	53	1	7	S 53° W	S 41° W	85	75	395	333	Hyderabad.
·876	·903	·922	·910	—·008	85	70	70	77	— 1	5·8	4·6	5·2	—1·9	...	...	...	...	...	...	16	44	2	S 80° W	S 62° W	93	83	438	431	Kurrachee.
·735	·759	·708	·734	—·120	70	56	45	57	—20	5·7	6·4	6·1	—1·3	...	4	6	4	3	...	9	22	14	N 71° W	N 51° W	47	25	165	140	Jeypore.
·814	·804	·782	·800	+·019	81	65	53	66	— 5	4·7	5·1	4·9	—1·4	...	...	6	2	2	2	10	37	3	S 84° W	S 62° W	63	64	259	170	Ajmere.
·608	·661	·648	·633	+·008	95	87	72	83	— 4	8·7	7·4	8·0	—0·8	2	...	5	1	3	1	24	19	7	S 71° W	S 49° W	58	66	268	253	Mount Abu.
·455	·527	·538	·507	—·039	85	79	78	80	—12	6·9	7·4	7·2	—1·6	5	...	4	4	1	1	15	30	2	S 76° W	S 71° W	58	42	131	118	Chakrata.
·522	·580	·599	·566	—·015	86	76	74	79	— 7	6·9	6·8	6·9	—1·8	29	...	1	2	...	2	17	11	...	S 57° W	S 65° W	39	25	59	53	Ranikhet.
·589	·673	·657	·640	—·006	91	79	70	80	— 5	7·3	8·1	7·7	—0·1	37	...	2	...	2	2	19	...	...	S 34° W	S 24° E	31	20	61	52	Pithoragarh.
·740	·775	·782	·766	?	86	73	67	76	?	6·1	5·5	5·8	—2·0	...	5	6	4	11	16	3	5	8	S 16° E	S 37° W	19	10	32	29	Dehra.
·778	·818	·785	·794	—·080	75	61	50	62	—15	5·0	4·4	4·7	—1·8	7	...	...	1	25	15	2	8	4	S 12° E	S 39° E	52	33	92	71	Roorkee.
·883	·832	·782	·832	—·056	82	60	50	64	—10	5·2	5·5	5·4	—1·4	7	1	3	13	17	1	...	17	3	S 46° E	S 86° E	18	23	84	56	Meerut.
·788	·840	·827	·814	—·097	72	55	51	59	—15	6·0	5·6	5·8	—0·8	...	...	2	5	21	1	18	...	15	S 7° W	N 63° E	27	13	174	118	Agra.
·887	·893	·844	·875	—·047	83	65	54	67	— 9	6·3	6·4	6·3	—1·4	1	3	12	20	6	4	8	5	3	S 89° E	N 85° E	32	18	118	94	Lucknow.
·888	·924	·878	·897	—·064	83	64	54	67	—14	7·0	7·2	7·1	—0·6	2	4	11	15	5	...	5	10	10	N 27° E	N 84° E	21	7	232	100	Allahabad.
·880	·940	·898	·906	—·040	80	66	58	68	—11	6·2	5·5	5·8	—1·0	4	1	5	24	9	...	5	10	4	S 82° E	S 63° E	29	22	78	67	Ghazipur.
·839	·870	·850	·853	+·046	81	67	62	71	— 7	7·2	8·2	7·7	—0·8	2	2	5	8	1	4	4	32	4	N 88° W	S 78° W	40	40	163	97	Nowgong.
·811	·855	·826	·830	—·005	85	69	64	73	— 5	5·5	6·3	5·9	—1·1	1	5	4	5	4	7	1	28	7	N 85° W	N 81° W	37	45	282	229	Sutna.
·941	·970	·979	·963	—·008	94	81	74	83	0	6·9	5·6	6·3	+0·1	3	2	6	20	16	1	5	4	5	S 76° E	S 82° E	40	58	127	120	Durbhunga.
·928	·961	·957	·949	—·012	92	78	73	81	— 1	8·2	8·3	8·2	+0·1	1	...	5	37	1	1	5	9	3	N 89° E	N 85° E	42	41	154	89	Patna.
·779	·801	·824	·798	—·022	94	80	75	83	— 2	10·0	9·8	19·9	+0·8	...	3	...	14	7	8	5	15	10	S 46° W	S 16° E	14	19	262	202	Hazaribagh.
·461	·555	·564	·526	+·006	97	95	94	95	0	9·4	8·7	9·0	+0·2	12	1	13	17	13	1	4	1	...	S 85° E	N 88° E	52	43	88	63	Darjeeling.
·603	·729	·724	·686	+·015	93	90	91	91	—2					Imperfect.									?	?	?	?	?	?	Pedong.
·933	·989	1·011	·977	+·015	95	84	82	87	0	8·9	8·8	8·9	+0·1	1	...	4	20	8	12	7	7	3	S 39° E	S 41° E	37	51	125	121	Berhampore.
·831	·917	·927	·925	—·032	92	77	75	82	—1	9·0	8·9	9·0	+0·7	2	1	...	9	12	14	15	8	1	S 3° W	S 26° E	51	47	103	99	Burdwan.
·895	·941	·964	·933	—·040	91	81	81	84	— 3	8·9	8·2	8·6	+0·5	...	4	1	8	14	8	19	5	3	S 4° W	S 11° E	40	65	140	124	Calcutta (Alipore).
·933	1·002	?	?	?	95	83	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	Calcutta (Chowringhee).
·921	·993	·996	·970	—·033	89	84	83	85	— 1	9·0	8·9	9·0	+1·1	...	1	...	4	9	14	25	7	2	S 24° W	S 24° W	63	59	315	341	Saugor Island.
·898	·983	·986	·956	—·027	90	86	82	86	— 1	8·2	7·8	8·0	+0·2	1	...	...	7	24	17	12	1	...	S 19° E	S 19° E	72	80	201	171	Dacca.
·871	·943	·946	·920	+·008	95	85	85	88	+ 1	8·7	9·4	9·0	+1·4	2	...	1	6	18	18	14	2	1	S 10° E	S 40° E	64	63	136	172	Chittagong.
?	?	?	?	?	?	?	?	?	?	4·7	6·7	5·7	+0·8	1	...	...	8	53	...	...	...	...	S 50° E	S 33° E	95	30	?	?	Demagiri.
?	·881	·909	?	?	?	87	8	?	?	7·0	5·5	6·3	—0·7	...	...	6	6	13	10	21	6	...	S 3° W	S 7° W	47	64	?	?	Tura.
·898	·932	·955	·928	—·020	94	88	83	88	+ 2	8·5	8·6	8·5	+1·8	6	1	10	12	6	1	16	2	4	S 52° E	S 70° E	14	22	132	94	Dhubri.
·837	1·026	1·031	·997	+·048	95	84	74	84	0	8·4	7·8	8·1	—0·4	...	...	24	7	6	...	21	2	2	S 86° E	S 18° W	16	15	51	66	Sibsagar.

Table

Abstract of Observations recorded at 10 A.M. and 4 P.M., at 89 Stations

Station.	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 to 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.
Silchar	29·507	29·403	·104	29·465	−·062	29·519	91·1	77·7	13·5	97·0	75·3	21·7	84·8	87·8	83·3	+1·1	76·5	80·2	81·1	79·2
False Point	·564	·489	·075	·531	−·036	·493	87·3	77·8	9·5	93·3	73·6	19·7	84·4	85·1	81·5	−0·4	76·0	79·4	79·8	78·4
Cuttack	·505	·423	·082	·473	−·027	·495	89·9	78·6	11·2	96·4	75·3	21·1	86·1	87·3	83·1	+0·6	75·9	78·3	78·8	77·6
Sambalpur	·094	·003	·091	·057	−·035	·463	87·2	77·4	9·8	94·3	74·3	20·0	82·7	84·4	81·4	+0·2	74·6	78·1	78·8	77·2
Raipur	28·621	28·526	·095	28·574	−·025	·473	86·0	74·2	11·8	96·0	70·3	25·7	81·0	84·0	79·6	0	72·1	76·2	77·1	75·1
Khandwa	·579	·486	·093	·533	−·028	·521	88·0	75·7	12·4	97·2	72·1	25·1	81·7	85·8	80·9	+1·2	72·7	75·2	76·1	74·7
Hoshangabad	·586	·489	·097	·538	−·040	·503	89·4	75·5	13·9	101·2	70·9	30·3	82·0	86·7	81·4	+1·8	73·9	76·9	78·4	76·4
Saugor	27·816	27·731	·086	27·774	−·027	·456	88·3	74·8	13·5	97·9	71·4	26·5	81·7	85·6	80·5	+3·0	72·2	76·5	77·1	75·3
Jubbulpore	28·248	28·156	·092	28·202	−·024	·483	86·8	75·1	11·7	96·0	71·4	24·6	80·6	83·0	79·6	+0·4	73·4	76·0	76·5	75·3
Pachmarhi	26·228	26·155	·073	26·192	−·017	?	77·8	71·9	5·8	87·2	67·4	19·8	72·2	76·0	74·9	+4·5	69·4	69·4	71·1	69·8
Seoni	27·579	27·496	·084	27·537	−·032	·478	84·4	73·1	11·4	95·7	69·6	26·1	79·8	80·6	78·1	+1·9	70·3	74·6	74·8	73·2
Nagpur	28·577	28·474	·102	28·526	−·034	·493	87·9	75·9	12·0	100·6	71·9	28·7	81·9	84·2	81·0	+0·9	71·8	76·3	77·1	75·1
Chanda	29·015	·915	·100	·965	−·016	·539	87·4	76·2	11·2	98·1	71·4	26·7	82·0	85·0	81·2	+0·3	72·8	74·8	75·7	74·4
Sironcha	·269	29·171	·098	29·220	−·058	·563	87·2	76·9	10·3	96·4	71·7	24·7	82·1	84·8	81·5	0	74·0	76·5	78·0	76·1
Chikalda	26·097	26·035	·062	26·066	−·037	?	74·8	66·3	8·5	83·2	62·9	20·3	69·5	73·1	70·6	+0·8	65·8	67·9	69·3	67·6
Buldana	27·539	27·458	·081	27·498	−·031	·550	82·7	70·8	11·9	92·4	66·8	25·6	78·2	79·7	76·0	−0·3	68·1	71·9	72·3	70·8
Akola	28·717	28·623	·094	28·670	−·021	·544	88·6	74·3	14·3	97·9	69·8	28·1	82·6	85·1	80·6	+0·3	72·0	75·1	75·8	74·3
Makhla			Not re	corded.			77·6	68·8	8·8	86·9	67·2	19·7	71·7	75·0	72·6	+1·0	67·9	69·3	70·8	69·3
Deesa	29·116	29·011	·105	29·065	−·033	·474	96·9	78·8	18·1	105·7	73·8	31·9	86·9	94·8	87·3	+3·4	75·1	76·9	77·9	76·6
Bombay	·687	·626	·061	·667	−·001	·606	84·4	77·8	6·7	88·4	73·7	14·7	81·7	81·4	80·9	0	75·3	78·1	77·9	77·1
Poona	27·892	27·835	·057	27·865	−·008	·639	83·6	71·2	12·4	91·6	68·3	23·3	78·9	78·5	75·9	+0·9	69·0	72·1	71·5	70·9
Sholapur	28·147	28·048	·099	28·106	−·015	·625	91·1	72·7	18·4	99·7	69·8	29·9	82·6	87·1	79·9	+1·9	70·1	72·4	73·0	71·9
Ratnagiri	29·679	29·616	·062	29·645	+·002	·692	83·8	74·1	9·7	88·0	72·2	15·8	81·3	81·2	78·8	−0·8	72·1	77·4	77·6	75·7
Karwar	·804	·750	·053	·775	+·012	·748	83·5	76·1	7·4	86·2	72·7	13·5	81·1	80·8	79·6	+1·1	74·0	77·3	77·0	76·1
Belgaum	27·271	27·217	·054	27·243	−·008	·693	75·6	67·2	8·4	82·1	65·0	17·1	72·7	72·3	70·3	+0·2	65·9	69·8	69·2	68·3
Secunderabad	·936	·838	·098	·896	−·023	·609	87·2	72·3	14·9	96·3	68·4	27·9	80·1	84·2	78·0	+1·1	69·7	72·7	73·7	72·0
Vizagapatam	29·613	29·526	·087	29·576	−·016	·544	87·5	80·3	7·2	93·5	77·8	15·7	85·3	87·4	85·1	−0·1	73·3	77·3	77·7	76·1
Bellary	28·308	28·216	·092	28·271	−·010	·656	90·5	75·0	15·5	94·9	72·8	22·1	83·8	86·9	80·9	+0·3	70·2	74·0	74·3	72·8
Madras*	29·686	29·724	·123	29·723	+·001	·675	99·3	80·6	18·7	104·3	75·2	29·1	96·0	84·3	86·6	+1·3	?	78·3	78·2	77·1
Salem	28·917	28·799	·118	28·872	−·010	·741	94·5	74·0	20·5	99·4	70·8	28·6	85·2	90·1	82·4	+1·8	71·3	74·5	76·1	74·0
Mercara	26·190	26·124	·066	26·157	−·007	·821	68·8	62·9	5·9	76·3	60·7	15·6	65·5	65·8	64·7	−0·3	61·4	64·4	64·7	63·5
Trichinopoly	29·576	29·460	·116	29·531	+·001	·734	98·8	78·9	19·9	102·1	74·6	27·5	90·2	94·6	87·0	+1·6	74·0	74·7	75·7	74·8
Cochin	·925	·858	·067	·889	+·018	·827	83·9	74·6	9·3	87·1	71·6	15·5	80·1	81·0	79·0	+0·4	73·0	76·0	76·7	75·2
Wellington	24·218	24·157	·061	24·188	+·021	?	71·0	57·5	13·5	76·9	52·9	24·0	66·3	65·5	63·1	−0·1	53·8	59·6	59·0	57·5
Akyab	29·662	29·585	·077	29·627	−·044	·589	84·5	79·1	5·4	91·2	75·5	15·7	81·1	81·1	80·6	+0·6	74·0	79·0	78·8	77·2
Diamond Island	·736	·667	·069	·708	−·029	·684	84·4	72·2	12·2	87·8	68·8	19·0	81·5	81·1	77·0	−1·5	72·0	78·0	77·4	75·7
Rangoon	·734	·658	·076	·702	−·035	·681	91·5	74·9	16·7	102·0	72·1	29·9	80·0	78·8	79·3	+1·1	73·4	77·8	76·7	76·0
Mergui	·762	·684	·078	·730	−·016	·757	83·1	69·8	13·3	89·6	66·5	23·1	80·4	79·5	75·6	−1·7	68·2	77·1	76·4	73·9
Cocos Island	·689	·622	·064	·663	?	·706	84·9	?	?	89·0	?	?	81·9	82·0	?	?	?	78·6	78·4	?
Port Blair	·771	·702	·070	·744	−·001	·735	85·7	79·1	6·6	88·9	75·6	13·3	83·7	83·5	81·4	+1·2	75·3	78·9	78·6	77·6
Quetta	24·439	24·366	·073	24·400	+·013	?	92·2	60·8	31·4	99·2	51·5	47·7	84·9	91·3	76·5	−1·6	54·5	62·5	61·3	59·4
Leh	19·660	19·564	·096	19·621	+·021	?	75·1	47·6	27·5	86·3	41·6	44·7	64·0	71·1	59·2	−2·1	40·9	50·0	52·7	47·9
Katmandu	25·426	25·353	·073	25·392	−·010	?	90·5	68·1	22·4	96·8	66·2	30·6	77·8	79·1	76·5	+0·5	67·3	71·9	72·8	70·7
Minicoy	29·940	29·873	·067	29·914	?	·849	84·0	78·5	5·5	86·1	73·4	12·7	82·1	81·7	81·2	?	75·5	77·5	77·7	76·9
Aden	·642	·511	·131	·577	+·016	·601	91·0	81·1	9·9	94·1	73·7	20·4	86·9	89·9	85·8	−0·4	73·7	78·6	77·2	76·5
Perim	·540	·432	·109	·486	?	?	97·6	88·1	9·7	104·3	84·7	19·6	93·5	93·8	91·9	?	?	83·4	82·9	?
Zanzibar	30·134	30·042	·090	30·089	?	30·089	79·9	72·7	7·2	81·4	70·1	11·3	75·6	78·4	75·9	?	69·5	72·1	71·4	71·1

* The hours of observations are 14 hours and 20 hours (in case of winds 12 hours

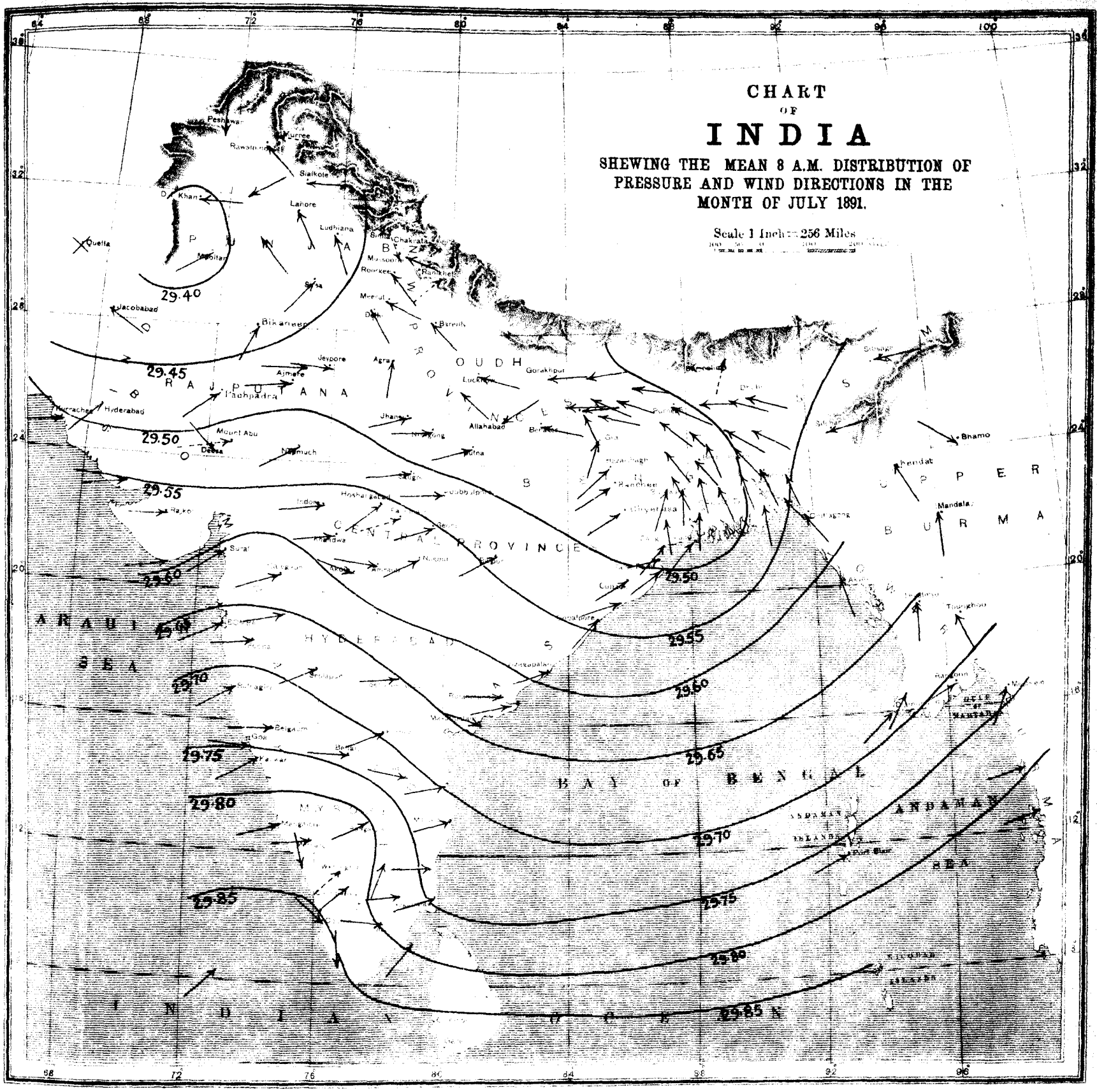
II —*continued.*

in India, Burma, &c., in July 1891 —continued.

Vapour Tension.					Humidity.					Cloud.				Wind Directions. Number of Winds from											Wind Steadiness.		Wind Velocity.		Station.
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.	
·898	·970	·976	·948	+·014	95	82	75	84	0	8·9	8·9	8·9	+1·1	26	1	6	3	5	5	3	8	5	S 58° W	N 6° W	5	3	31	72	Silchar.
·875	·942	·948	·921	—·012	92	80	79	83	—2	9·1	8·7	8·9	+0·9	...	2	...	1	2	18	22	14	3	S 43° W	S 59° W	69	64	305	263	False Point.
·859	·865	·873	·866	—·036	88	70	69	76	—4	8·5	8·7	8·6	+1·0	6	...	5	1	2	3	19	20	6	S 72° W	S 44° W	53	52	93	77	Cuttack.
·822	·901	·913	·879	—·022	87	81	78	82	—1	9·0	8·5	8·7	+1·5	...	1	...	2	1	2	35	18	3	S 60° W	S 50° W	79	45	80	89	Sambalpur.
·762	·839	·834	·812	—·018	90	80	74	81	—1	9·5	9·5	9·5	+1·2	4	...	2	...	...	3	30	22	1	S 62° W	S 68° W	77	77	308	278	Raipur.
·770	·790	·780	·780	—·002	87	73	65	75	—2	8·8	7·6	8·2	+0·3	...	..	...	...	...	3	11	44	4	S 82° W	N 83° W	89	80	266	205	Khandwa.
·818	·859	·869	·849	+·018	93	79	71	81	—2	8·8	8·4	8·6	+0·5	2	...	...	...	...	8	29	22	1	S 57° W	S 76 W	84	77	191	167	Hoshangabad.
·762	·850	·827	·813	+·042	89	79	69	79	0	6·8	7·6	7·2	+0·8	...	4	5	1	...	2	21	22	9	S 86° W	S 72° W	60	70	181	123	Saugor.
·803	·826	·835	·821	+·004	93	81	76	83	+1	8·4	8·0	8·2	—0·4	5	1	1	1	2	5	9	28	10	S 84° W	N 87° W	63	65	69	118	Jubbulpore.
·690	·689	·709	·696	+·024	88	88	80	85	—5	9·1	8·6	8·8	0	...	1	...	1	...	8	31	18	3	S 57° W	N 80° W	79	75	394	227	Pachmarhi.
·707	·792	·790	·763	+·012	87	79	77	81	0	7·0	7·7	7·4	+2·5	...	4	2	2	...	1	22	24	7	S 81° W	S 78° W	67	57	118	148	Seoni.
·731	·836	·843	·803	—·010	82	78	75	78	—2	9·0	9·0	9·0	+0·3	...	...	...	1	1	8	21	26	5	S 65° W	N 88° W	76	69	297	189	Nagpur.
·764	·767	·762	·764	—·039	85	71	66	74	—3	8·8	8·7	8·7	+0·1	...	...	...	...	...	2	32	27	1	S 65° W	S 88° W	90	70	151	151	Chanda.
·801	·837	·866	·834	—·002	87	77	75	80	0	9·0	8·6	8·8	+1·1	16	1	...	...	...	6	19	16	4	S 64° W	S 79° W	58	83	85	101	Sironcha.
·629	·665	·674	·643	—·012	97	92	84	86	—6	9·4	8·9	9·2	+0·1	5	7	...	...	1	2	3	15	29	N 58° W	N 58° W	69	67	286	228	Chikalda.
·656	·707	·704	·690	—·026	87	74	72	78	—2	8·7	8·7	8·7	+0·7	...	2	...	...	...	...	10	29	21	N 79° W	N 82° W	84	73	248	223	Buldana.
·758	·772	·768	·767	+·002	90	71	67	75	0	9·4	9·7	9·5	+0·9	...	...	2	...	...	...	9	24	27	N 74° W	N 74° W	81	77	285	198	Akola.
?	?	?	?	?	?	?	?	?	?	9·9	9·3	9·6	+0·8	...	6	1	...	...	1	11	12	31	N 63° W	S 80° W	74	58	?	?	Makhla.
·821	·792	·731	·774	—·020	84	63	47	61	—13	8·3	8·0	8·2	+0·1	...	10	5	2	...	...	...	11	32	N 38° W	S 40° W	74	75	398	347	Deesa.
·848	·917	·913	·893	—·019	89	85	85	86	—1	9·2	9·4	9·3	+0·2	...	...	1	...	...	1	24	34	2	S 73° W	S 75° W	87	84	435	454	Bombay.
·682	·703	·686	·693	—·004	89	72	72	78	—2	8·6	8·7	8·6	—0·4	...	..	...	...	...	...	16	44	2	S 80° W	S 79° W	92	85	399	403	Poona.
·707	·670	·636	·681	+·037	88	60	51	67	—1	8·7	9·0	8·8	+0·5	...	...	...	...	1	...	38	21	2	S 62° W	S 80° W	89	81	532	293	Sholapur.
·762	·888	·898	·847	—·013	90	83	85	86	+1	7·9	8·2	8·0	+0·4	...	...	...	...	...	1	33	25	3	S 66° W	S 55° W	89	77	331	315	Ratnagiri.
·815	·885	·880	·856	+·026	91	83	84	85	—2	7·1	8·1	7·6	—0·1	...	1	...	...	...	...	41	12	8	S 64° W	S 74° W	82	80	101	?	Karwar.
·623	·694	·678	·668	—·001	93	87	86	90	+1	9·4	9·3	9·3	+0·3	...	...	...	...	...	13	40	7	...	S 41° W	S 70° W	87	90	770	669	Belgaum.
·693	·710	·703	·702	+·022	88	69	62	73	0	7·9	7·8	7·9	+0·8	...	...	...	...	...	...	9	40	13	N 87° W	S 75° W	90	85	356	319	Secunderabad.
·722	·832	·822	·792	—·061	70	68	63	67	—4	8·4	8·5	8·5	+1·7	...	...	...	...	...	9	31	18	4	S 7° W	S 74° W	82	74	115	94	Vizagapatam.
·680	·717	·691	·696	+·040	78	62	55	65	+2	8·2	9·0	8·6	+0·4	...	...	...	...	...	...	3	52	7	N 87° W	S 88° W	95	89	333	280	Bellary.
?	·729	·882	·802	+·022	?	44	76	64	—2	7·6	8·0	7·8	+0·7	...	...	...	...	5	11	28	17	1	S 45° W	S 46° W	77	65	226	197	Madras.*
·730	·713	·714	·719	—·024	87	59	52	66	—5	5·6	7·6	6·6	+0·5	...	...	...	1	3	29	23	4	2	S 22° W	S 59° W	81	82	99	110	Salem.
·530	·593	·600	·574	—·009	92	94	94	93	—3	9·4	9·6	9·5	—0·3	...	...	..	...	...	...	5	56	1	S 87° W	N 79° W	97	91	196	261	Mercara.
·776	·650	·635	·687	—·012	79	46	40	55	—3	6·8	7·0	6·9	—0·7	...	...	...	...	...	...	17	34	11	S 86° W	S 89° W	87	79	318	239	Trichinopoly.
·794	·846	·865	·835	+·003	93	82	81	85	—3	6·9	7·6	7·3	0	10	...	6	1	...	...	4	19	22	N 62° W	S 88° W	58	51	113	?	Cochin.
·379	·441	·433	·418	—·007	80	69	70	73	—1	8·0	8·7	8·4	+0·7	3	2	...	...	2	1	46	6	2	S 51° W	N 82° W	81	69	123	129	Wellington.
·773	·965	·956	·898	+·018	77	91	90	86	—3	9·2	9·0	9·1	+0·6	...	3	3	3	6	31	13	1	2	S 3° W	S 4° E	61	68	117	94	Akyab.
·784	·912	·894	·860	—·020	98	85	84	89	+1	9·2	9·4	9·3	+1·5	...	...	...	...	...	10	37	14	1	S 49° W	S 41° W	87	80	217	212	Diamond Island.
·804	·927	·896	·875	—·013	93	91	91	92	+3	9·1	9·4	9·2	+0·3	...	1	...	...	...	7	32	17	2	S 57° W	S 29° W	79	73	153	131	Rangoon.
·672	·890	·870	·811	—·031	92	86	87	88	—1	9·4	9·5	9·4	+0·3	...	1	...	...	...	...	40	15	6	S 64° W	S 60° W	85	61	52	43	Mergui.
?	·936	·924	?	?	?	86	85	?	?	9·3	9·5	9·4	?	...	...	...	...	...	18	41	2	...	S 33° W	?	92	?	?	?	Cocos Island.
·828	·924	·912	·888	·—012	83	80	79	81	—5	8·8	8·9	8·8	+1·6	...	...	...	...	...	...	41	20	...	S 59° W	S 44° W	93	89	395	255	Port Blair.
·366	·335	·234	·312	—·156	67	28	14	36	—13	0·3	1·3	0·8	—0·8	56	...	...	...	...	...	...	3	3	N 66° W	W	10	34	37	111	Quetta.
·201	·242	·242	·228	—·018	61	41	33	45	+1	4·4	5·4	4·9	—0·1	9	1	4	4	...	8	16	17	3	S 60° W	S 80° W	43	36	29	48	Leh.
·661	·718	·835	·704	+·015	96	76	75	82	+3	6·7	8·1	7·4	+1·1	3	6	3	14	8	5	1	12	10	N 30° E	S 72° W	6	53	24	?	Katmandu.
·842	·883	·896	·874	?	86	81	83	83	?	6·1	7·2	6·7	?	...	...	...	...	...	6	42	13	1	S 51° W	?	90	?	492	?	Minicoy.
·734	·871	·765	·790	—·022	70	68	55	64	—2	1·7	1·2	1·5	—0·8	3	...	...	1	10	34	14	...	...	S 2° W	S 11° E	82	73	271	243	Aden.
?	1·013	·980	?	?	?	65	62	?	?	2·7	1·6	2·2	?	...	14	...	7	...	2	1	32	6	N 63° W	?	53	?	481	?	Perim.
·679	·743	·677	·703	?	84	84	70	80	?	3·7	5·7	4·8	?	...	...	...	...	14	22	9	7	...	S 5° W	S 2° W	76	64	?	183	Zanzibar.

and 24 hours), and the means are as given in the registers sent by the Government Astronomer, Madras.

GOVERNMENT OF INDIA CENTRAL PRINTING OFFICE.—No. 95 METEO.—7-3-92.—400.



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.

Reg No. 763, Wr., I.—Feb. 92.—415.

Photo-litho., S. I. O., Calcutta.

Explanation.

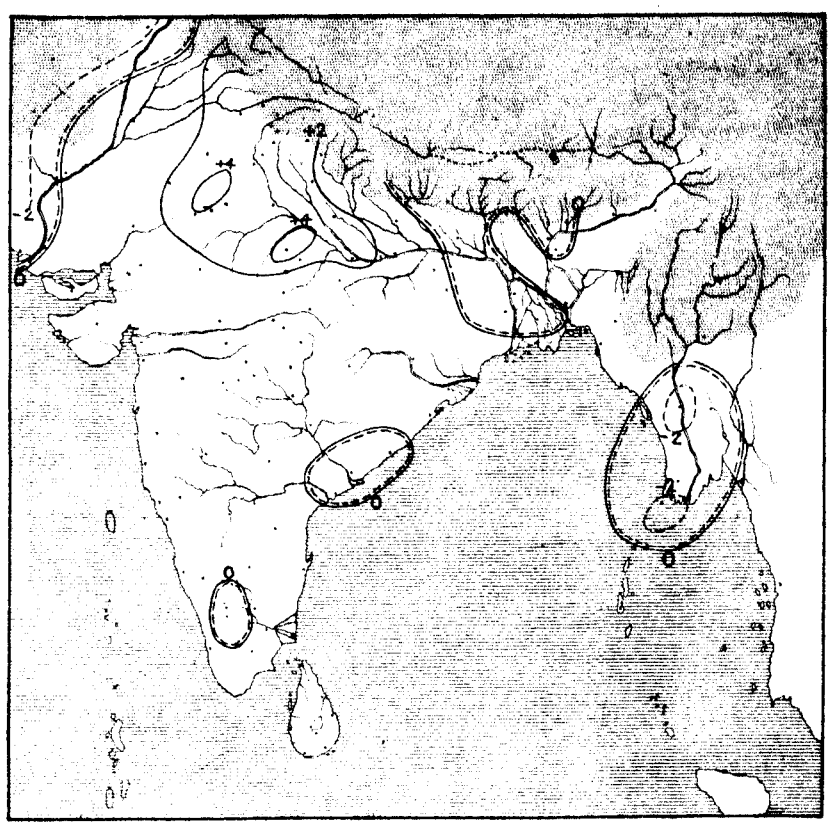
The Chart shows the variation of the mean 8 a.m. pressure of the month from the normal by means of lines drawn for equal amounts of variation (of two hundredths of an inch or ·020″). The numbers are given in thousandths of an inch, 20 representing ·020″ or two hundredths of an inch, &c. Continuous lines 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.

No. 752, Wr., I.—Feb. 92.—415.

Photo-litho., S. I. O., Calcutta.

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.



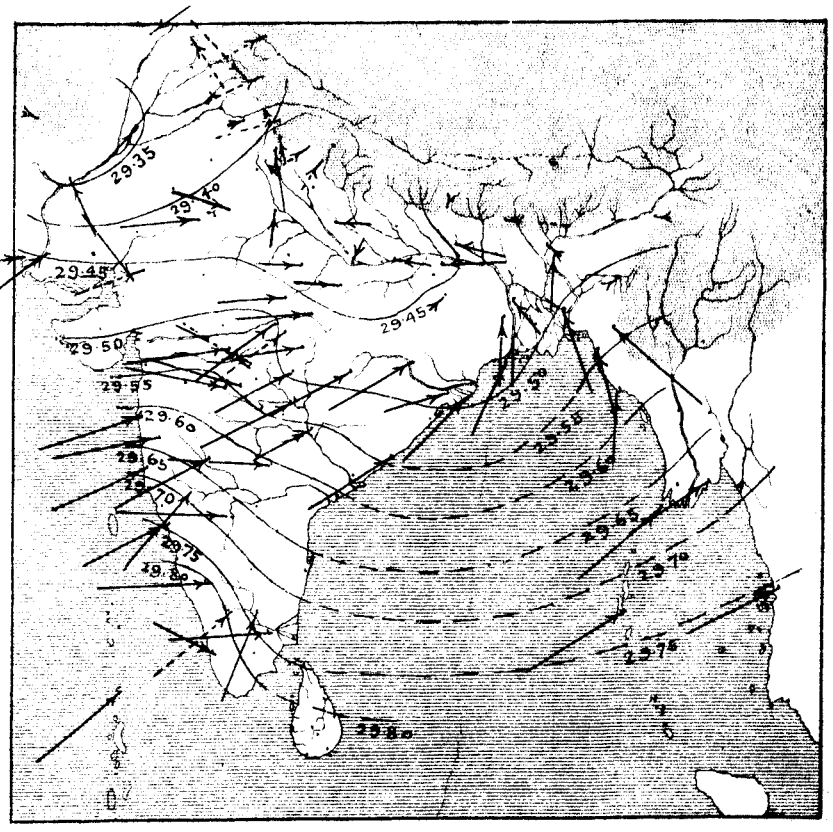
Explanation.

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 1891.



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 ⅕th of an inch being equal to 100 per cent.

Photo-litho. S. I. O. 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. 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.

Photo-litho., S. I. O., Calcutta.

Reg. No. 189, Wr., I.—Feb. 92.—415.

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 51 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 name of the districts 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
3. Central do.
4. Upper do.
5. Arakan
6. Eastern Bengal
7. Assam (Surma)
8. Do. (Brahmaputra)
9. Deltaic Bengal
10. Central do.
11. North do.
12. Orissa
13. Chota Nagpore
14. Behar (South)
15. Do. (North)
16. North Western Provinces (East)
17. Oudh (South)
18. Do. (North)
19. North Western Provinces (Central)
20. Do. do. (West)
21. Do. do. (Submontane)
22. Punjab (South)
23. Do. (Central)
24. Do. (Submontane)
25. Do. (Hill Districts)
26. Do. (North West)
27. Punjab (West)
28. Malabar
29. Madras (South Central)
30. Coorg
31. Mysore
32. Konkan
33. Bombay Deccan
34. Hyderabad (North)
35. Khandeish
36. Berar
37. Central Provinces (West)
38. Do. (Central)
39. Do. (East)
40. Guzerat
41. Kattiawar
42. Sind
43. Central India (East)
44. Rajputana (East) Central India (West)
45. Rajputana (West))
46. East Coast (North)
46(a.) Do. do. (a)
47. Hyderabad (South)
48. Madras (Central)
49. East Coast (Central)
50. East Coast (South)
51. Madras (South)

Reg. No. 322, Wr. I.—Feb. 92.—415.

Photo-litho., S. I. O., Calcutta.

GOVERNMENT OF INDIA.

METEOROLOGICAL DEPARTMENT.

MONTHLY WEATHER REVIEW,

PUBLISHED BY ORDER OF

THE GOVERNMENT OF INDIA.

CALCUTTA, AUGUST, 1891.

INTRODUCTION.

THIS review of the weather in India during the month of August 1891 is based on observations taken daily at 8 A.M. at 161 stations, and on additional observations taken at 10 A.M. and 4 P.M. at 89 stations. The rainfall summary is based on the rainfall data of the meteorological observatories and the weekly rainfall telegrams sent to Simla by District Officers throughout India. The meteorological data of the Bay of Bengal and the Arabian Sea which are collected at the Ports of Calcutta and Bombay are also used, so far as is at present possible, in discussing the weather of India.

Summary of the chief features of the weather in India during the month of August 1891.

The meteorological conditions of the month of August in India are very similar to those of the month of July. The monsoon currents usually prevail with great steadiness and extend over the greater part of the country. It is hence a month of frequent, and in some districts of almost constant, precipitation and of comparatively uniform temperature and high humidity. It is also usually the period of the greatest extension of the monsoon currents and hence that in which Upper India generally obtains the largest amount of rain. Temperature hence falls to some extent in Sind and the Western Punjab, which are, notwithstanding, in this as in the two preceding months, the hottest districts of India. Pressure also tends to rise permanently in Upper India with the decrease of temperature, and before the end of the month the first indications of increasing weakness of the monsoon currents are usually shown.

One of the more important features of the month is the position of the trough of low pressure in Northern India, the character of which was stated in last month's report.

During the month of August 1891 it ran in a north-westerly direction from the Orissa Coast, instead of in the normal west-north-westerly direction across Northern India from Orissa.

The cyclonic storms, which originate at the head of the Bay and advance landwards, are another important feature of the month. Their track is mainly determined by the position of the trough of low pressure at the time of their origin. These storms always give more or less general rain, but the distribution of the rainfall depends largely upon the concentration of the cyclonic whirl and depression. If the depression be shallow and extensive, the rainfall is generally moderate in amount and widely spread. If, on the other hand, it is deep and concentrated, and hence of moderate extent, it gives heavy or excessive rainfall to narrow belts of country. This class of storm is hence frequently a cause of severe local floods and inundations.

The Weather Reviews of the past two months have shown that the south-west monsoon currents were very weak during the month of June and the first half of July. Previously to the fourth week of July they had given general rain only in the coast districts of Bombay and in the Deccan, Bengal, Assam, Burma and the Central Provinces.

Occasional showers had fallen in the North-Western Provinces, but hot weather conditions of high temperature, low humidity and clear skies continued in North-Western India, and the weather was very sultry and oppressive. In the fourth week of July a cyclonic storm crossed Northern India from the head of the Bay to Sind and gave general and fairly heavy rain to nearly the whole of Northern and Central India, and the south-west monsoon rains in the North-Western Provinces, Central India, Rajputana and the Punjab date from this period. Moderately strong and steady south-west monsoon winds blew throughout the month of August in the Bay of Bengal and the Arabian Sea, and more or less general rain fell throughout the whole month. The distribution of the rainfall of the month was largely determined by the numerous depressions and cyclonic storms of the month. These storms formed the chief meteorological feature of the month.

The first cyclonic storm of the month formed on the 31st of July and 1st of August in the north of the Bay, and began to move westwards on the evening of the 1st and passed between False Point and Saugor Island on the 2nd. It gave moderate to hard gales with violent rain squalls in the north of the Bay on the 1st and 2nd, after which the weather gradually moderated. The storm advanced in a west by north track on the 3rd and 4th. The centre was in Lat. 21½° N. and Long. 86½° E. at 8 A.M. of the 3rd and in Lat. 23° N. and Long. 82½° E. at the same hour of the 4th. It then recurved slightly and advanced by a north-west course into Baghelkhand on the 5th, where it filled up. The storm gave a moderate burst of rain to Bengal, Chutia Nagpur and Behar. While the depression was filling up, a strong influx of humid winds advanced across Central India and the western districts of the North-Western Provinces into the South-East Punjab and gave moderate or heavy rain to those districts on the 7th and 8th.

Meanwhile another depression had formed in the north-west angle of the Bay on the 7th. It was of very slight intensity. It advanced through North Orissa into Chutia Nagpur on the 8th, to the eastern districts of the North-Western Provinces on the 9th and to the South-East Punjab (between Agra and Delhi) on the 10th, where it was absorbed in the area of permanent low pressure in the West Punjab on the 11th. This storm was accompanied by a moderate general burst of rain in Northern India which was heaviest in the North-Western Provinces. The trough of low pressure was displaced northwards to the foot of the hills on the 11th, and rain almost ceased to fall in the North-Western Provinces, whilst westerly winds blew across South Behar and Chutia Nagpur into Bengal. At the same time strongish southerly winds advanced from the Bay of Bengal into Central and Eastern Bengal. Heavy rain began to fall in Central Bengal, and a depression formed in that area during the next 24 hours. It advanced slowly westwards through West Bengal on the 13th and Chutia Nagpur on the 14th, and thence drifted through the eastern districts of the North-Western Provinces on the 15th, Oudh and the central districts of the North-Western Provinces on the 16th, into Rohilkhand on the 17th, where it filled up during the day. This storm gave heavy rain over the greater part of Bengal, Behar, Chutia Nagpur, and the North-Western Provinces and Oudh. The rainfall was heaviest on the 15th in the Hardoi and Partabgarh districts in Oudh, and in the Allahabad, Mirzapore, Cawnpore and Fatehpur districts, and falls of five and six inches were registered at many stations in those districts.

Weather was slightly unsettled on the 18th in the Gangetic plain, and heavy rain began to fall in the eastern districts of the North-Western Provinces. This originated a small but very well-marked depression in that area on the 19th. This depression advanced very slowly westwards on the 20th and 21st, and the centre was in Bundelkhand near Nowgong on the 21st and 22nd. It filled up on the 23rd. This disturbance was remarkable for the very heavy rainfall which accompanied it. The cyclonic rainfall was heaviest in the Allahabad, Fatehpur, Banda, Cawnpur and Lalitpur districts, and in Bundelkhand. The Allahabad district, which was the centre of the heaviest rainfall, received an average total of 9·5 inches on the 19th and 20th. The station of Allahabad, where the rainfall was greatest, had 17·08 inches during the same period. On the 23rd, when the depression had filled up, the monsoon trough of low pressure ran west-north-westwards from the Orissa coast into the eastern districts of the Central Provinces, and thence north-westwards into the western districts of the North-Western Provinces. A shallow depression formed in the eastern districts of the Central Provinces, *viz.*, Raipur, Sambalpur and Bilaspur, on the 25th, and heavy rain fell on that day in the Central Provinces and North-Western Provinces. This depression advanced slowly northwards through the eastern and north-eastern districts of the Central Provinces on the 26th and 27th, into the eastern districts of the North-Western Provinces on the 28th, and filled up during the next 24 hours in the central districts of the North-Western Provinces. This disturbance gave a heavy burst of rain to the central districts of the North-Western Provinces, more especially the Cawnpur, Farrukhabad, Mainpuri, Bareilly, Budaon, Moradabad and Philibit districts. Bilhaur, in the Cawnpur district, registered 13·65 inches on the 28th and Baheri, in the Bareilly district, 10·09 inches on the 29th.

The previous remarks have shown that the chief meteorological feature of the month was a succession of depressions and areas of cyclonic rainfall, the great majority of which formed in Bengal or at the head of the Bay and all of which with one exception advanced into the North-Western Provinces and broke up there whilst the remaining depression formed and broke up in that area. The area stretching from Orissa through Chutia Nagpur and

the eastern districts of the Central Provinces to the North-Western Provinces hence received heavy cyclonic rainfall. The indraught to these storms diminished the rainfall in North and East Bengal. The Bombay current gave steady rain to the West Coast districts, Berar, the North Deccan and Central Provinces, and occasional rain to the eastern districts of Central India and Rajputana and to the East Punjab. There were two areas during the month which received exceptionally light rainfall and which were practically areas of drought during the month. The first included the greater part of Rajputana, Kathiawar and Sind, and the second the southern and central districts of Madras. The Bay of Bengal current was in August more largely diverted to Burma than usual, and hence Lower Burma, Arakan and Tenasserim obtained heavier rain than usual. The rainfall in the central districts of Upper Burma was notwithstanding very light and was very considerably below the normal. The following table* gives rainfall data for the larger meteorological divisions :—

PROVINCE.	Mean actual rainfall of August 1891.	Mean normal rainfall for August.	Variation from normal.
	Inches.	Inches.	Inches.
Burma Coast and Bay Islands	30·48	28·29	+2·18
Burma Inland	9·72	11·19	—1·47
Assam	15·51	16·02	—0·51
Bengal and Orissa	11·45	13·91	—2·66
Gangetic Plain and Chutia Nagpur	12·25	11·67	+1·06
Upper Sub-Himalayas	15·61	11·33	+4·28
Indus Valley and North-West Rajputana.	0·90	2·50	—1·60
East Rajputana, Central India and Guzerat.	7·40	9·63	—1·38
Deccan	9·40	8·61	+0·75
West Coast	10·63	19·21	—7·75
Southern India	4·22	6·35	—1·89

The following table gives fuller data for the areas of drought :—

AREA.	RAINFALL.			
	Average actual.	Average Normal.	Variation.	Percentage ratio of actual rainfall to normal.
	Inches.	Inches.	Inches.	
Rajputana (West)	1·04	4·24	—3·20	25
Sind	0·07	1·42	—1·35	5
Kathiawar	2·07	3·82	—1·75	54
Madras (Central)	1·52	4·87	—3·35	31
Madras East Coast (Central)	2·56	5·53	—2·97	46
Madras East Coast (South)	1·96	4·67	—2·71	42
Madras (South)	0·72	2·35	—1·63	31

An average of only about 40 per cent. of the normal fall was received in the central, and south districts of Madras, and the East coast districts south of Masulipatam.

The distribution of the rainfall explains the variations of the temperature conditions of the month from the normal. In the areas of most deficient rainfall both the day and night temperatures were more or less above the normal, whilst in the areas of excessive rainfall the night and day temperatures, and therefore also the mean temperature, were below the normal by moderate amounts. The following table gives temperature variation data :—

PROVINCE.	VARIATION OF		
	Mean maximum from normal.	Mean minimum from normal.	Mean temperature from normal.
	°	°	°
Burma Coast and Bay Islands	+0·4	—0·3	+0·1
Burma Inland	+0·3	—2·0	—0·9
Assam	+1·0	+0·4	+0·7
Bengal and Orissa	+0·3	+0·2	+0·3
Gangetic Plain and Chutia Nagpur	0	—0·2	—0·1
Upper Sub-Himalayas	—2·6	—1·2	—1·9
Indus Valley and North-West Rajputana	+1·6	+0·3	+1·0
East Rajputana, Central India and Guzerat	+0·7	+0·3	+0·5
Deccan	—1·2	—0·2	—0·7
West Coast	+1·2	+0·7	+1·0
Southern India	+1·9	+0·7	+1·3

Temperature was most largely above the normal at Ajmere (+3·3°), and Sambhar (+2·8°) in Rajputana, and at Salem (+4·2°) and Madras (+3·0°) in Southern India, and was most deficient at Meerut (—3·3°), Delhi (—2·7°) and Ludhiana (—2·2°).

The variations of the amount of aqueous vapour in the air from the normal were small except in the areas of drought. In Sind, West Rajputana and Beluchistan there was a very large deficiency, and the mean humidity of the month was from 9 to 15 below the normal of the month. The deficiency was less marked in Madras, and was greatest in the southern and central districts, where the average humidity of the month was below the normal to a moderate extent. The air was slightly damper in the North-Western Provinces, Central India (West), and Central Provinces and Burma, and was somewhat drier in Bengal and Assam.

The following table gives the mean variations of the aqueous vapour pressure, humidity and amount of cloud from the normal in the large meteorological divisions of India :—

PROVINCE.	VARIATION OF		
	Aqueous vapour pressure from normal.	Humidity from normal.	Amount of cloud fom normra
Burma Coast and Bay Islands	—·019	0	+0·8
Assam	+·014	+2	—0·5
Bengal and Orissa	—·016	—1	+0·5
Gangetic Plain and Chutia Nagpur	+·005	+1	+0·6
Upper Sub-Himalayas	—·004	+5	+0·5
Indus Valley and North-West Rajputana	—·066	—7	—0·1
East Rajputana, Central India and Guzerat	—·002	0	0
Deccan	+·001	+2	+1·0
West Coast	—·001	—2	—0·8
Southern India	—·039	—6	—0·1

* It should be noted that the data in this table are taken from Table I. A reference to that table will show that the averages in the first column are in several cases for a greater number of stations than those in second and third columns. Hence the apparent discrepancies.

Atmospheric Pressure.

The distribution of mean 8 A.M. pressure for August is shown by means of two charts. The first chart (Plate I) gives the distribution of the mean pressure of the month reduced to sea-level and to constant gravity (that of latitude 45°) by means of isobars drawn for differences of pressure of ·05″ or $\frac{1}{20}$th of an inch. The second chart (Plate II) gives the variations of the actual mean pressure from the normal pressure. These values are obtained from the barometric readings reduced for temperature only. A small chart, No. 4, of Plate III, gives the distribution of the monthly mean daily pressure and of the mean winds in the same form and manner as in the monthly charts given hitherto in annual reports on the meteorology of India. The data on which this chart is based are given in Table II. The pressure data used in this chart are, it should be noted, reduced to constant gravity (that of 45° lat.) as well as to sea-level. The more important barometric changes and movements during the month are fully given in the following statement of the barometric depressions of the month.

The data that are chiefly used in this discussion are the 8 A.M. reduced observations and the variations derived from a comparison of these observations and the normal values given in Table I. The means in the third column are not only reduced or corrected to sea-level, but also to constant gravity. The normal means are obtained from the observations of the period 1878-88, and in order that the means and variations may be strictly comparable, the means have been calculated for observations of the same period in all cases.

The mean pressure of the whole of India for the month of August 1891 was +·012″ above the normal. Pressure was persistently above the normal from the month of October 1890 until the setting in of the monsoon in July and August 1891, began after which the mean pressure has varied irregularly from the normal for some month fell below the normal and has continued steadily below it up to the present time (October 1891).

Notwithstanding this important change, the more important features which had been impressed upon the meteorology of India by the strongly marked snowfall, temperature and other conditions in North-Western India and the adjacent countries to the north-west during the preceding cold weather season were still conspicuous. The chief was the contrast between the deficient pressure in North-Eastern India and Burma and the excessive pressure in North-Western India and the western half of the Peninsula. The contrast is best shown by considering the anomalies or the local pressure variations when freed from the general pressure variation of the month by deducting ·012.

The pressure anomalies were negative for all stations in Burma, Assam, Bengal, Orissa, Chutia Nagpur, the eastern districts of the Central Provinces and the North-Western Provinces. They exceeded ·020″ in parts of Burma, Assam and East Bengal, and were absolutely greatest at the following stations :—

STATION.	Pressure anomaly.	Variation of Mean pressure from normal.
	In ch.	Inch.
Akyab	—·039	—·027
Saugor Island	—·036	—·024
Sibsagar	—·032	—·020
Chittagong	—·031	—·019
Silchar	—·030	—·018

The pressure anomalies were positive for all stations in North-Western and Western India. They exceeded ·02″ in the western half of the Peninsula, and were greatest at the following stations, where they were slightly above ·030″ :—

DIVISION.	STATION.	Pressure anomaly.	Variation of mean pressure from normal.
		Inch.	Inch.
West Coast Districts	Surat	+·032	+·044
	Ratnagiri	+·036	+·047
	Cochin	+·032	+·044
Deccan	Malegaon	+·031	+·043
	Sholapur	+·029	+·041
	Bellary	+·031	+·043

Barometric Depressions and Cyclonic Storms of the month.

It was stated in the Review for the month of July that a depression began to form in the north of the Bay on the 30th and 31st of that month. This depression was the chief feature of the weather of the first week of the month of August. Its history is given below :—

Cyclonic storm of the 31st July to the 5th August.—This depression formed in the manner in which cyclonic storms are usually generated at the head of the Bay in the rains. The winds fell off rapidly in strength in Bengal on the 30th of July, and became light and variable. At the same time pressure decreased rapidly at the head of the Bay. The barometer continued to fall on the 31st, and the winds shifted in South Bengal to directions showing that a cyclonic circulation was being established in the area of depression. At the same time winds increased rapidly in force in the north and centre of the Bay. On the morning

of the 1st a shallow depression lay between Orissa and Arakan. Pressure was nearly two-tenths below the normal in the centre of this area. Light north-west winds with fine weather obtained off the Orissa Coast, and strong squally winds in the south and south-east portion of the depression. The S. S. *Pentakota*, in Lat. 18° 46′ N. and Long. 90° 39′ E. at noon, had a strong gale throughout the day, and at noon a strong south-west gale with continuous heavy squalls and very high sea. Strong winds (force 6 and 7) were experienced as far south as Lat. 15° N.

The whirl now began to move westwards across the head of the Bay, and intensified further during the night of the 1st. The centre at 8 A.M. of the 2nd was in Lat 20¾° N. and Long. 89½° E. There was the same marked contrast between the winds in the northern and western quadrants, and those in the eastern and southern quadrants as on the 1st. For example, the S. S. *Java* in Lat. 20° 41′ N. Long. 87° 36′ E., or 120 miles west of the centre at noon of the 2nd, had moderate breezes and dull and showery weather in the morning, and light winds in the afternoon. The S.S. *Shahzada* in Lat. 16° 41′ N. and Long. 90° 58′ E., or 300 miles to the south-south-east of the centre and proceeding southwards, had a hard gale with violent squalls and a high sea in the morning, and a moderate gale with thick rain and a high sea in the afternoon. The centre crossed the Orissa Coast between Balasore and False Point about 7 P.M. of the 2nd, and advanced during the night in a westerly direction with a slight northing. The depression had further intensified during the previous 24 hours, and the depression at the centre exceeded three-tenths during the afternoon and night of the 2nd. The centre at 8 A.M. of the 3rd was probably in about Lat. 21° 30′ N. and Long. 86° E. The storm crossed the Orissa hills during the early morning unchanged in character so far as can be judged from the 8 A.M. observations. The following gives 8 A.M. pressure and wind observations at the stations nearest to the centre :—

Station.	Barometer.			Wind.		
	Reduced to sea-level and latitude 45°.	Change in past 24 hours.	Variation from normal.	Direction.	Velocity in miles per hour.	Percentage ratio of actual to normal.
	Inch.					
Cuttack . .	29·342	—·137	—·190	SW	8	266
False Point .	·312	—·148	—·233	SSW	22	220
Balasore . .	·293	—·147	?	ESE	10	?
Chyebassa .	·381	—·086	?	NE	4	?

The 4 P.M. observations are not sufficiently numerous to enable the centre to be exactly placed, but they indicate that the storm continued to advance in a west by north direction.

Heavy rain had fallen in Orissa, Chutia Nagpur and the eastern districts of the Central Provinces during the previous 24 hours. The largest amounts were received in the Cuttack, South Balasore and Sambalpore Districts, where falls of 5 and 6 inches had been generally registered.

The advance of the storm inland was followed by a rapid decrease in the strength of the winds of indraught at the head of the Bay. Moderate to strong breezes with frequent squalls, and a high sea prevailed over the north of the Bay on the morning of the 3rd, but the weather improved considerably during the afternoon. The depression advanced in a north-westerly direction during the afternoon and night of the 3rd. Heavy rain fell in the Central Provinces, but the rainfall to the north was small in amount, thus shewing that the indraught from the Bay of Bengal was now feeble. The depression hence began to fill up rather quickly and was of little importance on the morning of the 4th. The centre at 8 A.M. of that day was in about Lat. 23° N. and Long. 82° 30′ E. The following gives pressure and wind observations at stations nearest to the centre at that hour :—

Station.	Barometer.			Wind.		
	Reduced to sea-level and latitude 45°.	Change in past 24 hours.	Variation from normal.	Direction.	Velocity in miles per hour.	Percentage ratio of actual to normal.
	Inch.					
Hazaribagh .	29·518	+·042	—·023	ESE	18	225
Allahabad .	·497	—·002	—·016	ENE	7	175
Jubbulpore .	·499	—·029	—·042	N	3	60
Raipur . .	·476	—·029	—·093	WSW	20	286

These observations shew that the depression was now small in amount. The 4 P M. observations indicate that the depression continued to fill up during the day, and that rain ceased to fall in the northern, central and eastern portions of the area of depression. The observations of the 5th indicate that a very shallow residual depression lay over Baghelkhand on the morning of the 5th. Rain had, however, ceased to fall in the depression area, and it filled up completely during the afternoon.

The storm was hence much feebler than its predecessor of the last week of July. It began to form whilst that storm was passing through Rajputana. The breaking up of that storm gave a large temporary increase of pressure in North-Western India which shifted the trough of low pressure from its normal position. It ran north-westward from Orissa to the north-western districts of the North-Western Provinces in the first week of August. The storm hence advanced in a north-westerly track, instead of a westerly track, after it had reached land and crossed Orissa.

The following gives the position of the centre at different dates from the 1st to the 4th, and the rate of motion :—

Date.	Hour.	Position.		Distance travelled in past 24 hours.	Rate of motion per hour.
		Latitude North.	Longitude East.		
				Miles.	Miles.
1st . .	8 A.M.	20° 15′	91° 0′		
2nd . .	"	20° 45′	89° 30′	100	4·2
3rd . .	"	21° 30′	86° 0′	230	9·6
4th . .	"	23° 0′	82° 30′	256	10·7

A remarkable feature of the storm was the rapid decrease in the winds of indraught from the Bay of Bengal on the evening of the 3rd and 4th, and the cessation of rainfall in the storm area on the 4th. While the previous depression was filling up on the 4th, a general fall of the barometer occurred over the whole of North India. The fall was large in Upper India and established steep gradients for a brief period. The Bombay current increased and gave general rain to the Central Provinces, Central India, the western districts of the North-Western Provinces and South-East Punjab. The Bengal current gave heavy rain to Burma and moderate rain to Assam, whilst in the intermediate area of Behar and the eastern districts of the North-Western Provinces little or no rain fell. The weather improved rapidly during the night of the 4th, and on the morning of the 5th it was fine with passing clouds, and moderate to strongish winds in the north of the Bay. Ordinary monsoon winds obtained in the south of the Bay and squally weather with moderate monsoon winds in the Andaman Sea.

Shallow depression of the 7th to the 10th August.—This was throughout an ill-defined diffused depression and it is not certain that it was, strictly speaking, a continuous cyclonic whirl or storm throughout. It formed on the 6th in the north-west angle of the Bay and adjacent coast districts, and was nearly stationary during the next 24 hours. The weather was squally with fresh breezes in the north of the Bay on the 7th and 8th. The depression advanced westward during the night of the 7th and was in Chutia Nagpur on the 8th. Moderate rain had fallen in Bengal, and moderate to heavy rain in Chutia Nagpur, Behar and the eastern districts of the North-Western Provinces during the previous 24 hours. The depression was in the eastern districts of the North-Western Provinces on the morning of the 9th, the centre being near Allahabad. Moderate rain had been received during the previous 24 hours in Behar, Bundelkhand and the eastern districts of the North-Westen Provinces. The depression marched rapidly to the west-north-west during the night of the 8th and was in the South-East Punjab, the centre being near Delhi at 8 A.M. of the 9th. The depression at the centre was less than a tenth of an inch at this time. Heavy rain had fallen in the area traversed by the whirl during the day. The depression either filled up, or was absorbed in the Upper Sind and South-West Punjab area of low pressure during the day.

Whilst this cyclonic storm was filling up on the 10th, pressure gave way briskly in Bengal and the north of the Bay, and heavy rain fell in Central and South Bengal. This was followed by the formation of a depression and cyclonic storm of considerable intensity.

Land formed depression and cyclonic storm of the 11th to the 16th August.—Winds increased rapidly in force at the head of the Bay on the 10th, and at the same time heavy rain began to fall in Central Bengal, and pressure gave way briskly in North-Eastern India and the north of the Bay. On the morning of the 11th pressure was uniform in Bengal but steep gradients obtained in the north of the Bay. The S. S. *Chusan*, approaching Saugor, had strong monsoon gales and squalls and heavy rain. The S. S. *Kasara* experienced a moderate gale with frequent squalls and very heavy rain between Chittagong and Akyab, and the S.S. *Kola* had a moderate gale with constant rain off the Arakan Coast. Winds were very light and unsteady in Bengal and calms were reported at 8 A.M. by several stations (*e.g.*, Burrisal, Berhampore, Silchar and Cuttack). The rainfall intensified during the day in South Bengal and Orissa, and pressure decreased rapidly. A well-marked depression and cyclonic circulation was hence established during the night in Bengal, the centre of which was near Jessore at 8 A.M. of the 12th. The following gives pressure and wind data of the stations nearest to the centre at that hour :—

Stations.	Barometer.			Wind.		
	Reduced to sea-level and Lat. 45°.	Change in past 24 hours.	Variation from normal.	Direction.	Velocity in miles per hour.	Percentage ratio of actual to normal.
	Inches.					
Calcutta . .	29·424	—·123	—·175	W	11	220
Burdwan . .	·420	—·120	—·177	NW	5	125
Berhampore .	·421	—·108	—·183	N	3	75
Kishnaghur .	·393	—·130	—·193	NNW	7	?
Jessore . .	·393	—·138	—·223	Calm	3	75
Dacca . .	·424	—·119	—·207	SSE	8	133
Faridpur . .	·420	—·129	—·210	SE	3	75
Burrisal . .	·434	—·096	?	S	7	175

The preceding data indicate that the depression at the centre was nearly ·25″ in amount. Winds were light in the eastern quadrant at Jessore and Faridpur, the stations nearest to the centre. The observer at Jessore reported a calm at 8 A.M. The conditions were very different in the southern quadrant at considerable distances from the centre. Thus at Saugor Island the velocity of the wind during the previous 24 hours averaged 35 miles per hour. The S. S. *Highfield*, lying at anchor near Saugor, had a moderate to hard gale during the day with violent squalls. The S. S. *Chusan*, proceeding up the river, had a moderate gale with heavy rain squalls.

The cyclonic whirl remained almost unchanged in position during the next 24 hours. The centre was probably a little to the north-east of Calcutta at 8 A.M. of the 13th. The following gives data of the stations nearest to the centre at that hour :—

Station.	Barometer.			Wind.		
	Reduced to sea-level and Lat. 45°.	Change in past 24 hours.	Variation from normal.	Direction.	Velocity in miles per hour.	Percentage ratio of actual to normal.
	Inches.					
Calcutta . .	29·394	—·030	—·206	WNW	6	120
Jessore . .	·403	+·010	—·214	SE	4	100
Berhampore .	·420	—·001	—·187	ENE	4	100
Burdwan . .	·406	—·014	—·192	Calm	6	150

The data establish that, although a well-defined cyclonic circulation was established, the winds in the central area of the depression were, as hitherto, very light. Burdwan, a short distance to the west and in front of the centre, had a calm at 8 A.M. Very strong gales continued at the head of the Bay. The velocity of the wind during the previous 24 hours at Saugor Island averaged 36 miles per hour. The S.S. *Ludhiana*, approaching the mouth of the Hooghly, had a strong gale and thick rainy weather, and the S. S. *Traveller* a strong gale and heavy rain. Heavy rain had fallen in Bengal and Behar during the previous 24 hours, the largest falls being recorded at the following stations :—

DATE.	District.	Station.	Rainfall of 24 hours, preceding 8 A.M.
			Inches.
13th	Midnapore	Midnapore	8·00
"	Durbhanga	Durbhanga	9·09
"	Monghyr	Seikpura	5·11
"	Singbhoom	Baharagura	5·30
"	Manbhoom	Barrabhoom	5·30

The storm moved westwards during the day. The centre passed between Calcutta and Burdwan in the afternoon, and was to the south-west of Burdwan at 4 P.M. The rainfall was smaller in amount than on the 12th, and pressure increased slightly in the area of depression during the day. The weather also began to moderate at the head of the Bay.

The depression drifted westwards through West Bengal and Chutia Nagpur on the night of the 13th. The centre at 8 A.M. of the 14th was near Ranchee and in Lat. 23° N. and Long 85½° E. The following gives the pressure and wind observations of that hour at the stations nearest to the centre :—

STATION.	BAROMETER.			WIND.		
	Reduced to sea-level and Lat. 45°.	Change in past 24 hours.	Variation from normal.	Direction.	Velocity in miles per day.	Percentage ratio of actual to normal.
	Inches.					
Sambalpore	29·571	?	?	SW	110	?
Chyebassa	·512	+·031	—·061	SW	64	?
Ranchee	·477	—·007	?	Calm	57	?
Hazaribagh	·520	+·005	—·079	E	354	184

These figures shew that the depression at the centre was now probably not more than ·15″ or a tenth of an inch less than on the previous day. Moderate rain had fallen during the previous 24 hours in Bengal and heavy rain in Chutia Nagpur and Behar. The anemometric observations of Ranchee are very interesting, as they shew clearly that in the central area the horizontal air movement was very small in amount. The following gives comparative data for Ranchee and the neighbouring stations of Hazaribagh and Chyebassa :—

Air movement of 24 hours preceding 8 A.M. of	Ranchee.	Hazaribagh.	Chyebassa.
13th	455	464	72
14th	57	354	64
15th	429	289	32

The depression continued to move westwards through Chutia Nagpur during the afternoon and night of the 14th.

Wind and weather moderated very rapidly in the north of the Bay. The S.S. *Maharaja*, in Lat. 20° 52′ N. and Long. 88° 40′ E. at noon of the 14th, had brisk breezes and cloudy weather, and the S.S. *Highfield* moderate breezes with occasional squalls. Winds of force 3 to 5 obtained during the afternoon and evening in the north of the Bay, and weather was generally fine with passing clouds.

The depression advanced in a north-westerly direction during the night of the 14th, and was in the north-eastern districts of the North-Western Provinces on the morning of the 15th. The centre at 8 A.M. was a little south of Allahabad. The following observations define its position at 8 A.M. :—

STATION.	BAROMETER.			WIND.		
	Reduced to sea-level and Lat. 45°.	Change in past 24 hours.	Variation from normal.	Direction.	Velocity in miles per hour.	Percentage ratio of actual to normal.
	Inches.					
Benares	29·598	+·050	+·028	ENE	7	175
Allahabad	·585	+·013	+·014	ENE	4	100
Sutna	·612	+·017	+·016	WSW	8	100

Heavy rain fell during the day in the central and western districts of the North-Western Provinces and Oudh.

The depression advanced very slowly during the afternoon and night of the 15th. The centre was between Lucknow and Allahabad at 8 A.M. of the 16th. The following table gives 8 A.M. pressure and wind observations at stations nearest to the centre at that hour :—

STATION.	BAROMETER.			WIND.		
	Reduced to sea-level and Lat. 45°.	Change in past 24 hours.	Variation from normal.	Direction.	Velocity in miles per hour.	Percentage ratio of actual to normal.
	Inches.					
Allahabad	29·628	+·043	+·052	WSW	9	225
Gorakhpur	·638	+·004	+·061	E	5	250
Lucknow	·633	+·016	+·045	NE	4	133
Cawnpore	·620	+·032	?	NNW	5	?

The depression continued to advance in a north-westerly direction, and was in the western districts of the North-Western Provinces on the morning of the 17th. The

following gives 8 A.M. wind and pressure observations at stations nearest to the centre at that hour:—

Station.	Barometer.			Wind.		
	Reduced to sea-level and Lat. 45°.	Change in past 24 hours.	Variation from normal.	Directoin.	Velocity in miles per hour.	Percentage ratio of actual to normal.
	Inches.					
Bareilly . .	29·589	—·069	+·010	Calm.	0	0
Agra . .	·625	—·028	+·034	SW	3	43
Lucknow . .	·576	—·057	—·012	SSE	4	133
Allahabad . .	·613	—·015	+·036	WSW	9	225
Gorakhpur .	·609	—·029	+·030	S	1	50

Pressure had decreased during the preceding 24 hours over the whole of Northern India by amounts averaging ·06″ and hence the fall in the depression area was due to the general change, and the depression was in fact filling up. The air motion, although cyclonic in character, was very feeble, and was at this time solely dependent on the Bombay current, as westerly winds were blowing in Behar and Chutia Nagpur and variable or west-south-west winds in South Bengal. Fine weather with light to moderate winds obtained in the north of the Bay.

The depression disappeared during the next 24 hours, and little or no rain fell in the western districts of the North-Western Provinces for some days.

The following table gives the position of the centre and its rate of motion from day to day during its existence:—

Date.	Hour.	Position.		Distance travelled in past 24 hours.	Rate of motion per hour.
		Latitude North.	Longitude East.		
				Miles.	Miles.
11th	8 A M.	22° 45′	80° 45′	?	?
12th	,,	23° 0′	89° 15′	32	1·3
13th	,,	23° 0′	85° 30′	48	2·0
14th	,,	23° 0′	85° 30′	180	7·5
15th	,,	25° 15′	81° 45′	275	11·5
16th	,,	26° 0′	81° 15′	75	3·1
17th	,,	27° 0′	80° 0′	102	4·2

The following points are worthy of record in connection with the storm:—

1st.—It originated in the centre of Bengal during a burst of heavy rain.

2nd.—Throughout its existence the heaviest rainfall was in the advancing quadrant or in front of the centre.

3rd.—It advanced along the trough of low pressure which during this period lay further to the north than usual.

The weather was in an unsettled condition in North-Eastern India on the 18th after the disappearance of the depression described above. Moderate monsoon winds were blowing at the head of the Bay and in the Arabian Sea.

There was a marked tendency to the occurrence heavy rain in Central Bengal and in the eastern district of the North-Western Provinces. A shallow and feebl depression overlay Central Bengal on the morning of tl 18th the position of which is indicated by the followin observations:—

Stations.	Barometer.			Wind.		
	Reduced to sea-level and Lat. 45°.	Change in past 24 hours.	Variation from normal.	Direction.	Velocity in miles per day.	Percenta ratio c actual normal
	Inches.					
Berhampore .	29·586	—·038	—·024	WSW	89	93
Mymensing .	·620	—·037	—·022	SSW	188	?
Dinagepore .	·587	—·040	—·043	E	29	?

Easterly winds extended westwards along the base the hills as far as Lucknow, and the Bombay or wester current was blowing across Central India, Baghelkhand ar Bundelkhand into the eastern districts of the North-Weste Provinces. These winds tended to give rise to a cyclon circulation in the eastern districts of the North-Weste Provinces. That area was one of almost uniform pressu and of light winds, except in the south portion, in whi strongish westerly winds were blowing. The shallow d pression in Central Bengal disappeared during the da Very heavy rain fell in the eastern districts of the Nort Western Provinces, but this produced as yet no lar change in the pressure or wind conditions, except loca at Allahabad, where a depression formed during the nig of the 18th.

Land formed depression of 19th to 23rd of August. The following table gives pressure and wind data of statio in and near the depression whilst it was forming on t morning of the 19th:—

Station.	Barometer.			Wind.		
	Reduced to sea-level and Lat. 45°.	Change in past 24 hours.	Variation from normal.	Direction.	Velocity in miles per hour.	Percen ratio actual norm
	Inches.					
Allahabad . .	29·496	—·076	—·088	WNW	15	37
Benares . .	·568	—·001	—·013	S	7	17
Gorakhpur .	·590	+·014	—·002	E	3	15
Lucknow . .	·596	—·001	0	Calm	3	10

The westerly winds at Allahabad had increased c siderably in force during the previous 24 hours, the barome had fallen locally, and very heavy rain was being receiv A small but very strongly marked depression had her formed over Allahabad and its neighbourhood. The forr tion of this depression was associated with excessive ra

fall in the Allahabad, Cawnpore, Banda and Fatehpur districts. The following gives data of this rainfall:—

DISTRICT.	Average fall in district of 24 hours preceding 8 A.M.	Heaviest rainfall in district.
	Inches.	Inches.
Allahabad	5·21	10·07
Banda	3·10	5·64
Fatehpore	4·49	9·30
Cawnpore	3·11	7·43

Heavy rain continued to fall during the day in the Allahabad and neighbouring districts, and the depression which had formed remained almost unchanged in position but increased in extent, whilst the intencity diminished.
The following gives data for 8 A.M. of the 20th:—

STATION.	BAROMETER.			WIND.		
	Reduced to sea-level and Lat. 45°.	Change in past 24 hours.	Variation from normal.	Direction.	Velocity in miles per hour.	Percentage ratio of actual to normal.
	Inches.					
Sutna	29·564	—·054	—·040	WSW	13	163
Allahabad	·580	+·084	—·011	ESE	19	475
Cawnpore	·637	+·031	?	NNE	7	?

The data hence show that the centre was now near to Sutna, and that the depression was moving slowly westwards.

The depression continued to advance very slowly westwards during the day. Very heavy rain fell in the Hamirpur, Lalitpur and part of the Jhansi districts, whilst it almost ceased in the Allahabad and Fatehpur districts. The following gives data of the rainfall in these districts for the 24 hours ending at 8 A.M. of the 20th and 21st:—

DISTRICT.	Date.	Actual mean rainfall of district of 24 hours preceding 8 A.M. of data.	Heaviest fall in district.
		Inches.	Inches.
Allahabad	20th August 1891	4·29	7·01
Fatehpur	"	2·99	4·65
Jhansi	"	2·40	5·00
Hamirpur	"	1·02	2·20
Lalitpur	"	0·16	0·32
Allahabad	21st "	0·05	0·30
Fatehpur	"	0·26	0·45
Jhansi	"	2·02	7·10
Hamirpur	"	4·07	6·50
Lalitpur	"	4·03	7·33

The depression advanced westwards during the next 24 hours. The centre was near Nowgong in Bundlekhand at 8 A.M. of the 22nd. The following gives data indicating the character and position of the depression at 8 A.M. of the 22nd:—

STATION.	BAROMETER.			WIND.		
	Reduced to sea-level and Lat. 45°.	Change in past 24 hours.	Variation from normal.	Direction.	Velocity in miles per hour.	Percentage ratio of actual to normal.
	Inches.					
Sutna	29·579	—·026	—·034	S. E.	7	88
Cawnpore	·593	+·002	?	E.	6	120
Nowgong	·548	+·055	—·061	E.	5	167
Jhansi	·555	—·016	—·030	N. E.	7	175
Saugor	·581	—·039	—·046	W.	9	225

The circulation in the area of depression was hence not strong. Heavy rain continued to fall in the Lalitpur district, but ceased in all the neighbouring districts. The depression hence remained almost unchanged in position and began to fill up during the next 24 hours. The following observations indicate its character and extent at 8 A. M. of the 23rd:—

STATION.	BAROMETER.			WIND.		
	Reduced to sea-level and Lat. 45°.	Change in past 24 hours.	Variation from normal.	Direction.	Velocity in miles per hour.	Percentage ratioof actual to normal.
Sutna	29·611	+·032	—·002	S. E.	3	37
Cawnpore	·615	+·022	?	E. N. E.	4	?
Nowgong	·638	+·090	+·027	E. N. E.	2	67
Jhansi	·629	+·074	+·038	N. E.	4	100

Pressure was at this time increasing slowly over the greater part of India. The rise in the North-Western Provinces and Central India averaged ·03″. The preceding observations hence show that the depression had almost filled up and was of little importance. No rain fell in the area on the afternoon of the 23rd, and the depression and disturbance disappeared during the day.

The storm was hence a land-formed depression, and its formation and existence were evidently dependent on the local heavy rainfall which accompanied it. When it began to move, it advanced in the direction of the heaviest rainfall.

When the preceding depression was filling up the trough of minimum pressure was transferred northwards and stretched from Orissa to the Central Punjab through Cawnpore. Weather was fine with moderate monsoon winds at the head of the Bay. A very shallow local depression formed on the 24th in the eastern districts of the Central Provinces, which was transferred very slowly northwards during the next five days into the eastern districts of the North-Western Provinces, where it filled up on the evening of the 28th. General rain fell in Bengal, the North-Western Provinces, Central India and the Central Provinces from the 24th to the 28th, after which the rainfall diminished rapidly in amount in Northern and Central India, and was restricted to Bengal at the end of the month.

Summary of Weather in the Bay of Bengal and the Arabian Sea.

Bay of Bengal.—At the beginning of the month a depression was forming in the north of the Bay. It covered the north-east angle of the Bay on the 1st and advanced westwards across the head of the Bay on the 2nd, and passed inland through Orissa and South-West Bengal on the morning of the 3rd. Moderate to strong gales with hard squalls and heavy rain were experienced on the 1st and 2nd to the south-east and south of the centre of the depression. These strong winds extended southwards as far as Lat. 15° N. Weather was, as usual, fine with light winds to the north-west and west of the centre. The S. S. *Shahzada* on the 2nd in Lat. 16° 40′N. and Long. 90° 58′E. had a hard gale with violent squalls and a high sea, and the S. S. *Pentakota* in Lat. 19° 51′ N. at noon had a strong gale with continuous rain during the day. The weather improved rapidly on the 3rd, and on the 4th moderate to strong winds (force 4 to 6) with fine weather obtained in the Bay. Weather at this time was squally with strong winds in the north of the Andaman Sea off the Burma coast. Fine clear weather with moderate to fresh winds (force 4 to 5) held steadily in the centre and south of the Bay. Winds fell off in strength on the 5th at the head of the Bay and weather became squally and slightly unsettled on the 7th and 8th. Winds again increased, and on the 10th moderate to strong winds (force 4 to 6) obtained in the north of the Bay, and weather was squally with much rain off the Andaman Islands. Heavy general rain was falling in Bengal, and this largely increased the indraught from the Bay for a short time. Hence on the 11th moderate to strong south-westerly and westerly gales were experienced in the north of the Bay. The S. S. *Chusan* approaching Saugor had strong monsoon gales, hard squalls and heavy rain, and the S. S. *Kola*, proceeding from Chittagong to Akyab, had a moderate gale throughout with frequent heavy squalls and very heavy rain. Winds were also slightly stronger in the centre and south of the Bay.

Similar weather obtained in the Bay on the 12th and 13th. The S. S. *Highfield*, which arrived at Saugor on the 12th, had a moderate to hard gale with violent squalls. The S. S. *Ludhiana* on the 13th approaching Saugor had a strong gale and thick squally weather and the S. S. *Traveller*, which entered the river Hooghly in the afternoon, had a strong gale with violent squalls and heavy rain in the morning. A depression which had formed in South Bengal on the 11th and 12th was now advancing west-north-westerly up the Gangetic plain and the weather began to improve at the head of the Bay. Winds fell off rapidly in strength on the 14th, and on the morning of the 15th light to moderate south-west winds obtained over the whole of the Bay. Weather was generally fine and clear at the head of the Bay.

Fine weather with moderate to fresh winds now obtained for a short interval in the Bay. The winds became light and variable on the 18th at the head of the Bay. On the 19th weather was squally in the centre of the Bay between Lat. 14° and 18° N. and Long. 84° and 90° E. This area of squally weather extended northwards on the 20th and 21st, and on the 22nd a shallow depression lay off the coast of Orissa and Ganjam. The winds were light and somewhat variable in the north-west angle of the Bay, but had increased considerably in force on the 22nd in the centre of the Bay. The S. S. *Loch Maree* in Lat. 17° 26′ N. and Long. 86° 23′ E. at noon of the 22nd had strong westerly winds with fierce rain-squalls during the greater part of the day. The *Loch Maree* off False Point at noon of the 23rd had fierce north-west squalls. The S. S. *Patna* in Lat. 17° 21′ N. and Long. 92° 3′ E. at noon, and proceeding to Calcutta, had heavy squalls during the day. Weather hence was squally over the north-east and north of the Bay. In the centre and south, monsoon winds of force 5 and fine weather prevailed.

The weather improved on the 24th in the north-east of the Bay, and fine weather with moderate winds, force 3 to 4, set in off the Arakan Coast.

The weather continued squally and unsettled with unsteady winds near the Orissa and Ganjam coasts, and a very shallow depression was shown in this part of the Bay for some days.

The S. S. *Elbe*, which passed through this depression on the 25th, describes the weather she experienced in the following terms:—"Brisk to fresh breezes during the day; wind puffy with showers."

This shallow depression which was evidently of little importance disappeared on the 26th, and on the 27th, and during the remainder of the month light to fresh monsoon winds (force 3 to 5) with fine and generally clear weather obtained throughout the Bay.

There was a slight tendency shown on the 30th and 31st to the formation of a depression off the North Madras coast, and squally weather was experienced by the S. S. *Rydal Hall* in Lat. 17° N. and Long. 86° E. on the 30th.

Arabian Sea.—At the commencement of the month a strong monsoon was blowing in the central area of the Arabian Sea between Socotra and the Bombay Coast. The winds in the centre of this area were of force 7 to 9, and decreased to force 4 to 6 near the Bombay Coast. The S. S. *Werneth Hall* in Lat. 15° 57′ N. and Long. 59° 22′ E. at noon of the 2nd had south winds of force 9 to 10 throughout and a very high sea, and the S. S. *La Seyne* in Lat. 17° 50′ N. and Long. 65° E. at the same hour, had W.S.W. winds of force 6 to 8 throughout the day with a high sea.

The S. S. *Brownfils* in Lat. 14° 26′ N. and Long. 58°45′ E., at noon of the 4th, had S. W. winds, force 6 to 8, and a tremendous sea. The S. S. *Cathay* in Lat. 17° 9′ N. and Long. 58° 42′ E. on the 7th had S. W. winds, force 6 to 8, with a high sea and squally weather. No change apparently occurred until about the 10th, when the winds in this central area decreased to some extent in force. During the remainder of the month winds were of force 5 to 7 in the central area and 2 to 5 in the neighbourhood of the Bombay coast. Thus the S.S. *Assam* in Lat. 16° 8′ N. and Long. 61° 23′ E. at noon of the 28th had a moderate to fresh monsoon south-west winds of force 3 to 5 and occasional showers. On the 29th, in Long. 66° 48′ E. at noon she had a moderate monsoon and cloudy weather, and on the 30th, when approaching Bombay, south-west winds of force 3 and fine weather.

Summary of Special Storm Reports.

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

3rd August.—Duststorm at Aden. It is stated to have advanced from the interior of Arabia and passed over Aden between 5-55 and 6-40 P.M.

9th August.—Severe duststorm at Jacobabad. It commenced from east-north-east at 6 P.M., and lasted for half an hour.

12th and 13th August.—Severe duststorm at Hyderabad (Sind). It commenced at about 10 P.M. of the 11th, and lasted for 4 hours. After an interval of some hours a second duststorm appeared on the morning at 7 A.M. and lasted up to 4 P.M. of the 13th. The wind was very high during the two storms.

27th August.—Duststorm at Aden. It crossed through Aden from the interior of Arabia, between 4-40 and 5-30 P.M.

30th August.—Violent thunderstorm at Nagpur from 3-40 to 4-30 P.M.

Temperature of the Air.

The distribution of temperature in India for August 1891 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. The continuous lines indicate that the temperature was in excess by the amount indicated by the number given near the line, and the broken lines 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 data by means of which these charts have been prepared are given in Table I. The mean maximum and minimum temperatures have been obtained for each station from the observations of the same number of years *viz.*, 1878 to 1888. 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 amounts, which vary from month to month. But the variation of the mean daily temperature from the normal, as determined by the use of this definition, agrees in almost all cases very closely with the variation as determined by the use of true daily means based on readings at 16 hours, in addition to those 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.

The mean day or maximum temperature of the month of August 1891 was in slight excess in Burma and Bengal and in largish excess in the two areas of drought. In the Rajputana drought area the mean maximum temperature was from 2° to 4·3° above the normal, the excess being greatest at Ajmere (4·3°) and Sambhar (4°). In the Madras or South India drought area it was also in excess by amounts ranging from 2° to 6°, the excess being greatest at Salem (6°), Negapatam (4·3°), and Madras (4·1°).

The mean maximum temperature was below the normal in the East Punjab, the North-Western Provinces, Central India, Berar, the Central Provinces, Orissa and Chutia Nagpur. The deficiency was slightly more than 2° in the Central Provinces, the western districts of the North-Western Provinces and at Ludhiana and Sialkot in the Punjab.

The variations of the mean minimum temperature from the normal were generally smaller than those of the maximum temperature. The mean minimum was below the average in Lower Burma, Orissa, the Central Provinces, the North-

Western Provinces, the East Punjab and Lower Sind, and at Quetta. The variations were less than 2° except in the following cases :—

STATION.	Variation of mean minimum from the normal.
	°
Salem	+2·4
Ajmere	+2·2
Meerut	—2·4

The variations at Akyab, Thayetmyo and Diamond Island given in Table I are almost certainly erroneous, due to the use of unsatisfactory instruments.

The mean temperature of the month was in excess over the whole of India except Orissa, the Central Provinces, the North-Western Provinces, and the East Punjab. The excess was slightly greater than 2° in the two drought areas as is shown by the following data :—

DISTRICT.	Station.	Variation of mean temperature from the normal.
		°
Rajputana	Ajmere	+3·3
	Sambhar	+2·8
	Jeypur	+2·1
Central and East Coast Madras	Salem	+4·2
	Madras	+3·0
	Negapatam	+2·4

The variations in the areas of deficient temperature were less than 2° except in the area defined by the following stations :—

DIVISION.	STATION.	Variation of mean temperature from the normal.
		°
Upper Sub-Himalayas	Delhi	—2·7
	Meerut	—3·3
	Roorkee	—2·1
	Ludhiana	—2·2

The temperature changes from day to day in August are usually determined by the occurrence and distribution of rainfall. In Central and North-Western India the suspension of rainfall always gives rise to a large increase of temperature, whilst its occurrence causes a large and rapid fall. The following gives a brief statement of the more important temperature changes during the month.

Temperature was considerably above the normal in the Gangetic plain, as well as in Madras, Sind, and West Rajputana at the commencement of the month. Temperature increased in North-Western India until the 5th. The extension of the Bombay current into the South-East Punjab on the 6th caused a large reduction of temperature on the following days. Thus on the 7th, the mean temperature of the day was 10·1° below the normal at Rawalpindi. As rainfall was fairly general except in the two areas of drought, temperature was practically normal in the coast districts and considerably below it in the interior except in Madras and Rajputana, Sind, and the West Punjab.

The following table giving temperature variation data of the 15th indicates fairly the chief features of the distribution of temperature during this period :—

PROVINCE.	VARIATION OF		
	Mean maximum from normal.	Mean minimum from normal.	Mean temperature from normal.
	°	°	°
Burma	+2·4	+0·4	+1·4
Bengal	—1·7	—1·4	—1·6
North-Western Provinces	—5·9	—1·5	—3·7
Punjab	—3·6	—1·9	—2·8
Rajputana	0	+0·6	+0·3
Central India	—2·2	—0·3	—1·3
Central Provinces	—6·9	—1·4	—4·2
Bombay	—0·3	+0·9	+0·3
Madras	+3·3	+0·1	+1·7

Temperature increased on the 16th and following days in consequence of rain ceasing to fall in North-Western and Central India except in light local showers. The following gives temperature variation data of the 18th :—

PROVINCE.	VARIATION OF		
	Mean maximum from normal.	Mean minimum from normal.	Mean temperature from normal.
	°	°	°
Burma	+1·1	—0·9	+0·1
Bengal	—0·1	+0·6	+0·3
North-Western Provinces	—1·7	—0·8	—1·3
Punjab	+0·1	+1·3	+0·7
Rajputana	+3·8	0	+1·9
Central India	+0·8	—1·7	—0·5
Central Provinces	+0·1	+0·1	+0·1
Bombay	+2·8	+0·3	+1·6
Madras	+3·7	+2·0	+2·9

Rainfall increased and became more general on the 20th and following days, but was light to moderate in amount. Hence temperature was more or less above the average until the 25th. The following gives variation data of the 24th :—

PROVINCE.	VARIATION OF		
	Mean maximum from normal.	Mean minimum from normal.	Mean temperature from normal.
	°	°	°
Burma	+0·6	—0·9	—0·2
Bengal	+1·0	+0·6	+0·8
North-Western Provinces	+1·6	+0·1	+0·9
Punjab	+3·5	+3·0	+3·3
Rajputana	+4·8	+1·9	+3·4
Central India	+1·7	+0·4	+1·1
Central Provinces	—2·0	+0·7	—0·7
Bombay	+1·9	+0·5	+1·2
Madras	+3·0	+1·0	+2·0

Heavy general rainfall set in again on the 25th over Northern and Central India and the Central Provinces and the North Deccan, and continued steadily until the 28th.

The following table giving the temperature variation data of the 28th shows the effect of general heavy rain in reducing temperature during the rains proper in India :—

PROVINCE.	VARIATION OF		
	Mean maximum from normal.	Mean minimum from normal.	Mean temperature from normal.
	°	°	°
Burma	+3·1	+0·7	+1·9
Bengal	+1·0	+0·5	+0·8
North-Western Provinces	—2·3	—1·8	—2·1
Punjab	—5·5	—3·9	—4·7
Rajputana	+0·9	—1·0	—0·1
Central India	—1·9	—0·3	—1·1
Central Provinces	—6·4	—1·9	—4·2
Bombay	—0·1	—0·7	—0·4
Madras	+2·9	+0·3	+1·6

Rainfall diminished considerably in amount during the next two days, and was almost confined to the coast districts on the 30th and 31st. Hence temperature again increased considerably and was above the normal over nearly the whole of India on the 31st. The following gives variation data of that day :—

PROVINCE.	VARIATION OF		
	Mean maximum from normal.	Mean minimum from normal.	Mean temperature from normal.
	°	°	°
Burma	—0·4	—1·0	—0·7
Bengal	+2·1	+0·5	+0·3
North-Western Provinces	+2·5	+1·0	+1·8
Punjab	—1·5	—1·5	—1·5
Rajputana	+6·2	+3·4	+4·8
Central India	+3·6	+1·0	+2·3
Central Provinces	+0·6	+1·3	+1·0
Bombay	—0·2	+0·9	+0·4
Madras	—3·3	+1·1	—1·1

Winds.

The mean wind directions at 8 A.M. during the month are shown in Plate I by arrows flying with the wind. They are obtained by the use of Lambert's formula, in which equal value is given to every wind. The data are given in Table I. The mean wind directions derived from the wind observations at 10 A.M. and 4 P.M. are given in the small chart, No. 4 of Plate III, by means of arrows flying with the wind. The data for these will be found in Table II, together with the normal directions as obtained from the observations of the past 10 to 20 years.

The mean amount of air motion at Port Blair and the Burmah coast stations was nearly 30 per cent. above the normal, and at the stations on the Bengal and Orissa coasts was about 10 per cent. above the normal. The marine data establish that a fairly steady and strong monsoon prevailed during the month in the Bay, and the anemometric data given in Table II establish that the current was above its normal strength in the north and east of the Bay.

The rainfall data of the month indicate that the current was deflected to a greater extent than usual into Lower Burmah. This is further confirmed by the mean wind directions at Port Blair and the Lower Burmah stations which contain a stronger westerly element than usual. The following data illustrate this feature :—

STATION.	DIRECTION.		STEADINESS.	
	Mean wind direction, August 1891.	Normal mean wind direction, August.	Percentage, August 1891.	Average percentage, August.
Port Blair	S 61° W	S 43° W	89	82
Diamond Island	S 47° W	S 44° W	82	78
Rangoon	S 48° W	S 36° W	82	68

That part of the current which advanced up the north of the Bay into Bengal was deflected much more considerably to the west than usual, so that East and North Bengal and Assam almost certainly obtained a smaller proportion of the Bay monsoon current than usual. This deflection is shown fully by the following data :—

STATION.	DIRECTION.		Deflection.
	Mean wind direction, August 1891.	Normal mean wind direction, August.	
Akyab	S 16° E	S 1° E	15° E
False Point	S 40° W	S 57° W	17° E
Saugor Island	S 6° E	S 17° W	23° E
Burdwan	S 53° E	S 23° E	30° E
Berhampore	S 72° E	S 40° E	32° E

These figures also show that on the whole the deflection increased in amount northwards from Lat. 20° N. to Central Bengal. This strong westerly set of the current in South-West Bengal gave much steadier winds in Chutia Nagpur and Patna, and impressed upon them a strongly marked easterly component, as is shown by the following data :—

DISTRICT.	Station.	DIRECTION.		STEADINESS.	
		Mean wind direction, August 1891.	Normal wind direction, August.	Percentage, August 1891.	Average percentage, August.
Chutia Nagpur	Hazaribagh	S 60° E	N 50° W	29	7
Behar	Patna	S 86° E	S 19° E	63	34

The chief interaction between the Bombay and Bengal currents occurred over the southern and central districts of

the North-Western Provinces. This area was also traversed by the majority of the storms of the month. Hence the winds in this area were very unsteady, and their mean directions indicate a marked tendency to cyclonic circulation. The following gives data for representative stations in that area :—

Station.	Direction.		Steadiness.	
	Mean wind direction, August 1891.	Normal mean wind direction, August.	Percentage, August 1891.	Average percentage, August.
Agra	N 43° W	S 22° E	13	10
Lucknow	N 62° E	S 77° E	37	12
Allahabad	N 21° W	N 40° E	8	4
Ghazipur	S 62° E	S 50° E	34	19

Strong monsoon winds obtained on the Bombay Coast from the 1st to the 9th or 10th and again from the 15th to the 20th and winds of normal strength during the remainder of the month. The average air movement of the month was slightly above the normal of the month at the Bombay coast stations. Winds were considerably above their normal force in the Central Provinces and Deccan. A striking meteorological feature of the month was the very strong air current across the Deccan. The following gives data for typical stations in the Central Provinces and Deccan illustrating this feature :—

Station.	Air movement daily.			Steadiness.	
	August 1891.	Normal, August.	Per cent.	Percentage, August 1891.	Average percentage, August.
Sholapur	300	273	+10	88	79
Belgaum	599	497	+30	87	89
Secunderabad	316	246	+28	89	83
Akola	250	191	+30	93	80
Nagpur	218	144	+50	85	62
Pachmarhi	228	179	+25	85	62

The winds blowing across Central India and the North Deccan had an unusually strong northerly element. This was very marked at Deesa where the mean direction of the wind for the month was N. 36° W., the normal being S. 47° W. The winds on the west coast were on the average of the month practically normal in direction. That portion of the Bombay current crossing the Deccan advanced in an almost due easterly direction. The northern portion of the current advanced across Central India, Berar, and the northern districts of the Central Provinces and thence passed across the eastern districts of Rajputana into the western districts of the North Western-Provinces and South-East and East Punjab.

Humidity and Cloud.

The hygrometric data for 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 the minimum of the 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 *Vade-Mecum*, which are 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 5 to 20 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 computed, are the means for periods varying from 5 to 25 years of the available cloud data for the same hours.

The humid monsoon currents have usually their greatest extension in the months of July and August. The sky is usually more or less covered with cloud and the air is very damp over the greater part of India excepting two areas. The first includes Sind, the South-West Punjab, and North-West Rajputana, and the second South Madras, *i.e.*, the districts of Tinnevelly, Madura, and Trichinopoly. These areas only receive very occasional showers during the south-west monsoon proper, and are the regions of highest temperature.

The rainfall in August 1891 over the whole of Rajputana was very considerably below the average, and the air was much drier than usual in that province and the districts to the north-west including Sind, Beluchistan, and South-West Punjab. The following gives data for stations in that dry area :—

Station.	Aqueous Vapour Tension.			Humidity.		
	Normal, August.	Mean actual, August 1891.	Variation from normal.	Normal, August.	Mean actual, August 1891.	Variation from normal.
Jeypore	·816	·761	—·055	78	69	— 9
Ajmere	·780	·769	—·011	76	69	— 7
Hyderabad	·790	·666	—·124	64	54	—10
Jacobabad	·815	·774	—·041	57	49	— 8
Mooltan	·879	·737	—·142	63	49	—14

The air was somewhat damper in the East Punjab and the North-Western Provinces. The humidity was 9 above the average of the month at Meerut. In Behar, Chutia Nagpur, Bengal, Assam, and Orissa the air was very slightly

drier, but the variations were small and of no significance.

There was on the average somewhat more aqueous vapour in the air in Behar and the Central Provinces, and the humidity was considerably above the normal chiefly in consequence of decreased temperature. The excess was greatest at Seoni (+8) and Hoshangabad (+7).

South and Central Madras formed an area of deficient rainfall and drought, and hence of greatly decreased humidity. The following gives data for stations in that area :—

Station.	Aqueous Vapour Tension.			Humidity.		
	Normal, August.	Mean actual, August 1891.	Variation from normal.	Normal, August.	Mean actual, August 1891.	Variation from normal.
Salem . . .	754	.87	—·067	74	61	—13
Trichinopoly . .	717	.678	—·039	61	55	— 6
Madras . . .	804	810	+·006	71	66	— 5

The humidity conditions in Lower Burmah and in Bombay were practically normal.

There was more cloud than usual at Port Blair and in Lower Burma. The excess averaged 1·9 at Port Blair. The cloud amount was also in excess in Bengal, Orissa, Chutia Nagpur, and South Behar, but the variations were small and less than 1 except at Chittagong (+1·3) and Saugor Island (+1·0). The average amount of cloud during the month was as large in the North-Western Provinces as in the province of Bengal and was above the normal to a greater extent. The increase was most marked at the stations where winds were most unsteady as is shown by the following data :—

Station.	Cloud Amount.			Steadiness of wind expressed as a percentage.
	Actual average, August 1891.	Normal average, August.	Variation from normal.	
Agra . . .	8·1	6·5	+1·6	13
Allahabad . .	8·9	7·5	+1·4	8
Lucknow . .	8·6	7·5	+1·1	37

The cloud was also in moderate excess in the South-East Punjab, but was considerably below the normal in Rajputana, Sind and the South-West Punjab :—

Meteorological Province.	Station.	Cloud Amount.		
		Actual average, August 1891.	Normal average, August.	Variation from normal.
Rajputana .	Ajmere . .	4·3	6·2	—1·9
	Mount Abu .	7·5	8·6	—1·1
Sind . . .	Jacobabad . .	1·4	2·2	—0·8
South-West Punjab . . .	Mooltan . .	1·5	2·2	—0·7

The average cloud amount of the month was largely in excess in the Central Provinces and Berar, more especially at Seoni (+3·2), Saugor (+2·0), and Sambalpur (+1·6). The excess averaged 1·5 for the Central Provinces, the normal amount being 7·0. The variations from the normal in Bombay and the North Deccan were small in amount. The smallest cloud amounts of the month were registered in India at Jacobabad (1·4) and Mooltan (1·5). The average for the month at the Extra Indian Station of Bushire was 0, and of Bagdad 0·3.

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 offices of the Meteorological Reporter, Director of Land Records, or other officer 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 August 1891 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.

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 160 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 indicating the rainfall. The line of no rainfall is indicated by two parallel lines separated by a short distance, one continuous and the other dotted, the latter facing the districts of no rainfall.

The second chart illustrating the distribution of the rainfall of the month is given in Plate V, and shows by figures the variation of the mean actual rainfall of the month from the normal rainfall in each of the 51 meteorological districts into which India and Burma have been divided for purposes of comparing crops, rainfall, etc. The data of this chart are deduced from the rainfall information telegraphed by district officers, of which a summary is given in the following table, and the actual figures utilized are those given in the last column. The numbers given in the centre of each district are the variations of the

actual mean rainfall of the district from the normal mean rainfall; a number given in a corner of each district in small slanting figures serves as an index by means of which, on referring to the list of districts at the foot of the chart, the name of the district can be at once ascertained.

The average distribution of rainfall in August is very similar to that of July. The areas of least rainfall are :—

1st.—Central Burma, including the districts on each side of the Irrawaddy between Bhamo and Thyetmyo. The rainfall data for this area only extends over four years, and is hence not sufficient to give reliable means. It is probable that over a considerable portion of this area the average rainfall in August is less than two inches.

2nd.—The southern districts of Madras, including Tinnevelly and Madura, and parts of Coimbatore and Salem, in which the average rainfall ranges from a third of an inch (at Tuticorin) to two inches.

3rd.—Upper Sind and the West Punjab, the average rainfall of which ranges from one to two inches.

The areas of heaviest rainfall are:—

1st.—The west coast districts and West Ghats, which generally receive almost daily heavy rain in August.

2nd.—Arakan, Lower Pegu and Tennasserim.

3rd.—Assam and the Lower Himalayas.

4th.—The greater part of the Central Provinces.

5th.—Portions of Central and South Bengal.

The average rainfall of all these areas exceeds 15 inches, and ranges from that amount to 80 inches at Cheerapunji and 70 inches at Mohableshwar in the West Ghats. Over the remainder of India the average rainfall amount ranges generally between 2 and 15 inches and depends mainly upon situation with respect to the sea (or the monsoon current) and higher mountains, and to a small extent whether it is in the area of the trough of low pressure.

The actual distribution of rainfall in August 1891 is given in Plate IV. A glance at it will show that the chief abnormal features were—

1st.—Excessive rainfall in the coast districts of Arakan, Burma and Tenasserim, over a large part of which the rainfall exceeded 30 inches in amount.

2nd.—Very deficient rainfall in an area in North Bengal and Behar, stretching from Dhubri to Purneah. In that area the rainfall of the month was less than 4 inches. The great deficiency in this area accompanied a general deficiency over the whole of Bengal.

3rd.—Excessive rainfall over the whole of the western and central districts of the North-Western Provinces which received more than 20 inches. The rainfall exceeded 30 inches in a small area of which Allahabad was the centre.

4th.—Diminished rainfall in Sind, and the West Punjab. Over a portion of this area no rain fell, and the precipitation was less than one inch in amount over by far the greater part of it.

5th.—Excessive rainfall in the central districts of the Central Provinces, which received more than 20 inches.

6th.—Decreased rainfall in the west coast districts and in the peninsula generally. The deficiency was on the whole most marked in Hyderabad and the Madras Deccan.

The following table gives the rainfall data of the 52 meteorological districts into which India is divided, and which are utilized as explained above in Plate V, which shows the variation of the rainfall from the normal in each district :—

Province.	Division.	Average actual rainfall of division.						Total rainfall during the month.	Normal average rainfall during the month.	Variation from normal.
		1st.	2nd to 8th.	9th to 15th.	16th to 22nd.	23rd to 29th.	30th and 31st.			
		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Burma	Tenasserim	1·38	17·73	8·08	9·00	7·50	3·53	47·22	39·04	+ 8·18
	Lower Burma	0·61	12·06	2·16	2·88	4·43	1·82	23·96	20·74	+ 3·22
	Central do.	0·47	8·10	5·44	3·01	1·55	1·60	20·17	20·18	— 0·01
	Upper do.	0·20	1·36	1·08	1·04	1·52	0·46	5·66	?	?
	Arakan	2·20	17·16	22·71	3·70	2·56	2·69	51·02	34·81	+ 16·21
Bengal and Assam	Eastern Bengal	0·64	1·77	3·89	1·88	1·68	0·41	10·27	17·66	— 7·39
	Assam (Surma)	0·62	4·18	5·11	5·46	4·24	1·87	21·48	31·86	—10·38
	Do. (Brahmaputra)	0·30	3·23	3·79	3·18	1·57	0·56	12·63	13·96	— 1·33
	Deltaic Bengal	0·44	2·06	5·36	1·30	1·05	0·51	10·72	12·29	— 1·57
	Central do.	0·51	1·67	3·92	2·14	0·90	0·33	9·47	12·06	— 2·59
	North do.	0·32	1·61	2·59	3·48	1·26	0·46	9·72	19·98	—10·26
	Orissa	0·22	5·88	4·35	2·67	2·66	0·76	16·54	11·08	+ 5·46
	Chota Nagpur	0·37	3·96	4·11	2·56	1·84	0·69	13·53	12·88	+ 0·65
	Behar (South)	0·31	2·71	3·97	1·89	0·61	0·27	9·76	10·92	— 1·16
	Do. (North)	0·34	0·73	3·80	1·94	0·64	0·28	7·73	11·67	— 3·94

Provinces.	Division.	Average actual rainfall of Division. 1st.	2nd to 8th.	9th to 15th.	16th to 22nd.	23rd to 29th.	30th and 31st.	Total rainfall during the month.	Normal average rainfall during the month.	Variation from normal.
		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
North-Western Provinces and Oudh.	North-Western Provinces (East)	0·14	3·30	8·62	4·00	0·94	0·61	17·61	10·47	+ 7·14
	Oudh (South)	0·11	3·69	3·61	9·07	2·29	1·10	19·87	10·32	+ 9·55
	Do. (North)	0·11	3·07	3·30	4·88	2·53	1·90	15·79	10·70	+ 5·09
	North-Western Provinces (Central)	0·20	3·09	3·62	5·99	4·37	0·58	17·85	9·94	+ 7·91
	Do. do. (West)	0·17	4·74	3·23	3·17	4·65	0·30	16·26	8·66	+ 7·60
	Do. do. (Submontane)	0·28	6·42	4·33	3·13	4·99	0·87	20·02	11·66	+ 8·36
Punjab	Punjab (South)	0·34	0·85	0·70	0·07	0·29	0·02	2·27	3·43	— 1·16
	Do. (Central)	0·28	5·51	3·46	1·02	1·45	0·10	11·82	5·62	+ 6·20
	Do. (Submontane)	0·38	3·45	0·63	1·31	1·95	0·04	7·76	7·41	+ 0·35
	Do. (Hill Districts)	0·71	12·48	5·51	4·42	6·16	0·38	29·66	18·64	+11·02
	Do. (North-West)	0·35	1·66	0·91	0·78	1·08	0·13	4·91	5·32	— 0·41
	Do. (West)	0·09	0·25	0·30	0·20	0·26	0·02	1·12	1·82	— 0·70
Bombay and Malabar Coast Districts (Madras).	Malabar	1·00	3·97	3·02	2·27	2·34	0·66	13·26	14·58	— 1·32
	Madras (South Central)	0·23	0·75	0·79	0·44	1·27	0·14	3·62	4·02	— 0·40
	Coorg	0·96	3·76	3·56	2·64	2·71	1·22	14·85	22·83	— 7·98
	Mysore	0·18	0·96	1·12	0·52	0·33	0·15	3·26	4·93	— 1·67
	Konkan	1·64	5·26	3·45	2·52	3·19	2·11	18·17	23·87	— 5·70
	Bombay Deccan	0·56	2·17	1·51	0·70	0·66	0·62	6·22	4·77	+ 1·45
	Hyderabad (North)	...	...	...	...	...	...	...	...	...
	Khandeish	0·30	1·40	0·28	0·12	1·43	0·91	4·44	4·78	— 0·34
Central Provinces and Berar.	Berar	0·21	1·94	0·29	0·09	1·82	0·92	5·27	7·81	— 2·54
	Central Provinces (West)	0·63	2·97	0·56	0·37	3·51	0·65	8·69	9·23	— 0·54
	Do. (Central)	0·99	5·75	1·59	2·37	3·38	0·82	14·90	12·67	+ 2·23
	Do. (East)	1·17	6·26	2·77	1·41	3·05	0·59	15·25	12·04	+ 3·21
Bombay (North)	Guzerat	1·93	2·85	1·12	0·22	3·57	0·70	10·39	9·22	+ 1·17
	Kathiawar	1·00	0·71	0·04	0·02	0·20	0·10	2·07	3·82	— 1·75
	Sind	0.06	0	0	0	0·01	0	0·07	1·42	— 1·35
Rajputana and Central India.	Central India (East)	0·43	·75	1·35	2·75	5·04	0·58	12·90	9·47	+ 3·43
	Rajputana (East) Central India (West)	0·53	·75	0·83	0·70	1·16	0·03	5·00	7·93	— 2·93
	Rajputana (West)	0·58	·14	0	0	0·32	0	1·04	4·24	— 3·20
Madras	East Coast (North)	0·07	0·70	0·52	2·20	2·07	0·41	5·97	5·37	+ 0·60
	Do. (do.) (a)	0·62	2·65	2·55	5·95	2·31	0·59	14·67	13·85	+ 0·82
	Hyderabad (South)	0·04	0·14	0·21	1·37	0·34	1·28	3·38	5·99	— 2·61
	Madras (Central)	0·01	0·05	0·71	0·26	0·21	0·28	1·52	4·87	— 3·35
	East Coast (Central)	0·03	0·30	0·63	0·63	0·72	0·25	2·56	5·53	— 2·97
	Do. (South)	0·04	0·06	0·92	0·29	0·52	0·13	1·96	4·67	— 2·71
	Madras (South)	0	0	0·35	0·20	0·17	0	0·72	2·35	— 1·63

The month of August was one of daily rain in Arakan, Tenasserim, and Lower Burma, and of almost daily rain in Central Burma. The periods of heaviest rainfall was from the 1st to the 7th and from the 20th to the 30th. Falls exceeding five inches in 24 hours were recorded on at least one occasion at several stations in Arakan. As a rule the falls were moderately heavy. The rainfall of the month was excessive in Arakan, which received an average of 51·02 inches, or 16·21 inches in excess of the normal average. The rainfall of the month was in moderate excess in Tenasserim and Lower Burma and normal in Central Burma. It varied very largely in Upper Burma, and was considerably in defect at the following stations, and hence probably in the districts in which they are situated:—

District.	Station.	Total rainfall.	Variation from normal.
		Inches.	Inches.
Minbu	Minbu	2·35	—3·59
	Salin	1·14	?
Pakokku	Pakokku	0·97	?
Myingyan	Myingyan	0·91	—2·75
	Pagan	1·85	—0·48
Lower Chindwin	Monywa	1·72	—1·39
Sagaing	Sagaing	1·21	—3·39
Mandalay	Mandalay	1·95	—2·81

The rainfall in these districts had been scanty during the previous months of the monsoon, and a portion of the

area including the districts of Myingyan, Minbu, Sagaing, and Lower Chindwin suffered severely from the drought.

In Assam the rainfall of the month was much smaller in amount than is generally the case. It is usually a month of steady daily rain. In August 1891 there were three short breaks or periods of little or no rain in the province. These were from the 1st to the 3rd, the 15th and 16th and the 27th to the 29th. The most noteworthy feature of the precipitation of the month was the absence of heavy falls. Thus the largest amount recorded in one day-at-Cheerapoonji was only 4·00 inches.

The total rainfall was more or less in defect over-the whole of the province. The defect was large in Sylhet, which received barely half its normal. It was moderate in amount in the Brahmaputra valley, being greatest in the western districts and least in the eastern districts. There was a slight excess in some parts of Sibsagar. The following gives data for the more important districts :—

District.	Rainfall.			Number of rainy days.		
	Actual.	Normal.	Variation from normal.	Actual.	Normal.	Variation from normal.
	Inches.	Inches.	Inches.			
Sylhet	15·32	23·09	—7·77	16	22·2	—6·2
Cachar	17·91	17·97	—0·06	19	19·8	—0·8
Goalpara	10·54	12·23	—1·69	14	14·9	—0·9
Kamrup	9·28	11·61	—2·33	12	13·0	—1·0
Darrang	9·67	10·03	—0·36	12	11·8	+0·2
Nowgong	11·27	14·64	—3·37	14	17·1	—3·1
Sibsagar	16·91	14·26	+2·65	16	16·3	—0·3
Lakhimpur	13·32	17·44	—4·12	17	17·8	—0·8

The defect was even more marked in the Khasi and Jaintia hills than in the Assam plains. Cheerapoonji only received 32·22 inches during the month, its average amount being 75·83 inches.

The chief periods of rainfall in the North-Western Provinces were from the 6th to the 10th, the 14th to 16th, the 18th to the 22nd, and the 26th to the 30th. The first burst of heavy and general rainfall was in part due to the cyclonic storm of the first week of the month, and in part to-a-strong inrush of moist winds from the Arabian Sea. The rainfall was heaviest in-the Aligarh, Bulandshahr, Meerut, Bijnor, Muzaffernagar, Saharanpur, Tarai and Kumaon districts. The following rainfalls in 24 hours exceeding 6 inches were registered during this period :—

District.	Station.	Rainfall of 24 hours preceding 8 A. M. of date.	Date.
		Inches.	
Tarai	Kashipur	10·76	5th.
Kumaon	Naini Tal	9·12	"
Saharanpur	Roorkee	7·20	"
	Hardwar	6·40	"
Bijnor	Najibabad	7·10	"
Bulandshahr	Dayanatpur	7·60	"
Shaharanpur	Shaharanpur	8·60	7th.
	Nakur	6·80	"
Aligarh	Balanpur	7·50	9th.
	Aligarh	6·16	10th

The second burst of rainfall was due to a cyclonic storm which formed in Central Bengal and advanced into the eastern and central districts of the North-Western Provinces. The rainfall due to that storm was hence most general and largest in amount in the eastern districts of the North-Western Provinces and in Oudh. The following rainfall in 24 hours exceeding 6 inches in amount was recorded during this storm :—

District.	Station.	Rainfall in inches.	Date.
Allahabad	Phulpur	6·10	15th.
	Handia	6·70	"
Cawnpore	Bilhaur	6·60	"
Hardoi	Sandila	7·71	"
Mirzapur	Robertsganj	6·25	"
Fatehpur	Kalianpur	6·00	"
Lucknow	Lucknow	6·02	16th
Sultanpur	Sultanpur	8·15	17th

The third burst was chiefly due to a large influx of humid winds from the Bengal and Bombay coasts. It gave excessive rain to the Allahabad and neighbouring districts and generated a small cyclonic whirl in that area on the 18th and 19th, which drifted very shortly westwards into the Jhansi and Lalitpur districts, where it broke up on the 22nd. The rainfall during this period was exceptionally heavy in the Allahabad, Hamirpur, Banda, Fatehpur, Cawnpore, Lalitpur and Jhansi districts. The following gives the heaviest rainfalls :—

District.	Station.	Rainfall in inches.	Date.
Allahabad	Allahabad	10·07	19th
	Handia	6·60	"
Fatehpur	Kora	9·30	"
Cawnpore	Bilhaur	6·87	"
	Cawnpore	7·43	"
	Narwal	7·20	"
Allahabad	Allahabad	7·01	20th.
	Handia	6·00	"
Hamirpur	Mahoba	6·50	21st.
Jhansi	Barwasagar	7·10	"
Lalitpur	Narhat	7·33	"
	Lalitpur	8·60	22nd.

The last burst of general rainfall of the month, *viz.*, from the 26th to the 30th was due to indraught from both coasts and was chiefly determined in its distribution by a depression which advanced from the eastern districts of the Central Provinces to the central districts of the North-Western-Provinces. This depression was more diffused and of larger extent than the previous, and hence gave more general and moderate rainfall. Some very heavy

rainfalls were nevertheless registered, of which the following were the most remarkable:—

District.	Station.	Rainfall in inches.	Date.
Cawnpore	Bilhawar	13·65	28th.
Budaun	Dataganj	6·40	"
Furrukhabad	Kanauj	9·67	27th.
Pilibhit	Amaria	8·00	29th.
Bareilly	Baheri	10·09	"
	Nawabganj	9·60	"
	Bareilly	6·70	"
	Karor	6·68	"
Moradabad	Bilhari	6·50	"
Tarai	Rudarpur	10·00	"

The rainfall was very heavy in the Cawnpore, Bareilly, Moradabad, Pilibhit and Tarai districts on the 29th, or when the storm was approaching the Kumaon hills and breaking up.

The rainfall of the month was hence more or less largely in excess throughout the province. The following gives data:—

	Division.	Rainfall in Inches.		
		Actual average.	Normal average.	Variation.
North-Western Provinces.	(East)	17·61	10·47	+7·14
	(Central)	17·85	9·94	+7·91
	(West)	16·26	8·66	+7·60
	(Sub-montane)	20·02	11·66	+8·36
Oudh	(North)	15·79	10·70	+5·09
	(South)	19·87	10·32	+9·55

In the eastern districts of Gorakhpur, Basti, Gonda, Fyzabad, Azamgarh and Ballia the rainfall of the month was very slightly above the normal. Over nearly the whole of the western and southern districts it was largely in excess and was from two to three times its normal amount in many districts. Bilhawar in the Cawnpore district received 47·89 inches, its normal being only 8·82 inches, and Allahabad 31·37 inches, its normal being 9·39 inches. The following table gives data for those districts in which the rainfall was most excessive:—

District.	Rainfall of month. In Inches.		Number of rainy days.	
	Actual average.	Normal average.	Actual average.	Normal average.
Allahabad	23·27	9·88	16	12·0
Cawnpore	22·48	9·87	16	11·0
Lalitpur	16·42	12·12	16	13·2
Hamirpur	17·68	9·42	16	11·8
Jhansi	16·00	11·14	14	13·3
Bareilly	23·99	11·01	20	11·7
Moradabad	25·60	10·85	19	12·1

In the Punjab there were three periods of general rainfall, *viz.*, from the 4th to the 11th, the 16th to the 20th and the 23rd to the 28th. The rainfall of the first of these periods was very heavy in the Gurgaon, Rohtak, Delhi, Karnal, Umballa, and Gurdaspore districts, and in the hill districts of Simla and Kangra. The following gives the more remarkable rainfalls during this period:—

District.	Station.	Rainfall.	Date.
		Inches.	
Gurgaon	Gurgaon	10·20	5th
	Palwal	7·05	"
Simla	Kasauli	6·30	"
Delhi	Delhi	7·15	6th
	Ballabgarh	6·30	"
	Sonepat	6·00	"
Karnal	Panipat	6·24	"
Umballa	Naraingarh	6·23	"
Simla	Simla	10·67	"
	Kasauli	7·00	"
Kangra	Palampur	12·50	"
	Dera	7·67	"

The rainfall of the month was largely in excess in the districts which received heavy rain during the first week of the month. The following gives data for these districts:—

District.	Rainfall in Inches.				
	Actual average.	Normal average.	Variation from normal.	Maximum in district.	Minimum in district.
Gurgaon	13·62	6·41	+7·21	20·55	4·29
Delhi	20·74	6·66	+14·08	25·48	17·42
Karnal	13·31	5·31	+8·00	17·23	5·60
Umballa	14·98	9·58	+5·40	25·06	8·03
Simla	16·72	14·52	+2·20	33·36	3·40
Kangra	21·59	20·13	+1·46	47·10	7·55

These figures illustrate a feature common to the whole province, *viz.*, its irregularity in every district. The rainfall was in excess in all districts, except Amritsar and the western districts of Dera Ismail Khan, Dera Ghazi Khan and Mooltan, where there was a slight deficiency. The following gives mean data for the six meteorological districts into which the province is divided:—

District.	Rainfall in Inches.			Number of rainy days.		
	Actual average.	Normal average.	Variation from normal.	Actual average.	Normal average.	Variation from normal.
Punjab. South	2·27	3·43	— 1·16	3	4·3	—1·3
Central	11·82	5·62	+ 6·2	8	6·2	+1·8
Sub-montane	7·76	7·41	+ 0·35	8	8·1	—0·1
North West	4·91	5·32	— 0·41	8	7·9	+0·1
West	1·12	1·82	— 0·70	3	2·7	+0·3
Hill Districts	29·66	18·64	+11·02	18	15·5	+2·5

The chief periods of rainfall in Rajputana were from the 3rd to the 10th and from the 25th to the 28th. Fairly general rain was received in the eastern districts on the 15th and 16th and again on the 21st. The rainfall of the

month was considerably in excess in the eastern states of Bhurtpore and Dholpore. Bhurtpore received an average of 11 inches and Dholpore of 9½ inches. The normal rainfall of the month in these districts is probably 8 inches. The rainfall diminished rapidly in amount westwards, and was small in amount and considerably below the normal in the central and western districts. The following gives data for representative stations in this area of partial drought during the month :—

State.	Station.	Rainfall.		
		Actual, August 1891.	Normal, August.	Variation from normal.
		Inches.	Inches	Inches.
Ulwar	Ulwar	3·02	10·57	−7·55
Jeypore	Jeypore	3·06	7·57	−4·51
Ajmere	Ajmere	1·22	7·76	−6·54
Jodhpur	Pali	0·31	7·03	−6·72
	Pachpadra	0·76	3·78	−3·02
	Jodhpur	0·32	5·50	−5·18
Jeysalmere	Jalmere	0·41	2·39	−1·98
Bikaneer	Bikaneer	0·91	3·47	−2·56
Oodeypore	Oodeypore	3·13	7·71	−4·58
Sirohi	Sirohi	1·34	7·37	−6·03

The preceding figures indicate that over the whole of Western and Central Rajputana the rainfall of the month was very seriously in defect, and that a considerable portion of the area received only from 5 to 20 per cent. of the normal fall of the month. The deficiency was relating to the normal greatest in the western districts.

The periods of rainfall in the eastern districts of Central India were practically identical with those of the North-Western Provinces, and rain was received almost daily during the month in Baghelkhund and Bundelkhund. The latter district shared in the very heavy rainfall of the third storm of the month on the 20th and 21st. The heaviest burst of rain in that district was between the 6th and 9th and 20th and 21st, during which period falls of 5 to 8 inches were received.

In the western districts rainfall was smaller in amount. Showers were received between the 1st and 10th. This was followed by a long break lasting until the 23rd. From that date to the end of the month general and heavy rain fell over the whole of Central India.

The rainfall of the month was very considerably in excess in Bundelkhund and Baghelkhund and East Gwalior. It was irregularly distributed in the western districts, but was generally below the normal. The chief feature in the area was the excessive rainfall in some parts of Rewah and Bundelkhund. Thus Orchha in the latter district had a total of 32·65 inches and Bardi in Rewah of 28·07 inches.

The Bombay current gave less rain than usual to nearly the whole of the Peninsula.

The Central Provinces and Berar had frequent moderate rain. The chief periods of rainfall were from the 1st to the 7th and from the 23rd to the 27th. The cyclonic storms of the month took a more northerly course than usual, and hence the Central Provinces (excepting the more eastern districts) received no cyclonic rainfall. Rainfalls in 24 hours exceeding six inches were registered at only three stations in the province during the month :—

District.	Station.	Rainfall in 24 hours.	Date.
Seoni	Lakhnadon	8·10	4th.
Saugor	Kurai	6·30	21st.
Hoshangabad	Hoshangabad	6·33	5th.

There was a fairly well-marked break in the rains between the 11th and 17th.

The rainfall of the month was somewhat irregularly distributed, but was generally in moderate excess. The only districts in which it was considerably in defect were Wardha and Chhindwara, for which data are given in the following table :—

District.	Rainfall in Inches.		
	Actual Average.	Normal Average.	Variation.
Wardha	4·10	8·46	−4·36
Chhindwara	5·15	7·77	−2·62

The following gives comparative data for the Central Provinces and Berar :—

Division.	Rainfall in Inches.		
	Actual average.	Normal average.	Variation.
Berar	5·27	7·81	−2·54
Central Provinces (West)	8·69	9·23	−0·54
Central Provinces (Central)	14·90	12·67	+2·23
Central Provinces (East)	15·25	12·04	+3·21

This shows that the excess in the amount of the rainfall diminished from east to west, and that in the more western districts and in Berar the rainfall was in defect to a moderate extent.

The rainfall of the month was very generally deficient in the Bombay Presidency. Sind was practically rainless throughout the month, receiving barely 5 per cent. of its normal amount. There was a local excess in Guzerat and in the Bombay Deccan, but in the Konkan (and probably the West Ghats) the rainfall of the month was almost universally in defect by

moderate amounts. The following gives data for the Bombay Presidency:—

METEOROLOGICAL DISTRICT.	Average actual rainfall, August 1891.	Average normal rainfall, August.	Percentage ratio of actual to normal.
	Inches.	Inches.	
Sind	0·07	1·42	5
Kathiawar	2·07	3·82	54
Guzerat	10·39	9·22	113
Konkan	18·17	23·87	77
Bombay Deccan	6·22	4·77	130

Hyderabad received frequent light showers during the month. The only days of fairly general rainfall were the 20th, 30th and 31st. Some very heavy downpours were received during the last period (*i.e.*, on the 30th and 31st), the most remarkable being a fall of 10·66 inches at Mominabad in the Bheer district. The rainfall of the month was in moderate excess in the Warungul, Nulgoonda, Sirpur. Tandur, Aurangabad and Bheer districts, and was in moderate defect in other districts. The average rainfall of the whole state was 6½ inches nearly, or one inch below the normal rainfall. The rainfall was more or less deficient over Southern Mysore and Coorg, which obtained barely two-thirds of their normal amount. The deficiency was very small in the Malabar coast districts.

In Madras there was a slight excess in the northern districts of Ganjam Godavari, and Kistna, but elsewhere there was a general deficiency, the amount relatively to the normal increasing southwards and being most marked in the districts of Coimbatore, Salem, Madras and Tinnevelly. The following gives data for the Madras Presidency based on the weekly telegrams of the district officers, as the monthly rainfall statement has not yet been received:—

METEOROLOGICAL DISTRICT.	Average actual rainfall, August 1891.	Average normal rainfall, August.	Percentage ratio of actual to normal.
	Inches.	Inches.	
Madras, East Coast, North	5·97	5·37	111
Madras, East Coast North (*a*)	14·67	13·85	106
Madras, Central	1·52	4·87	31
Madras, East Coast (Central)	2·56	5·53	46
Madras, East Coast South	1·96	4·67	42
Madras, South Central	1·22	3·49	35
Madras, South	0·72	2·35	31

The preceding data show that over the greater part of the presidency the rainfall was less than half the normal amount, and in Madras South, including the districts of Tinnevelly and Madura, it was less than onehird of its normal amount.

Explanation of Tables.

Table I gives an abstract of the meteorological observations at 8 A.M. daily, taken at 161 stations in India during the month of August 1891.

In this table the observing stations are grouped under two sets of divisions. According to the first arrangement India and Burma are divided into eleven large meteorological areas or provinces. These divisions have been selected in consultation with the Medical Department. The climatic conditions of each area are fairly uniform, and they hence are presumed to form suitable areas for the discussion of the relations between disease and meteorology. The names of these divisions are printed in bold type, and the mean variations of the more important meteorological data, more especially temperature, are given opposite to each in prominent figures.

Each of these larger divisions is sub-divided into smaller meteorological areas or districts, of which there are 51 in all. This sub-division was made in consultation with the Revenue and Financial Departments. In each of these smaller areas the distribution and character of the rainfall are fairly uniform, and the staple crops in each are hence the same. This sub-division will, it is hoped, enable a more exact comparison to be made between crops and rainfall than has been hitherto possible.

The headings of the columns in the great majority of cases explain themselves. The figures in the third column "variation from normal" are obtained by taking in each case the difference between the mean actual barometer (reduced for temperature, but not to sea-level or constant gravity) and the normal means obtained from the observations of the eleven years' period, 1878-88.

The "mean daily temperature" is assumed in Table I to be the mean of the maximum and minimum. It is chiefly utilized in order to obtain the mean variation of the temperature of the month from the normal.

In obtaining the figures for the column headed "Number of rainy days," a rainy day is assumed to be one on which a fall of a tenth of an inch or upwards has been recorded

A fall of less than a tenth of an inch is practically of no value for agricultural purposes in India, and it has not been found possible to secure the accurate record of rainfalls of less than a tenth of an inch at a great majority of the rainfall-recording stations.

Table II gives an abstract of the observations recorded at 10 A.M. and 4 P.M. at 89 second-class observatories throughout India, Burma, and the adjacent regions. This table is intended in part to supplement Table I, and hence information given in full in the latter table, as, for example, rainfall, is not included in Table II. This table is intended to give for the month, so far as is possible, all the information furnished hitherto in the Appendix A of the Annual Report on the Meteorology of India. The methods of calculating the means have been very fully explained in the Annual Reports, to which the reader is referred for complete information. The data of the mean daily pressure, the figures of which are given in the sixth column, are the means of the 10 and 16 hours' observations, with corrections obtained from a comparison of the 10 and 16 hours' observations at the same or a neighbouring observatory, with a series of hourly observations at the same observatory.

The mean temperature is calculated by the formula $\text{mean} = \frac{\textit{maximum} + \textit{16 hours} + 2\ \textit{minimum}}{4}$ by applying a constant correction for each month, derived from the hourly observations of the same or of a neighbouring station.

The mean daily vapour tension and humidity are the averages of the values for 10 A.M., 4 P.M. and the minimum readings, and the mean daily cloud is the average of the mean amounts for 10 and 16 hours.

The mean wind direction for each month is the trigonometrical resultant of the winds given under each of the eight cardinal points, and is calculated by means of Lambert's formula, in which an equal weight or value is given to every wind.

It should be noted that in the preceding discussion, in speaking of the maximum, minimum, or mean temperature, the total amount of wind or the rainfall of a given day, as, for example, the 5th, the maximum, etc., of the 24 hours preceding 8 A.M. of the 5th is meant. This definition has been adopted to avoid confusion. As the observations are taken at 8 A.M. a part of them refer to 8 A.M. of that day and a part to the previous twenty-four hours, and, therefore, including a portion of the previous civil day. It is found most convenient to use the same date to designate and define both classes of observations.

Table

Abstract of Observations taken at 8 A.M. at 161

Meteorological Province or District.	Station.	Height of Station in feet.	Pressure 8 A.M. in inches. 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.	Temperature of Air. 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.		...	...	−·012	...	...	...	...	...	...	...	84·1	+0·4	74·7	−0·3	79·4	+0·1	9·4	...	...	...	...	16·6
Bay Islands	Port Blair	61·16	29·794	?	29·786	29·867	15th	29·722	6th	·145	80·5	84·0	?	77·0	?	80·5	?	7·0	88·0	8th	73·7	29th	14·3
	Camorta‡	?	29·905	?	?	29·943	16th	29·831	27th	·112	80·7	84·8	?	76·7	?	80·8	?	8·1	87·7	14th	73·1	10th	14·6
Tenasserim	Mergui	96·27	29·787	?	29·814	29·835	9th	29·716	27th	·119	77·0	82·8	?	68·7	?	75·8	?	13·8	87·1	16th	67·2	12th	19·9
	Tavoy	26·26	29·877	?	29·837	29·927	20th	29·813	5th	·114	76·3	80·9	?	73·7	?	77·3	?	7·2	86·2	3rd	71·7	6th	14·5
	Moulmein	93·79	29·748	−·006	29·782	29·811	20th	29·671	27th	·140	77·0	83·3	+0·2	74·6	+0·8	79·0	+0·5	8·7	86·5	15th, 28th & 29th.	72·3	12th	14·2
	Toungoo	181·1	29·608	−·008	29·733	29·673	9th	29·523	1st	·150	78·4	86·7	+0·5	75·0	+0·1	80·9	+0·3	11·7	93·7	28th	70·2	9th	23·5
Lower Burma	Rangoon	40·69	29·773	−·014	29·752	29·836	9th	29·690	1st	·146	77·5	?	?	75·4	−0·4	?	?	?	?	...	73·4	4th	?
	Bassein	21	29·784	−·007	29·743	29·859	9th	29·677	1st	·182	77·9	84·7	+0·4	75·2	−0·5	80·0	−0·1	9·5	88·2	29th	72·9	6th	15·3
	Diamond Island.	41	29·768	−·013	29·746	29·843	15th	29·665	1st	·178	80·0	84·2	−0·2	71·7	−3·7	78·0	−2·0	12·5	86·9	16th & 27th.	69·0	4th	17·9
Arakan	Akyab	20·44	29·715	−·027	29·680	29·817	16th	29·474	1st	·343	79·5	85·2	+1·0	79·2	+2·1	82·2	+1·6	6·0	91·2	1st	76·1	27th	15·1
II.—Burma, Inland		...	...	−·009	...	...	...	...	...	...	...	91·1	+0·3	74·9	−2·0	82·1	+0·9	14·4	...	...	...	...	23·5
Central Burma	Thayetmyo	134	29·632	−·009	29·709	29·710	15th	29·518	1st	·192	80·2	89·1	+0·3	74·1	−2·0	81·6	+0·9	15·0	94·7	28th	72·5	11th	22·2
Upper Burma	Mandalay	?	29·503	?	?	29·607	30th	29·336	1st	·271	83·9	96·7	?	?	?	?	?	?	103·4	3rd	?	?	?
	Kindat	?	29·347	?	?	29·458	23rd	29·231	5th	·227	80·1	88·8	?	75·4	?	82·1	?	13·4	94·8	29th	73·0	23rd	21·8
	Bhamo	?	29·327	?	?	29·403	25th	29·181	5th	·222	78·9	89·8	?	75·1	?	82·5	?	14·7	96·6	30th	70·1	11th	26·5
III.—Assam		...	...	−·012	...	...	...	...	...	...	...	89·7	1·	77·9	0·4	83·8	0·7	11·7	...	...	...	...	20·9
Assam (Surma)	Silchar	104·3	29·598	−·018	29·654	29·718	26th	29·400	1st	·318	79·8	91·2	+2·0	77·1	+0·5	84·2	+1·3	14·1	99·1	4th	73·8	23rd	25·3
Brahmaputra	Sibsagar	333	29·363	−·020	29·649	29·476	26th	29·229	12th	·247	81·3	90·5	+0·5	78·4	+0·7	84·5	+0·6	12·1	96·6	4th	76·0	16th & 17th.	20·6
	Dhubri	115·34	29·566	+·002	29·634	29·691	25th	29·382	12th	·309	80·4	87·3	+0·5	78·3	+0·1	82·8	+0·3	9·0	91·7	3rd	74·8	19th	16·9
IV.—Bengal and Orissa		...	...	−·011	...	...	...	...	...	...	...	87·4	+0·3	77·6	+0·2	82·5	+0·2	9·9	...	...	...	...	18·9
East Bengal	Chittagong	86·7	29·618	−·019	29·652	29·720	15th	29·423	1st	·297	80·7	86·5	+1·5	76·2	+0·1	81·4	+0·8	10·3	91·2	1st	74·1	13th, 29th	17·1
	Lungleh	?	?	?	?	?	?	?	?	?	70·4	71·0	?	60·5	?	65·8	?	10·5	75·9	2nd	56·4	22nd	19·5
	Noakholly	42·73	29·643	?	29·633	29·768	25th	29·464	12th	·304	80·8	86·0	?	77·7	?	81·8	?	8·3	91·5	1st	74·8	12th	16·7
	Comillah	34·75	29·659	?	29·642	29·782	26th	29·476	1st	·306	80·3	88·3	?	76·6	?	82·5	?	11·7	94·3	2nd	73·8	13th & 29th.	20·5
	Serajganj	46·37	29·617	?	29·613	29·750	25th	29·429	12th	·321	81·4	88·1	?	78·5	?	83·3	?	9·6	93·6	2nd	75·2	31st	18·4
	Dacca	21·7	29·646	−·011	29·616	29·769	26th	29·475	1st	·294	81·5	88·1	+0·5	79·1	+0·2	83·6	+0·4	9·0	93·6	2nd	76·7	13th	16·9
	Burrisal	12	29·641	−·011	29·598	29·756	29th	29·461	2nd	·295	81·6	87·1	+1·8	77·8	+0·4	82·5	+1·1	9·3	93·3	2nd	69·9	12th	23·4
	Mymensingh	55·18	29·623	−·009	29·631	29·745	26th	29·444	12th	·301	80·7	87·6	0	77·9	+0·6	82·8	+0·3	9·7	93·2	2nd	74·1	19th & 25th.	19·1
Deltaic Bengal	Furreedpore	39	29·636	?	29·623	29·759	25th	29·434	12th	·325	81·9	87·4	?	78·9	?	83·2	?	8·5	93·0	2nd	75·4	13th	17·6
	Jessore	33·29	29·612	−·017	29·592	29·738	28th	29·409	12th	·329	82·3	88·4	−0·2	78·8	+0·1	83·6	−0·1	9·6	94·7	2nd	76·4	13th & 15th.	18·3
	Calcutta	21·38	29·609	−·017	29·576	29·740	29th	29·426	13th	·314	81·5	87·1	0	78·4	+0·3	82·8	+0·2	8·7	92·1	2nd	74·7	12th	17·4
	Saugor Island	25·3	29·602	−·024	29·571	29·734	29th	29·425	3rd	·309	81·5	86·9	−0·2	79·2	−0·4	83·1	−0·3	7·7	90·7	1st, 2nd 21st & 31st.	76·5	12th	14·2
	Kishnaghur	46·64	29·588	?	29·583	29·708	29th	29·398	12th	·310	82·3	89·4	?	78·6	?	84·1	?	10·8	94·8	2nd	76·2	15th	18·6
	Midnapore	148·88	29·483	?	29·577	29·614	29th	29·302	3rd	·312	81·2	89·1	?	77·9	?	83·5	?	11·2	94·3	2nd	74·1	12th	20·2
Central Bengal	Bankoora	300	29·315	?	29·563	29·448	29th	29·157	13th	·291	81·0	88·1	?	77·8	?	83·0	?	10·3	95·1	2nd	75·1	2nd	20·0
	Ranegunge	345·15	*29·307	?	*29·600	29·451	29th	29·146	13th	·305	*81·2	†88·3	?	†78·2	?	†83·3	?	10·1	94·0	2nd	75·9	12th, 14th & 15th.	18·1
	Burdwan	99·09	29·542	−·006	29·587	29·671	29th	29·358	13th	·313	81·7	89·2	+0·1	79·4	+0·5	84·3	+0·3	9·8	95·6	2nd	76·4	2nd	19·2

* Mean of 30 days.
† " 29 "
‡ Mean of last 23 days of month.

I.

stations in India, Burma, &c., in August 1891.

Wind Direction. Number of winds from									Wind Velocity.			Hygrometry, 8 A.M.			Rainfall.										
Calm.	N	NE.	E.	SE.	S.	SW.	W.	NW.	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 June to 31st August 1891.	Normal rainfall for period 1st June to 31st August 1891.	Variation from normal of period.	Station.	Meteorological Province or District.
...	...	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	28·57	28·29	+ 2·18	...	...	...	**I.—Burma Coast and Bay Islands.**	
2	...	...	...	...	1	16	12	...	12	10	+20	88	·912	8·7	21	...	...	21·81	15·20	+6·61	52·20	49·97	+2·23	Port Blair .	Bay Islands.
...	...	...	...	...	8	14	1	...	5†	?	?	84	·874	8·2	13	...	...	11·39	?	?	?	?	?	Camorta.*	
...	2	...	...	1	1	8	12	7	2	2	0	92	·858	9·7	31	...	...	38·24	28·85	+9·39	101·32	92·28	+9·04	Mergui .	Tenasserim.
16	1	1	...	...	1	6	1	5	2	?	?	93	·856	8·3	31	...	...	46·98	42·91	+4·07	152·75	129·46	+23·29	Tavoy.	
...	1	...	2	4	13	6	3	2	5	3	+67	94	·867	7·1	29	...	...	38·19	40·37	—2·18	151·73	124·46	+27·27	Moulmein.	
1	...	...	1	19	10	...	...	...	4	4	0	92	·900	8·6	22	...	...	13·96	20·11	—6·15	36·47	53·71	—17·24	Toungoo.	
...	...	...	...	...	4	17	9	1	5	5	0	95	·896	9·3	21	...	...	19·87	18·61	+1·26	73·59	58·65	+14·94	Rangoon .	Lower Burma.
6	...	...	...	2	12	8	3	...	5	3	+67	94	·907	7·8	27	...	...	23·26	23·07	+0·19	101·56	69·75	+31·81	Bassein.	
1	...	...	...	...	5	18	7	...	8	7	+14	86	·880	8·7	22	...	...	26·58	22·00	+4·58	91·19	71·44	+19·75	Diamond Island.	
...	...	2	8	5	13	3	...	...	4	3	+33	92	·934	8·7	26	...	...	45·41	43·53	+1·88	151·09	136·52	+14·57	Akyab .	Arakan.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	9·72	11·19	—1·47	...	...	...	**II.—Burma, Inland.**	
...	1	...	...	6	24	...	...	...	8	6	+33	85	·868	8·3	12	...	...	6·63	7·41	—0·78	19·92	21·32	—1·40	Thayetmyo .	Central Burma.
1	...	...	...	...	30	...	...	...	?	?	?	75	·868	7·4	5	...	...	1·95	5·00	—3·05	5·30	15·55	—10·25	Mandalay .	Upper Burma.
21	1	1	1	2	2	2	...	1	3	?	?	91	·943	3·2	17	...	...	13·92	17·05	—3·13	40·36	39·84	+0·52	Kindat.	
2	...	5	...	1	...	5	2	16	?	?	?	91	·894	7·7	19	...	...	16·38	15·31	+1·07	44·29	50·95	—6·66	Bhamo.	
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	15·51	16·02	—0·51	...	...	...	**III.—Assam.**	
28	...	...	1	...	1	...	1	...	1	3	—67	91	·928	9·4	24	...	...	21·81	20·36	+1·45	56·55	59·77	—3·22	Silchar .	Assam (Surma).
2	1	11	3	4	2	7	1	...	2	3	—33	92	·977	8·9	18	...	...	17·02	14·15	+2·87	44·75	42·73	+2·02	Sibsagar .	Brahmaputra.
7	...	2	7	4	1	8	1	1	5	3	+67	90	·930	7·7	12	...	...	7·70	13·55	—5·85	43·60	48·84	—5·24	Dhubri.	
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	11·45	13·91	—2·66		...	...	**IV.—Bengal and Orissa.**	
2	...	...	5	16	7	1	...	...	5	6	—17	87	·910	8·3	13	...	...	9·82	18·52	—8·70	49·90	62·38	—12·48	Chittagong .	East Bengal.
...	...	...	...	...	...	...	...	...	?	?	?	61	·694	?	26	...	...	18·08	?	?	69·03	?	?	Lungleh.	
...	...	...	13	15	1	1	...	1	9	?	?	89	?	3·3	22	...	...	12·57	23·22	—10·65	48·38	68·25	—19·87	Noakholly.	
...	...	...	10	12	9	...	...	...	4	?	?	88	?	4·6	17	...	...	8·49	16·47	—7·98	29·41	52·59	—23·18	Comillah.	
...	1	4	13	7	6	...	...	...	3	?	?	91	?	7·6	13	...	...	7·17	?	?	29·24	?	?	Serajganj.	
1	1	2	12	6	8	...	1	...	7	6	+17	90	·968	8·6	18	...	...	10·36	12·31	—1·95	37·96	37·19	+0·77	Dacca.	
...	6	...	1	8	8	2	5	1	4	?	?	88	·958	7·8	19	...	...	7·23	12·58	—5·35	29·99	44·62	—14·63	Burrisal.	
...	1	2	12	10	4	...	1	1	5	?	?	91	·957	7·6	17	...	...	10·47	13·95	—3·48	36·89	46·99	—10·10	Mymensingh.	
7	1	...	7	13	3	...	...	...	4	?	?	89	?	6·8	10	...	...	7·17	12·19	—5·02	31·97	37·99	—6·02	Furreedpore .	Deltaic Bengal
5	...	...	5	14	4	...	2	1	4	4	0	91	1·001	8·8	15	...	...	9·02	11·51	—2·49	27·50	35·75	—8·25	Jessore.	
1	1	1	10	7	4	3	4	...	5	5	0	90	·965	8·7	21	...	...	13·28	14·45	—1·17	27·49	36·51	—9·02	Calcutta.	
...	...	1	8	3	5	10	3	1	15	12	+25	91	977	8·9	19	...	...	21·07	18·10	+2·97	51·02	44·39	+6·63	Saugor Island.	
...	2	2	11	8	3	2	2	1	6	?	?	87	?	8·1	12	...	...	5·09	11·06	—5·97	25·04	30·83	—5·79	Kishnaghur.	
2	4	9	2	2	11	1	...	...	9	?	?	89	?	4·1	16	...	...	23·27	12·54	+10·73	36·42	34·59	+1·83	Midnapore.	
6	1	3	12	2	3	...	3	1	4	?	?	89	?	7·6	14	...	...	13·68	12·25	+1·43	29·06	34·77	—5·71	Bankoora .	Central Bengal.
2	2	3	10	5	4	1	2	1	3†	?	?	89*	?	3·7*	15	...	...	13·45	?	?	28·61	?	?	Raneegunge.	
4	1	...	13	3	2	3	4	1	4	4	0	86	·925	9·0	18	...	...	15·54	13·36	+2·18	32·39	33·11	—0·72	Burdwan.	

* Mean of last 23 days.
† " of 22 days.

Table

Abstract of Observations taken at 8 A.M. at 161 stations

Meteorological Province or District.	Station.	Height of Station in feet.	Pressure 8 A.M. in inches. 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.	Temperature of Air. 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.
Central Bengal —*contd.*	Nya Doomka	490	29·148	?	29·591	29·273	29th	28·998	13th	·275	81·9	87·9	?	77·4	?	82·6	?	10·5	92·6	2nd & 3r.	75·3	15th & 20th	17·3
	Berhampore	66·45	29·575	−·011	29·590	29·703	25th	29·403	13th	·300	81·2	89·1	+0·6	78·7	+0·2	83·9	+0·4	10·4	94·7	2nd	76·3	15th	18·4
	Rampore Bauleah.	70	29·575	?	29·594	29·693	25th	29·397	12th	·296	82·3	87·9	?	78·8	?	83·4	?	9·1	93·8	2nd	75·6	17th	18·2
	Maldah	80	?	?	?	?	?		?	?	84·1	91·2	?	79·5*	?	85·4*	?	11·7	95·4	2nd	76·5	14th	18·9
	Bogra	61·48	*29·577	+·006	29·589*	29·684	15th	29·409	12th	·275	82·4	88·9	+1·0	78·4	+0·4	83·7	+0·7	10·5	94·3	2nd & 3rd.	74·2	19th	20·1
North Bengal	Dinagepore	117·59	29·539	−·016	29·608	29·669	25th	29·371	12th	·298	82·3	89·7	+1·3	79·3	+1·1	84·5	+1·2	10·4	95·6	30th	76·2	19th	19·4
	Rungpore	123	29·556	?	29·632	29·678	25th	29·376	12th	·302	82·4	90·3	?	78·3	?	84·3	?	12·0	95·8	3rd	75·2	19th	20·6
	Jalpaiguri	283·7	29·386	+·011	29·619	29·526	25th	29·212	12th	·314	81·7	89·2	+1·3	76·8	+0·6	83·0	+1·0	12·4	93·9	3rd & 30th.	74·1	17th & 25th.	19·8
Orissa	Balasore	53·98	29·564	−·023	29·565	29·698	29th	29·293	3rd	·405	81·0	87·0	−0·1	77·8	+0·6	82·4	+0·3	9·2	94·4	1st	73·8	12th & 14th	20·6
	False Point	20·60	29·626	−·012	29·589	29·749	29th	29·397	3rd	·352	80·7	85·9	−1·1	76·9	−1·3	81·4	−1·2	9·0	91·5	1st & 19th	73·1	13th & 14th.	18·4
	Cuttack	80	29·565	−·008	29·588	29·688	29th	29·338	3rd	·350	81·5	87·1	−2·3	77·6	−0·6	82·4	−1·5	9·5	93·4	19th & 20th	72·8	14th	20·6
	Shortt's Island	?	29·597	?	?	29·716	29th	29·342	3rd	·374	81·4	86·1	?	78·1	?	82·1	?	8·0	91·0	19th	73·6	14th	17·4
	Pooree	11·99	29·623	?	29·572	29·737	29th	29·435	3rd	·302	80·5	86·1	?	78·4	?	82·3	?	7·7	93·7	1st	72·6	13th	21·1
V.—Gangetic Plain and Chutia Nagpur.		...	...	0	...	...	...	...	...	...	...	88·9	0	77·9	−0·2	83·4	−0·1	11·0	...	...	...	...	21·0
Chutia Nagpur	Hazaribagh	2,007·12	27·644	0	29·584	27·763	29th	27·530	3rd	·233	75·9	83·3	−0·3	72·9	0	78·1	−0·2	10·4	88·7	31st	69·8	13th	18·9
	Ranchee	2,128·14	27·517	?	29·572	27·648	29th	27·385	3rd	·263	75·4	82·5	?	72·3	?	77·4	?	10·2	87·0	31st	69·4	13th	17·6
	Chyebassa	760	28·861	−·004	29·564	28·993	29th	28·682	3rd	·311	79·7	87·7	−0·1	76·7	+0·2	82·2	+0·1	11·0	92·4	2nd	73·7	13th & 14th.	18·7
Behar (South)	Gya	374·5	29·252	0	29·578	29·367	29th	29·115	6th	·252	81·5	89·8	−0·3	78·5	0	84·2	−0·2	11·3	95·0	31st	73·8	13th & 14th.	21·2
	Dehree	351·14	29·266	?	29·568	29·395	29th	29·129	3rd	·266	82·4	89·2	?	78·3	?	83·8	?	10·9	96·3	2nd	74·0	13th & 14th.	22·3
	Patna	182·84	29·446	−·009	29·579	29·564	29th	29·316	12th	·248	83·7	90·3	+0·9	79·9	+0·4	85·1	+0·7	10·4	94·4	31st	75·7	13th	18·7
	Arrah	190·02	29·428	?	29·568	29·551	29th	29·313	12th	·238	83·3	90·2	?	79·3	?	84·8	?	10·9	95·4	2nd	75·1	13th	20·3
	Buxar	239·22	29·383	?	29·574	29·515	29th	29·264	7th & 12th.	·251	82·8	89·6	?	78·5	?	84·1	?	11·1	94·9	2nd & 7th.	74·3	13th	20·6
Behar (North)	Purneah	125	29·530	+·009	29·607	29·655	25th	29·373	12th	·282	82·6	90·5	+1·2	77·8	−0·2	84·2	+0·5	12·7	94·7	3rd	75·2	15th & 19th.	19·5
	Bhagalpur	159·78	29·472	?	29·584	29·590	25th	29·328	12th	·262	83·0	89·7	?	79·0	?	84·4	?	10·7	95·2	2nd	77·0	13th, 15th & 19th.	18·2
	Durbhunga	166·32	29·491	+·011	29·609	29·605	29th	29·346	12th	·259	83·0	90·5	+2·0	79·3	+0·1	84·9	+1·1	11·2	95·9	2nd	75·0	31st	20·9
	Mozufferpore	178·42	29·447	?	29·577	29·557	25th & 29th,	29·308	12th	·249	82·2	90·0	?	79·9	?	85·0	?	10·1	94·8	2nd	75·2	19th & 31st.	19·6
	Motiharee	223·61	29·411	?	29·591	29·517	29th	29·270	12th	·247	82·2	90·8	?	78·3	?	84·6	?	12·5	96·2	2nd & 31st.	73·8	25th	22·4
	Chupra	181·3	29·450	?	29·583	29·572	29th	29·327	12th	·245	83·2	90·3	?	78·9	?	84·6	?	11·4	95·8	2nd	72·7	14th	23·1
N.-W. P. (Eastern Districts).	Benares	266·97	29·348	0	29·572	29·454	25th & 29th.	29·244	5th	·210	81·3	89·6	−0·3	78·5	−0·3	84·1	−0·3	11·1	98·8	2nd	76·0	3 days	22·8
	Allahabad	309·28	29·297	−·011	29·562	29·414	29th	29·185	5th	·229	81·5	89·1	−0·7	77·7	−0·9	83·4	−0·6	11·4	95·4	2nd & 6th.	74·1	20th	21·3
N.-W. P. (Eastern Submontane).	Gorakhpur	255·93	29·369	+·005	29·585	29·496	25th	29·243	12th	·253	82·0	89·5	−0·9	78·5	−0·5	84·0	−0·7	11·0	97·3	2nd	74·2	26th	23·1
Oudh (South)	Lucknow	369·4	29·250	−·001	29·579	29·361	25th	29·134	12th	·227	81·7	89·4	−1·3	77·9	−0·7	83·7	−1·0	11·5	100·3	2nd	74·3	20th	26·0
N.-W. Provinces (Central).	Cawnpore	415·57	29·190	?	29·564	29·300	25th	29·070	5th	·230	81·5	87·8	?	77·7†	?	82·9†	?	10·1	97·0	5th	73·6	19th	23·4
VI.—Upper Sub-Himalayas		...	...	+·018	..	...	...	...	...	...	..	89·7	−2·6	76·4	−1·2	83·0	−1·9	13·3	..	...	...	...	27·4
N.-W. Provinces (Submontane).	Bareilly	568·47	29·050	+·012	29·584	29·160	25th	28·919	12th	·241	80·2	87·8†	−2·5	77·1	−1·0	82·5†	−1·8	10·7	97·9	4th	73·6	2 days	24·3
	Debra Dun	2,232·4	27·443	?	29·623	27·559	26th	27·269	12th	·290	74·2	83·0	?	72·0	?	77·5	?	11·0	90·0	3rd	68·5	14th	21·5
	Roorkee	886·63	28·746	+·019	29·603	28·880	25th	28·568	12th	·312	78·9	88·1	−2·9	76·0	−1·2	82·1	−2·1	12·1	99·7	3rd	71·1	25th	28·6
	Meerut	737·48	28·889	+·023	29·593	29·018	26th	28·746	12th	·272	79·5	86·8	−4·1	76·2	−2·4	81·5	−3·3	10·6	95·1	4th	71·9	2 days	23·2
Punjab (Central)	Delhi	717·81	28·904	+·018	29·587	29·025	25th	28·739	12th	·286	80·2	87·6	−4·3	78·2	−1·0	82·9	−2·7	9·4	96·0	3rd & 4th.	75·1	5 days	20·9
	Lahore	702·2	28·896	+·022	29·563	29·054	26th	28·694	12th	·360	84·6	96·2	−0·3	78·7	−0·7	87·5	−0·5	17·5	102·3	26th	71·9	2 days	30·4

* Mean of 29 days.
† „ „ 30 „

I—*continued.*

in India, Burma, &c., in August 1891—continued.

Wind Direction. Number of winds from									Wind Velocity.			Hygrometry, 8 A.M.		Mean cloud amount.	Rainfall.									Station.	Meteorological Province or 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 31st August 1891.	Normal rainfall for period 1st June to 31st August 1891.	Variation from normal of period.		
2	2	3	10	8	4	...	1	1	6	?	?	85	?	4·5	16	...	...	14·86	13·78	+ 1·08	30·02	36·39	− 6·37	Nya Doomka.	Central Bengal—*contd.*
1	3	3	17	3	2	1	1	...	4	4	0	94	·995	8·8	11	...	...	5·30	12·23	− 6·93	19·27	31·00	−11·73	Berhampore.	
...	1	1	10	12	4	3	...	...	4	?	?	89	?	5·9	11	...	...	5·83	10·55	− 4·72	31·73	32·63	− 0·90	Rampore Bauleah.	
2	...	5	12	12	...	...	...	...	3	?	?	86†	?	4·7	7	...	...	3·40	10·13	− 6·73	21·79	30·66	− 8·87	Maldah.	
4	...	2	11	12	...	...	...	...	4	?	?	87	·966	6·2	13	...	...	5·82	12·21	− 6·39	24·50	39·69	−15·19	Bogra.	
...	...	3	26	2	...	...	...	...	2	?	?	88	·972	6·4	7	...	...	3·04	12·26	− 9·22	28·35	42·00	−13·65	Dinagepore.	North Bengal.
2	1	...	19	5	4	...	...	...	3	?	?	88	?	2·7	8	...	...	4·90	12·97	− 8·07	36·75	50·08	−13·33	Rungpore.	
Not observed.									4	?	?	91	·987	1·9	14	...	...	12·81	24·47	−11·66	42·54	78·50	−35·96	Jalpaiguri.	
5	5	2	2	1	3	9	2	2	6	?	?	93	·985	5·0	17	...		16·42	12·61	+ 3·81	32·05	35·37	− 3·32	Balasore.	Orissa.
2	...	...	1	1	5	9	10	3	11	10	+ 10	89	·935	9·2	13	...	...	17·41	13·25	+ 4·16	34·00	32·59	+ 1·41	False Point.	
6	...	3	1	...	1	11	7	2	3	3	0	81	·867	8·2	22	...	...	20·98	13·35	+ 7·63	32·35	35·53	− 3·18	Cuttack.	
...	1	...	3	1	3	10	9	2	12	?	?	87	·931	7·9	12	...	...	13·36	?	?	25·02	?	?	Shortt's Island.	
10	4	2	...	...	1	5	7	2	10	?	?	88	?	8·2	16	...	...	14·49	11·23	+ 3·26	18·43	28·88	−10·45	Pooree. ‡	
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	12·25	11·67	+ 1·06	...	...	...	**V.—Gangetic Plain and Chutia Nagpur.**	
1	...	1	8	7	4	...	7	3	10	8	+ 25	91	·812	9·4	20	...	...	14·09	13·94	+ 0·15	29·13	34·28	− 5·15	Hazaribagh.	Chutia Nagpur.
10	...	4	2	2	...	3	9	1	9	?	?	87	?	9·3	20	...	...	10·62	12·21	− 1·59	21·47	32·54	−11·07	Ranchee.	
8	1	5	3	3	...	6	4	1	2	?	?	88	·893	9·0	18	...	...	17·99	13·72	+ 4·27	31·33	35·88	− 4·55	Chyebassa.	
...	...	...	17	...	6	1	7	...	5	3	+ 67	88	·948	6·6	17	...	...	12·21	13·42	− 1·21	25·96	33·01	− 7·05	Gya.	Behar (South).
2	2	...	9	7	1	6	3	1	9	?	?	85‡	?	6·6	15	...	...	3·60	?	?	12·41	?	?	Dehree.	
...	...	1	24	...	3	...	2	1	6	3	+100	84	·968	8·7	9	...	...	5·77	12·08	− 6·31	23·51	31·84	− 8·33	Patna.	
...	2	4	12	7	2	...	2	2	2	?	?	88	?	4·1	15	...	...	5·37	10·45	− 5·08	18·00	29·61	−11·61	Arrah.	
1	...	3	19	...	...	1	5	2	10	?	?	87	?	7·1	14	...	...	8·13	10·11	− 1·98	12·38	26·44	−14·06	Buxar.	
10	1	9	6	3	1	1	...	...	2	2	0	88	·979	6·7	8	...	...	3·78	14·67	−10·89	18·69	39·56	−20·87	Purneah.	Behar (North).
10	...	3	8	7	2	1	...	...	2	?	?	88	?	7·7	10	...	...	6·80	10·73	− 3·93	28·98	30·58	− 1·60	Bhagalpur.	
...	...	5	14	10	...	1	...	1	5	5	0	86	·971	6·2	13	...	...	14·71	12·57	+ 2·14	30·72	33·18	− 2·46	Durbhunga.	
1	...	2	13	10	2	1	2	...	6	?	?	89	?	5·8	14	...	...	6·68	10·17	− 3·49	27·81	28·38	− 0·57	Mozufferpore	
...	...	11	14	5	...	...	1	...	7	?	?	86	?	7·2	15	...	...	14·83	12·08	+ 2·75	33·57	32·20	+ 1·37	Motiharee.	
...	1	2	19	4	1	...	2	2	5	?	?	89	?	5·5	10	...	...	6·47	9·31	− 2·84	18·38	26·29	− 7·91	Chupra.	
4	1	5	7	2	1	5	5	1	5	4	+ 25	89	·956	8·2	16	...	...	11·59	11·98	− 0·39	16·55	27·31	−10·76	Benares.	N.-W. P. (Eastern Districts).
6	3	3	7	1	1	2	6	2	7	4	+ 75	89	·953	8·4	18	...	...	30·49	10·45	+20·04	35·55	26·51	+ 9·04	Allahabad.	
3	...	2	14	6	3	1	2	...	2	2	0	87	·961	4·7	16	...	...	17·75	10·76	+ 6·99	43·57	32·21	+11·36	Gorakhpur.	N.-W. P. (Eastern Submontane).
4	3	5	11	2	1	1	4	...	4	3	+ 33	87	·944	8·5	16	...	...	19·15	11·13	+ 8·02	23·22	26·22	− 3·00	Lucknow.	Oudh (South).
2	2	7	6	3	1	1	6	3	5	?	?	90	·975	8·6	17	...	...	22·72	10·21	+12·51	27·51	23·29	+ 4·22	Cawnpore.	N.-W. Provinces (Central).
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	15·61	11·33	+ 4·28	...	...	...	**VI.—Upper Sub-Himalayas.**	
20	...	1	1	6	...	2	...	1	1	4	− 75	90	·930	7·1	22	...	...	28·05	13·36	+14·69	36·62	35·50	+ 1·12	Bareilly.	N.-W. Provinces (Submontane).
25	...	1	1	1	2	...	...	1	1	1	0	91	·775	8·7	23	...	...	18·54	27·19	− 8·65	35·27	65·40	−30·13	Dehra Dun.	
20	1	...	...	7	3	...	...	...	2	3	− 33	88	·864	7·1	18	...	...	22·94	12·72	+10·22	32·07	30·33	+ 1·74	Roorkee.	
11	2	...	9	5	...	2	2	...	2	2	0	86	·871	7·7	15	...	...	21·11	9·97	+11·14	23·48	22·07	+ 1·41	Meerut.	
12	...	...	4	5	...	4	6	...	3	4	− 25	86	·882	7·4	17	...	...	18·40	8·72	+ 9·68	24·08	21·63	+ 2·45	Delhi.	Punjab (Central).
8	...	2	6	10	2	2	1	...	3	3	0	74	·878	3·4	4	...	...	5·70	5·41	+ 0·29	7·62	13·82	− 6·20	Lahore.	

‡ 29 days' wind direction observations. † 30 days' wind direction observations.

Table

Abstract of Observations taken at 8 A.M. at 161 stations

Meteorological Province or District.	Station.	Height of Station 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.
Punjab (Submontane).	Ludhiana	811·86	28·795	+·011	29·573	28·926	30th	28·599	12th	·327	82·0	93·3	−2·6	77·3	−1·8	85·3	−2·2	16·0	101·3	4th	74·1	2 days	27·2
Punjab (North)	Sialkot	829·47	28·771	+·018	29·572	28·911	26th	28·577	12th	·334	81·2	91·6	−2·8	76·5	−1·0	84·1	−1·9	15·1	100·2	13th	70·8	28th	29·4
	Rawalpindi	1,648·9	27·967	+·019	29·546	28·133	30th	27·764	12th	·369	80·2	92·5	−1·3	75·2	−0·1	83·9	−0·7	17·3	105·0	5th	64·2	9th	40·8
VII.—Indus Valley and N.-W. Rajputana.		...	...	+·018	...	...	...	..	..	...	...	99·9	+1·6	79·6	+0·3	89·8	+0·9	20·3	...	...	...	...	32·6
Punjab (West)	Peshawar	1110·4	28·510	+·039	29·543	28·722	29th	28·288	5th	·434	84·3	99·1	−0·3	77·9	−0·2	88·6	−0·3	21·2	108·5	6th	70·9	9th	37·6
	Khushab	611·51	28·963	?	29·540	29·143	29th	28·745	12th	·398	84·8	115·9	?	77·2	?	96·6	?	38·7	125·1	3 days	72·0	2 days	53·1
	Montgomery	558·46	29·015	?	29·535	29·176	29th	28·833	5th	·343	87·2	102·1	?	81·1	?	91·6	?	21·0	110·4	25th.	69·2	8th	41·2
	D. I. Khan	572·56	28·980	−·001	29·518	29·170	28th	28·768	13th	·402	86·5	102·9	+1·2	81·9	+0·7	92·4	+1·0	21·0	109·5	6th	75·9	27th	33·6
	Mooltan	420·19	29·144	+·010	29·524	29·308	29th	28·961	5th	·347	87·7	102·8	+2·6	82·8	+0·8	92·8	+1·7	20·0	108·7	3rd	78·2	8th	30·5
	Sirsa	661·61	28·937	+·012	29·558	29·057	29th	28·781	2 days	·276	85·3	99·6	+2·1	80·9	+1·4	90·3	+1·8	18·7	106·4	25th	76·3	3 days	30·1
Sind and Cutch	Jacobabad	185·9	29·380	+·020	29·522	29·532	29th	29·191	6th	·341	85·9	106·5	+3·2	81·7	+0·4	94·1	+1·8	24·8	113·7	13th	75·7	28th	38·0
	Hyderabad	117·43	29·478	+·019	29·550	29·614	29th	29·290	6th	·324	81·6	97·8	+2·5	77·6	−0·9	87·7	+0·8	20·2	105·2	3rd	71·1	14th	34·1
	Kurrachee	49	29·611	+·027	29·613	29·743	29th	29·421	6th	·322	80·7	87·6	0	78·0	−0·4	82·8	−0·2	9·6	90·5	30th	75·8	3 days	14·7
	Bhuj	394·9	29·286	?	29·632	29·388	29th	29·129	7th	·259	81·0	90·2	?	76·7	?	83·5	?	13·5	97·0	30th & 31st.	74·3	20th	22·7
Rajputana (West)	Bickaneer	743·5	29·140	?	29·842	29·195	17th	29·094	1st	·101	86·3	99·0	?	81·9	?	90·5	?	17·1	103·1	5th & 25th	77·2	13th	25·9
	Pachpadra	380	29·256	?	29·589	29·386	19th	29·070	3rd	·316	82·4	95·3	?	77·8	?	86·6	?	17·5	101·5	31st	71·6	28th	29·9
VIII.—East Rajputana, Central India and Guzerat.		...	...	+·021	...	...	...	...	...	...	...	88·0	+0·7	75·9	+0·3	82·0	+0·5	12·1	...	...	..	...	21·6
Rajputana (East)	Jeypore	1430·6	28·228	+·018	29·618	28·310	20th	28·128	6th	·182	80·3	92·6	+2·8	76·3	+1·4	84·5	+2·1	16·3	100·1	25th	73·5	10th	26·6
	Sambhar	1253·52	28·387	+·019	29·600	28·470	24th & 25th.	28·283	5th	·187	80·7	93·0	+4·0	77·3	+1·6	85·2	+2·8	15·7	99·0	25th	72·9	9th	26·1
	Ajmere	1611	28·067	+·028	29·635	28·157	24th	27·962	5th	·195	79·5	91·6	+4·3	76·5	+2·2	84·1	+3·3	15·1	98·9	25th	73·1	12th, 13th.	25·8
	Deesa	465·5	29·233	+·031	29·656	29·317	25th	29·088	6th	·229	79·8	90·3	+2·2	75·8	+0·5	33·1	+1·4	14·5	97·3	30th	71·8	12th	25·5
Kathiawar	Rajkot	428·83	29·300	+·035	29·683	29·382	29th	29·161	7th	·221	79·7	89·7	+1·0	74·8	+0·2	82·3	+0·6	14·9	95·9	25th, 30th.	72·8	18th, 24th.	23·1
	Veraval	?	29·745	?	29·707	29·827	17th	29·612	7th	·215	80·1	82·9	?	78·2	?	80·6	?	4·7	86·8	30th	74·3	4th	12·5
	Bhavnagar	?	29·338	?	29·325	29·408	21st	29·228	6th	·180	81·8	91·4	?	78·2	?	84·9	?	13·2	94·9	22nd	76·5	29th	18·4
Central India	Nowgong	757·04	28·874	+·004	29·593	28·970	29th	28·799	4th	·171	78·3	85·7	−2·8	75·8	−1·0	80·8	−1·9	9·9	92·6	4th, 5th.	72·0	21st	20·6
	Sutna	1,040·1	28·574	−·011	29·579	28·676	29th	28·445	5th	·231	78·6	84·7	−0·9	74·5	−1·3	79·6	−1·1	10·2	94·1	6th	71·6	18th	22·5
	Indore	1,823·2	27·896	+·024	29·683	27·990	17th	27·811	5th, & 7th.	·179	73·7	81·0	−1·7	70·6	−0·7	75·8	−1·2	10·4	86·0	21st	69·1	28th	16·9
	Neemuch	1,630	28·058	+·020	29·653	28·143	16th	27·963	6th	·180	76·0	85·4	+1·0	72·8	+0·6	79·6	+0·8	12·6	89·3	22nd, 25th.	71·1	28th	18·2
Guzerat	Surat	36	29·742	+·044	29·723	29·826	17th	29·631	7th	·195	79·9	86·1	−0·6	76·9	+0·6	81·5	0	9·2	90·6	23rd, 24th.	73·5	28th	17·1
N.-W. P. (West)	Agra	555·44	29·086	+·022	29·604	29·184	25th	28·972	5th	·212	80·9	89·2	−1·2	77·7	−1·0	83·5	−1·1	11·5	100·5	4th	74·5	3 days	26·0
	Jhansi	840·13	28·781	+·014	29·580	28·879	16th	28·657	5th	·222	80·1	88·2	−0·1	77·1	+0·5	82·6	+0·2	11·1	97·5	5th	74·4	20th	23·1
IX.—Deccan	...	...	...	+·020	...	...	...	...	...	...	...	83·8	−1·2	71·7	−0·2	77·8	−0·7	12·1	...	...	...	...	20·2
Bombay (Deccan)	Belgaum	2,524	27·325	+·035	29·804	27·390	12th	27·263	31st	·127	69·7	75·2	−1·0	66·4	+0·2	70·8	−0·4	8·8	79·8	4th & 25th.	64·8	4 days.	15·0
	Sholapur	1,589·7	28·224	+·041	29·767	28·307	16th	28·142	Do.	·165	76·4	91·2	+2·7	70·8	+0·4	81·0	+1·6	20·4	96·7	18th	67·6	28th	19·1
	Poona	1,840·37	27·972	+·035	29·773	28·043	17th	27·879	7th	·164	74·0	81·9	+0·2	69·4	−0·1	75·7	+0·1	12·5	86·0	25th	67·4	23rd	18·6
Khandeish	Malegaon	1,430·12	28·345	+·043	29·739	28·419	16th	28·250	7th	·169	76·2	85·0	−1·2	71·6	+0·2	78·3	−0·5	13·4	90·4	24th	67·8	27th	22·6
	Ahmednagar	2,151·62	27·654	?	29·758	27·736	16th	27·574	7th	·162	74·3	85·2	?	69·1	?	77·2	?	16·1	92·3	25th	62·0	23rd	30·3
Berar	Akola	930	28·806	+·026	29·697	28·898	16th	28·727	3rd	·171	76·3	85·2	−2·0	72·9	−0·4	79·1	−1·2	12·3	91·4	17th	68·3	27th	23·1
	Amraoti	1,215·5	28·508	+·029	29·688	28·608	16th	28·413	4th	·195	75·4	85·0	−1·7	72·3	−0·2	78·7	−1·0	12·7	91·8	17th & 23rd.	68·8	27th	23·0

* Mean of 30 days.

I—*continued.*

in India, Burma, &c., in August 1891—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 June to date.	Normal rainfall for period since 1st June to date.	Variation from normal of period since 1st June to date.	Station.	Meteorological Province or District.
12	2	...	2	11	2	1	...	1	2	1	+100	81	·885	6·2	10	...	...	3·54	7·18	−3·64	7·90	20·85	−12·95	Ludhiana .	Punjab (Submontane).
7	7	3	9	1	1	...	1	2	3	2	+ 50	83	·881	5·0	13	...	...	11·22	8·81	+2·41	18·36	19·99	− 1·63	Sialkot .	Punjab (North).
3	1	3	1	13	3	2	...	5	2	2	0	80	·832	4·4	9	...	...	11·03	8·63	+2·40	12·97	17·41	− 4·44	Rawalpindi.	
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·90	2·50	−1·60	...	...	...	**VII.—Indus Valley and N.-W. Rajputana.**	
7	7	5	1	...	1	1	1	8	4	4	0	71	·835	3·4	2	...	...	0·67	1·82	−1·15	1·01	3·73	− 2·72	Peshawar .	Punjab (West).
1	2	15	6	1	3	...	1	2	5	?	?	72	·873	4·3	5	...	...	3·48	2·01	+1·47	5·89	5·57	+ 0·32	Khushab .	
1	1	1	3	6	10	7	2	...	9	?	?	63	·818	2·8	3	...	...	3·69	2·34	+1·35	6·95	6·69	+ 0·26	Montgomery.	
13	1	8	8	1	...	...	...	...	1	2	− 50	68	·862	1·8	...	...	...	0·03	1·54	−1·51	2·23	4·67	− 2·44	D. I. Khan.	
7	...	5	...	12	...	7	...	...	2	3	− 33	53	·682	1·2	1	...	...	0·22	1·33	−1·11	0·34	4·18	− 3·84	Mooltan.	
2	...	...	2	7	2	11	5	...	8	5	+ 60	71	·796	4·7	2	...	...	0·65	4·25	−3·60	5·22	10·19	− 4·97	Sirsa.	
5	...	...	6	16	3	1	...	...	4	4	0	65	·807	1·3	...	...	...	0·02	1·26	−1·24	0·42	2·81	− 2·39	Jacobabad .	Sind and Cutch.
...	...	...	...	...	1	29	1	...	17	14	+ 21	66	·709	5·7	...	...	...	0	2·88	−2·88	0·51	5·88	− 5·37	Hyderabad.	
...	...	...	...	...	...	7	23	1	17	17	0	79	·833	7·0	...	...	...	0	1·81	−1·81	0·01	5·57	− 5·56	Kurrachee.	
...	...	...	...	...	...	4	27	...	?	15	?	77	·811	6·4	1	...	...	0·41	3·54	−3·13	4·51	11·17	− 6·66	Bhuj.	
...	...	4	...	1	8	17	1	...	10	6	+ 67	58	·726	3·9	2	...	...	0·91	3·47	−2·56	3·51	8·72	− 5·21	Bickaneer* .	Rajputana (West).
...	...	...	...	...	7	15	7	1	10	10	0	65	·723	6·6	1	...	...	0·76	3·78	−3·02	7·91	7·11	+ 0·80	Pachpadra.*	
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	7·40	9·63	−1·38	...	...	...	**VIII.—East Rajputana, Central India and Guzerat.**	
2	...	2	..	2	21	1	15	7	5	5	0	76	·790	6·8	7	...	...	2·96	10·10	−7·14	9·90	22·02	−12·12	Jeypore .	Rajputana (East).
6	...	...	...	...	...	1	20	4	10	?	?	73	·774	5·2	6	...	...	3·79	8·45	−4·66	8·32	17·72	− 9·40	Sambhar.	
...	...	...	...	...	...	3	27	1	10	6	+67	75	·749	4·7	4	...	...	1·22	7·91	−6·69	5·09	18·47	−13·38	Ajmere.	
...	11	...	...	...	...	...	7	13	13	12	+ 8	80	·814	8·3	8	...	...	2·42	9·05	−6·63	10·99	21·57	−10·58	Deesa.	
...	...	...	...	...	...	9	22	...	13	12	+ 8	84	·843	8·3	5	...	...	1·90	5·65	−3·75	23·43	24·59	− 1·16	Rajkot .	Kathiawar.
...	...	...	...	...	...	11	20	...	12	?	?	87	·894	7·9	2	...	...	0·43	?	?	20·39	?	?	Veraval.	
...	...	...	...	...	4	26	1	...	17	?	?	82	·887	7·4	5	...	...	4·24	?	?	13·29	?	?	Bhavnagar.	
7	...	1	5	...	...	1	15	2	5	3	+66	89	869	9·1	13	...	...	18·14	15·43	+2·71	27·58	36·18	− 8·60	Nowgong. .	Central India.
...	5	3	...	2	4	2	14	1	10	8	+25	88	·859	8·0	15	...	...	15·99	11·80	+4·19	30·09	32·28	− 2·19	Sutna.	
...	1	...	...	...	1	7	16	6	5	6	−17	91	·758	9·5	9	...	...	8·54	7·46	+1·08	18·61	24·14	− 5·53	Indore.	
1	...	...	...	...	...	14	16	...	13	12	+ 8	85	·771	5·7	8	...	...	9·73	10·14	−0·41	15·93	24·71	− 8·78	Neemuch.	
...	...	...	...	...	...	20	11	...	?	13	?	88	·904	8·5	11	...	...	12·87	8·41	+4·46	55·25	33·06	+22·19	Surat . .	Guzerat.
3	2	3	...	6	2	...	12	2	4	7	−43	86	·905	8·5	12	...	...	8·73	8·54	+0·19	14·88	23·12	− 8·24	Agra . .	N.-W. P. (West).
3	4	5	...	2	3	4	5	6	4	4	0	85	·877	6·2	18	..	...	12·68	12·61	+0·07	16·58	30·69	−14·11	Jhansi.	
...	...	...	..	...	...	...	...	...	...	...	..	...	...	...	...	...	...	9·40	8·61	+0·75	...	...	...	**IX.—Deccan.**	
...	...	...	...	...	...	2	17	12	4	21	−81	92	·666	9·1	20	...	...	12·58	8·67	+3·91	33·07	31·87	+ 1·20	Belgaum .	Bombay (Deccan).
...	...	...	...	...	...	10	18	3	13	11	+18	73	·665	7·6	6	...	...	6·52	8·03	−1·51	10·08	18·10	− 8·02	Sholapur.	
...	...	...	...	...	...	3	27	1	14	14	0	82	·685	8·6	10	...	...	2·87	3·11	−0·24	11·88	14·43	− 2·55	Poona.	
...	...	...	...	...	...	11	19	1	12	10	+20	80	·722	7·6	7	...	...	4·32	4·16	+0·16	11·47	14·59	− 3·12	Malegaon .	Khandesh.
...	...	...	1	1	...	3	16	10	14	?	?	83	·702	6·9	6	...	...	3·37	4·36	−0·99	7·58	12·60	− 5·02	Ahmednagar.	
...	...	...	...	...	...	1	12	18	10	8	+25	84	·758	9·1	8	...	...	4·76	6·84	−2·08	15·86	23·87	− 8·01	Akola . .	Berar.
...	...	...	...	...	...	1	21	9	11	6	+83	85	·750	8·5	5	...	...	3·97	6·71	−2·74	14·37	25·09	−10·72	Amraoti .	

* Thirty days' wind direction observations.

Table

Abstract of Observations taken at 8 A.M. at 161 stations

Meteorological Province or District.	Station.	Height of Station in feet.	Pressure 8 A.M. in inches. 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.	Temperature of Air. 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.
Central Provinces (West).	Khandwa	1,043·71	28·677	+·028	29·689	28·770	16th	28·589	3rd	·181	75·9	83·6	−2·4	73·9	+0·2	78·8	−1·1	9·7	89·2	17th	70·1	27th	19·1
	Hoshangabad	1,020	28·685	+·020	29·675	28·790	16th	28·592	5th	·198	75·2	82·2	−3·1	72·7	−1·1	77·5	−2·1	9·5	88·3	21st	70·7	28th	17·6
	Nagpur	1,025	28·665	+·012	29·652	28·767	16th	28·568	4th	·199	77·7	85·7	−1·8	74·1	−0·5	79·9	−1·2	11·6	91·8	4 days.	72·1	5 days	19·7
Central Provinces (Central).	Sconi	2,030	27·649	−·007	29·657	27·750	16th	27·537	5th	·213	75·1	80·8	−2·6	71·4	−0·4	76·1	−1·5	9·4	85·1	17th&30th	69·1	17th	16·0
	Jubbulpore	1,327·02	28·330	+·010	29·623	28·430	16th	28·188	5th	·242	75·4	82·6	−2·2	73·2	−0·8	77·9	−1·5	9·4	87·4	3 days.	70·1	21st	17·3
	Saugor	1,751·5	27·903	+·005	29·625	27·995	16th	27·799	5th	·196	75·0	82·3	−1·2	72·6	0	77·4	−0·6	9·7	89·3	31st	70·1	21st & 22nd.	19·2
	Sehore	...	29·080	?	29·655	29·180	17th	29·000	6th& 7th	·180	75·3	82·8	?	71·3	?	77·1	?	11·5	88·0	31st	69·9	7th, 13th, 19th.	18·1
Central Provinces (East).	Raipur	960	28·688	−·003	29·613	28·791	16th	28·547	4th	·244	77·3	84·1	−2·2	74·5	−0·5	79·3	+1·4	9·0	90·0	31st	71·1	14th	18·9
Hyderabad (South).	Secunderabad	1,786·69	27·996	+·008	29·736	28·078	16th	27·915	31st	·163	75·6	88·4	+2·2	71·6	+0·9	80·1	+1·6	16·8	95·7	19th	69·4	26th & 28th.	26·3
X.—West Coast		...	...	**+·040**	...	...	...	...	...	...	...	**83·9**	**+1·2**	**73·9**	**+0·7**	**78·9**	**+1·0**	**10·0**	...	...	...	...	**14·8**
Konkan	Bombay	37	29·788	+·038	29·766	29·861	17th	29·692	7th	·169	80·4	84·1	+0·3	77·6	+0·9	80·9	+0·6	6·5	86·4	31st	74·0	5th	12·4
	Ratnagiri	110	29·745	+·047	29·795	29·807	17th	29·667	7th	·140	80·7	84·4	+1·0	74·7	−0·2	79·6	+0·4	9·7	86·4	5 days	73·4	21st & 22nd.	13·0
	Mormugao	?	29·816	?	29·812	29·875	17th	29·743	7th	·132	79·5	83·6	?	76·4	?	80·0	?	7·2	85·0	2nd & 9th.	73·4	12th	11·6
	Karwar	43·87	29·849	+·037	29.828	29·906	12th	29·783	31st	·123	78·6	83·5	+1·4	74·7	+0·7	79·1	+1·1	8·8	84·2	9 days	71·8	21st	12·4
Malabar	Mangalore	25·60	29·904	+·039	29·863	29·956	12th	29·840	31st	·116	77·7	84·1	+1·7	74·6	+0·8	79·4	+1·5	9·5	86·3	8th	72·4	12th	13·9
	Calicut	26·58	29·912	+·037	29·871	29·957	12th	29·851	6th	·106	77·3	83·6	?	74·1	?	78·9	?	9·5	86·3	15th	71·1	4th	15·2
	Cochin	11·03	29·944	+·044	29·884	29·985	12th	29·889	31st	·096	78·6	84·7	+1·7	75·1	+1·1	79·9	+1·4	9·0	87·2	6th	72·2	22nd	15·0
	Trivandrum	?	29·606	?	29·881	29·683	11th	29·552	31st	·131	77·3	83·2	?	63·8	?	73·5	?	19·4	86·0	3 days	61·5	12th	24·5
XI.—South India		...	...	**+·028**	...	...	...	...	...	...	...	**91·9**	**+1·9**	**75·8**	**+0·7**	**83·9**	**+1·3**	**16·1**	...	...	...	...	**24·0**
Madras (South)	Pamban	37	29·839	?	29·803	29·906	11th	29·753	6th	·153	83·2	89·4	?	79·9	?	84·7	?	9·5	91·8	29th	78·2	16th & 17th.	13·6
	Madura	446·60	29·418	+·032	29·800	29·488	11th	29·356	6th	·132	83·8	98·2	+1·3	76·8	+1·2	87·5	+1·5	21·4	104·0	30th	72·0	11th	32·0
Madras (South Central).	Salem	939·91	28·956	+·031	29·843	29·009	12th & 16th.	28·894	6th	·115	79·3	97·4	+6·0	74·1	+2·4	85·8	+4·2	23·3	100·4	14th	72·0	21st & 22nd.	28·4
	Coimbatore	1,347·64	28·531	+·032	29·834	28·585	16th	28·469	6th	·116	76·2	89·7	+1·4	70·7	+0·1	80·3	+0·8	19·0	91·3	3 days	68·1	9th	23·2
Coorg	Mercara	3,780·7	26·214	?	29·869	26·268	12th	26·162	31st	·106	64·2	69·6	−1·1	62·5	+0·2	66·1	−0·5	7·1	73·3	16th	60·7	3rd	12·6
Mysore	Bangalore	2,981·46	26·953	+·036	29·866	26·997	12th	26·893	31st	·104	70·3	83·4	+1·5	65·6	+0·2	74·5	+0·9	17·8	86·7	20th	63·0	28th	23·7
Madras (East Coast, South).	Negapatam	15	29·827	+·033	29·788	29·883	12th	29·768	6th	·121	83·6	97·3	+4·3	77·5	+0·5	87·4	+2·4	19·8	100·2	7th	72·7	19th & 27th.	27·5
	Cuddalore	12·44	29·822	?	29·765	29·897	16th	29·758	31st	·139	85·3	98·9	?	78·3	?	88·6	?	20·0	102·3	7th & 22nd	74·2	1st	28·1
	Trichinopoly	254·78	29·606	+·026	29·796	29·668	11th & 12th.	29·548	6th	·120	81·9	98·1	+2·2	77·5	+1·3	87·8	+1·8	20·6	101·1	11th	71·9	19th	29·2
	Madras	22	29·815	+·033	29·769	29·882	12th	29·739	31st	·143	85·0	97·7	+4·1	79·2	+1·9	88·4	+3·0	18·5	103·5	7th	74·5	1st & 12th.	29·0
Madras (East Coast, Central).	Nellore	70·82	29·717	?	29·724	29·793	16th	29·641	31st	·152	84·9	98·2	?	80·7	?	89·5	?	17·5	104·3	25th	75·1	12th & 30th.	29·2
	Masulipatam	15·0	29·748	+·011	29·700	29·819	16th	29·664	3rd	·155	81·3	93·8	+2·2	77·6	0	85·7	+1·1	16·2	100·7	17th	73·1	21st	27·6
Madras (Central)	Cuddapah	433·36	29·407	?	29·782	29·484	16th	29·320	31 t	·164	82·9	96·8	?	78·1	?	87·4	?	18·8	101·2	11th	73·2	31st	28·0
	Kurnool	923·45	28·896	?	29·768	28·981	16th	28·823	6th	·158	79·9	92·0	?	74·2	?	83·2	?	17·8	95·5	3 days	71·9	23rd	23·6
	Bellary	1,474·63	28·367	+·043	29·794	28·439	16th	28·285	31st	·154	78·5	91·7	+0·6	73·9	+0·5	82·8	+0·6	17·8	95·4	24th&30th	70·5	12th&15th	24·9
Madras (East Coast, North).	Rajahmundry	112	29·627	?	29·678	29·709	16th	29·528	3rd	·181	80·7	90·5	?	76·9	?	83·7	?	13·6	99·0	19th	73·6	24th	25·4
	Coconada	26	29·707	?	29·670	29·803	16th	29·605	3rd	·198	80·4	89·8	?	76·7	?	83·2	?	13·1	95·9	17th	72·6	25th	23·3
	Vizagapatam	31	29·670	+·003	29·640	29·774	16th	29·526	3rd	·248	83·9	88·0	+0·4	81·1	+0·7	84·6	+0·6	6·9	91·9	18th	78·9	3 days	13·0
	Gopalpur	21·45	29·634	?	29·597	29·745	16th	29·455	3rd	·290	81·8	85·2	−0·7	79·5	−0·9	82·4	−0·8	5·7	90·7	1st	77·3	13th	13·4
XII.—Hill Stations		...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Beluchistan	Quetta	5,502·26	24·510	+·050	?	24·625	2 days	24·335	6th	·290	74·8	91·5	+0·8	62·0	−0·2	76·8	+0·3	29·5	97·1	5th	51·9	31st	45·2
	Shebo	?	?	?	?	?	?	?	?	?	*75·6	*95·9	?	*70·5	?	*83·2	?	25·4	102·4	5th	55·1	30th	47·3
Northern India	Murree	6,343·86	23·778	+·040	?	23·876	29th	23·643	13th	·233	64·9	73·6	−0·7	†59·5	−1·8	†66·5	−1·3	14·1	80·6	5th	52·8	27th & 30th	27·8
	Simla	7274	22·974	+·015	?	23·061	30th	22·845	13th	·216	61·8	66·8	−3·6	59·3	−0·5	63·1	−2·1	7·5	71·6	3rd	57·0	27th&28th	14·6

* Mean of 23 days.
† " " 29 "

I—*continued.*

in India, Burma, &c., in August 1891—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 June to 31st August 1891.	Normal rainfall for period 1st June to 31st August.	Variation from normal of period.	Station.	Meteorological Province or District.
...	...	...	...	...	...	1	28	2	11	8	+ 38	84	·748	8·7	9	...	...	8·60	6·09	+2·51	23·50	22·21	+1·29	Khandwa	Central Provinces (West).
1	...	...	...	...	8	16	6	...	7	4	+ 75	94	·833	8·4	19	...	...	22·27	13·95	+8·32	38·41	41·91	−3·50	Hoshangabad	
...	1	...	...	...	...	9	18	3	9	6	+ 50	83	·784	8·8	12	...	...	5·59	9·88	−4·29	25·39	35·05	−9·66	Nagpur.	
...	2	1	...	...	...	10	10	8	3	5	40	92	·810	7·7	19	...	...	15·88	12·19	+3·69	49·94	41·09	+8·85	Seoni	Central Provinces (Central).
1	3	...	...	...	...	7	19	1	4	5	− 20	93	·818	9·6	19	...	...	17·80	14·39	+3·41	44·73	46·10	−1·37	Jubbulpore.	
...	3	3	...	...	...	6	17	2	6	4	+ 50	92	·800	8·5	21	...	...	12·56	12·32	+0·24	33·49	33·50	−0·01	Saugor.	
...	...	...	...	...	...	...	...	...	?	?	?	89	·784	7·9	15	...	...	9·97	?	?	?	?	?	Schore.	
2	1	...	...	1	...	14	13	...	12	7	+ 71	90	·839	9·5	18	...	...	15·75	11·25	+4·50	38·24	39·71	−1·47	Raipur	Central Provinces (East).
...	...	...	...	...	...	1	20	10	13	10	+ 30	78	·696	6·9	8	...	...	3·63	7·19	−3·56	8·58	19·02	−10·44	Secunderabad	Hyderabad (South).
...	...	...	...	...	...	...	...	.	...	...	...	...	...	...	...	...	...	10·63	19·21	−7·75	...	...	...	**X.—West Coast.**	
...	...	...	...	1	...	8	22	...	16	16	0	85	889	8·9	18	...	...	6·69	13·64	−6·95	53·16	61·42	−8·26	Bombay	Konkan.
...	...	...	...	...	3	10	16	2	11	10	+ 10	84	·875	7·4	24	...	...	10·83	24·42	−13·59	76·19	89·18	−12·99	Ratnagiri.	
...	...	...	...	...	...	...	21	10	13	?	?	87	·873	6·6	20	...	...	9·78	?	?	49·59	?	?	Mormugao.	
11	1	...	...	...	...	12	7	...	3	?	?	86	·841	7·3	25	...	...	14·20	25·02	−10·82	62·62	100·78	−38·16	Karwar.	
12	...	...	...	...	...	2	12	5	2	3	− 33	93	·880	7·1	23	...	...	11·07	22·52	−11·45	73·18	95·07	−21·89	Mangalore	Malabar.
14	5	3	...	...	...	...	1	8	10	?	?	89	·835	5·6	18	...	...	15·20	15·27	−0·07	70·66	79·03	−8·37	Calicut.	
5	3	12	1	...	...	1	2	7	5	?	?	87	·857	5·8	20	...	...	10·81	14·40	−3·59	54·74	66·26	−11·52	Cochin.	
...	18	11	1	..	...	...	...	1	13	?	?	85	·804	7·4	11	...	...	6·48	?	?	33·60	?	?	Trivandrum.	
...	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4·22	6·35	−1·89	...	...	...	**XI.—South India.**	
1	...	...	1	2	6	14	7	...	9	?	?	69	·783	3·8	0	...	...	0	?	?	0	?	?	Pamban	Madras (South).
...	2	...	1	...	...	8	5	15	4	4	0	59	·682	4·1	4	...	...	2·26	3·97	−1·71	4·38	6·20	−1·82	Madura.	
5	...	...	...	...	15	9	2	...	4	4	0	72	·730	3·8	2	...	...	1·39	8·21	+6·82	6·89	15·34	−8·45	Salem	Madras (South Central).
...	...	...	...	2	17	8	3	1	6	7	− 14	83	·756	4·3	1	...	...	0·52	1·30	−0·78	2·66	4·20	−1·54	Coimbatore.	
...	...	...	...	...	...	1	24	6	6	9	− 33	94	·540	9·4	26	...	...	20·72	26·24	−5·52	86·03	98·81	−12·78	Mercara	Coorg.
...	...	...	...	...	...	8	23	...	10	8	+ 25	79	·590	7·5	6	...	...	2·03	5·97	−3·94	13·80	13·38	+0·42	Bangalore	Mysore.
2	...	...	...	...	...	9	17	3	4	6	− 33	63	·728	5·5	3	...	...	1·05	4·06	−3·01	2·01	7·41	−5·40	Negapatam	Madras (East Coast, South).
...	1	...	...	...	2	9	11	8	3	?	?	72	·871	3·0	4	...	...	1·63	5·15	−3·52	2·42	9·13	−6·71	Cuddalore.	
...	...	...	...	...	...	4	22	5	11		+ 38	65	·706	6·0	4	...	...	6·33	4·29	+2·04	7·05	7·32	−0·27	Trichinopoly.	
...	...	...	...	...	1	5	24	1	8	7	+ 14	66	·800	6·1	6	...	...	2·63	4·88	−2·25	3·61	11·24	−7·63	Madras.	
...	...	...	...	...	...	2	...	29	13	?	?	66	·780	8·8	5	...	...	2·99	3·10	−0·11	4·54	6·72	−2·18	Nellore	Madras (East Coast, Central).
...	1	...	...	...	1	1	15	13	4	?	?	84	·895	7·2	12	...	...	5·26	7·01	−1·75	14·73	17·92	−3·19	Masulipatam	
...	1	...	...	...	...	3	12	15	?	?	?	64	·722	7·4	4	...	...	3·97	5·72	−1·75	8·05	12·07	−4·02	Cuddapah	Madras (Central)
15	...	...	...	...	...	3	13	...	?	?	?	71	·727	6·0	5	...	...	2·36	5·91	−3·55	6·73	14·17	−7·44	Kurnool.	
1	...	...	...	...	...	...	23	7	14	11	+ 27	70	·679	7·1	5	...	...	1·27	2·39	−1·12	3·83	5·94	−2·11	Bellary.	
4	...	...	...	...	...	...	11	16	?	?	?	82	·871	7·5	14	...	...	8·32	6·52	+1·80	14·94	18·26	−3·32	Rajahmundry	Madras (East Coast, North).
1	...	..	...	...	...	8	19	3	9	?	?	76	·787	6·4	8	...	...	5·53	5·42	+0·11	14·64	15·16	−0·52	Coconada.	
...	1	...	...	...	1	6	18	5	4	3	+ 33	72	·789	8·6	7	...	...	4·17	5·99	−1·82	11·08	14·68	−3·60	Vizagapatam	
2	4	...	...	...	5	14	2	4	11	8	+ 38	86	·929	5·6	14	...	...	7·83	8·18	−0·35	11·35	23·21	−11·86	Gopalpur.	
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	**XII.—Hill Stations.**	
31	...	...	...	...	...	...	...	...	1	4	− 75	53	·469	0·9	0	...	...	0·07	0·47	−0·40	0·07	1·20	−1·13	Quetta	Beluchistan.
10	...	...	1	...	1	5	7	1	7*	?	?	47*	·421*	1·0‡	0	...	...	0	?	?	...	...	...	Shebo.	
6	2	1	3	5	1	1	2	10	5	5	0	82	·516	6·3	12	...	...	13·56	14·07	−0·51	18·78	26·23	−7·45	Murree	Northern India.
16	2	4	2	3	3	1	...	...	?	?	?	92	·50	8·6		...	...	33·66	17·54	+15·82		42·10	+2·79	Simla.	

‡ Mean of 25 days.

Table

Abstract of Observations taken at 8 A.M. at 161 stations

Meteorological Province or District.	Station.	Height of Station 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.
Northern India —*contd.*	Mussooree	?	23·490	?	?	23·602	26th	23·350	13th	·252	63·1	69·8	+1·2	56·7	−3·3	63·3	−1·1	13·1	80·3	3rd	53·0	26th	27·3
	Ranikhet	6,068·75	23·977	+·001	?	24·071	30th	23·832	12th & 13th	·239	64·9	70·2	−2·4	61·7	−0·3	66·0	−1·4	8·5	77·5	2nd	57·0	28th	20·5
	Darjeeling	7,421·1	22·931	+·020	?	23·035	25th	22·790	12th	·245	61·1	65·5	−0·7	57·2	+0·4	61·4	−0·2	8·3	71·6	4th	55·1	24th	16·5
	Kalimpong	?	*25·899	?	?	26·037	25th	25·776	2nd	·261	‡70·0	‡76·6	?	‡66·8	?	‡71·7	?	9·8	81·3	4th	58·9	12th	22·4
Central India	Mount Abu†	3,945	†25·890	+·024	?	25·982	30th	25·773	6th	·209	65·8	72·1	+0·3	64·0	−0·2	68·2	+0·1	8·1	77·6	30th	60·9	23rd	16·7
	Pachmarhi	3,511	26·293	+·009	?	26·388	16th	26·195	5th	·193	68·5	73·0	−1·7	67·1	+0·2	70·1	−0·8	5·9	79·7	31st	64·7	13th	15·0
South India	Wellington	6,200	24·237	+·043	?	24·280	16th	24·187	31st	·093	64·7	72·2	+1·4	56·5	−0·8	64·4	+0·3	15·7	76·2	8th	51·7	20th	24·5
XIII.—Extra India		...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Persia	Bushire	?	29·569	?	29·538	29·721	29th	29·415	6th	·306	90·5	96·7	?	83·9	?	90·3	?	12·8	105·5	11th & 12th	78·9	30th	26·6
Arabia	Baghdad	14	29·221	?	?	29·332	21st	29·056	8th	·276	88·8	108·4	?	79·7	?	94·1	?	28·7	119·8	6th	74·2	15th & 28th,	45·6
	Aden	?	29·681	?	29·706	29·745	5th	29·545	11th	·200	83·8	91·6	?	78·5	?	85·1	?	13·1	95·9	27th	72·9	5th	23·0
	Perim	94·1	29·589	?	?	29·684	25th	29·484	11th	·200	88·4	96·3	?	86·5	?	91·4	?	9·8	109·4	29th	83·0	24th	26·4
Arabian Sea Islands.	Minicoy	73	‡29·964	?	29·899‡	30·009	16th	29·921	8th	·088	‡80·5	‡83·6	?	‡78·8	?	‡81·2	?	4·8	86·1	17th & 29th	74·9	24th	11·2
Africa	Zanzibar	10·5	30·124	?	30·124	30·186	2nd	29·999	28th	·187	73·9	79·7	?	‡72·1	?	‡75·9	?	7·6	82·7	30th	70·5	27th	12·2

* Mean of 29 days. † Mean of 21 days. ‡ Mean of 30 days.

I—*concluded.*

in India, Burma, &c., in August 1891—concluded.

Wind Direction. Number of winds from									Wind Velocity.			Hygrometry, 8 A.M.			Rainfall.										
Calm.	N.	NE.	E.	SE.	S.	SW.	W.	NW.	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 June to 31st August 1891.	Normal rainfall for period 1st June to 31st August 1891.	Variation from normal of period.	Station.	Meteorological Province or District.
...	2	2	10	4	2	1	4	6	?	8	?	93	·548	7·4	24	...	...	20·46	28·91	−8·45	36·58	68·02	−31·44	Mussooree.	Northern India —*contd.*
24	...	...	6	...	1	1	...	...	0	2	?	91	·558	8·9	20	...	...	23·35	12·73	+10·62	37·58	31·62	+5·96	Ranikhet.	
9	1	9	7	3	1	...	...	1	3	3	0	94	·510	8·6	21	...	...	22·27	29·74	−7·47	63·87	83·74	−19·87	Darjeeling.	
9	1	4	...	4	1	2	3	6	?	?	?	94.	·687‡	3·5	16	...	...	10·39	?	?	37·10	?	?	Kalimpong .	
...	...	...	...	...	1	4	12	4	10	11	−9	94	·592	5·0	14	...	...	10·31	23·40	−13·09	37·83	51·36	−13·53	Mount Abu .	Central India.
...	...	...	...	...	...	15	15	1	10	7	+43	93	·656	9·9	25	...	...	24·48	18·61	+5·87	58·80	56·83	+1·97	Pachmarhi.	
6	2	...	...	...	2	16	2	3	4	4	0	66	·408	4·2	3	...	...	3·25	3·65	−0·40	9·57	9·96	−0·39	Wellington .	South India.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	**XIII.—Extra India.**	
...	4	2	7	7	1	...	2	8	5	8	−37	66	·950	0	...	...	...	0	0	0	0	0	0	Bushire.	Persia.
...	14	6	10	1	...	...	...	...	10	?	?	47	·634	0·3	...	...	...	0	?	?	0	?	?	Baghdad.	Arabia.
7	...	1	2	1	8	11	1	...	9	11	−18	75	·868	3·8	0	...	...	0	·030	−0·30	0·70	0·31	+0·39	Aden.	
...	6	1	3	...	...	7	11	3	16	?	?	73	·983	2·7	0	...	...	0	?	?	?	?	?	Perim .	
...	...	...	...	...	...	14	16	...	19‡	?	?	82‡	·854‡	5·9‡	‡10	...	...	7·06	?	?	?	?	?	Minicoy .	Arabian Sea Islands.
...	...	...	2	4	17	6	2	...	?	6	?	85	·707	6·8†	2	...	...	1·14	?	?	?	?	?	Zanzibar .	Africa.

Table

Abstract of Observations recorded at 10 A.M. and 4 P.M at 89 stations

Station.	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 to 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.
Murree	23·796	23·766	·030	23·779	+ ·041	?	73·4	59·2	14·2	80·4	52·9	27·5	68·5	71·0	65·8	− 1·3	57·9	64·1	66·2	62·7
Chamba	26·714	26·636	·078	26·677	+ ·023	?	83·4	69·8	13·6	88·1	64·2	23·9	77·0	80·7	75·3	− 1·0	68·1	72·1	73·9	71·4
Kailang	20·723	20·657	·066	20·692	+ ·030	?	73·2	50·7	22·5	79·0	42·6	36·4	64·8	67·8	60·0	− 0·7	48·5	56·8	56·2	53·9
Simla	22·991	22·943	·048	22·965	0	?	66·9	59·3	7·6	71·6	57·0	14·6	63·5	64·7	62·7	− 1·1	57·9	61·8	62·8	60·8
Peshawar	28·517	28·397	·120	28·450	+ ·022	29·516	98·9	77·9	21·0	108·5	70·9	37·6	89·8	97·3	87·7	+ 0·1	73·0	78·6	78·0	76·5
Lahore	·909	·805	·104	·850	+ ·006	·512	96·3	78·7	17·6	102·3	71·9	30·4	88·9	91·7	86·8	+ 0·2	75·0	79·3	80·5	78·3
Ludhiana	·807	·707	·100	·751	+ ·004	·522	92·7	77·1	15·7	100·8	71·1	29·7	85·4	90·4	83·8	− 2·4	75·3	78·5	79·8	77·9
Mooltan	29·152	29·053	·099	29·095	+ ·001	·471	102·9	82·5	20·4	108·7	70·2	38·5	92·0	102·3	92·3	+ 2·6	71·8	77·0	82·4	77·1
Jacobabad	·388	·267	·121	·320	0	·459	106·7	81·6	25·1	113·8	75·9	37·9	94·0	104·6	93·3	+ 1·8	74·8	79·4	81·1	78·5
Hyderabad	·489	·393	·096	·444	+ ·005	·511	98·1	77·4	20·7	105·0	71·1	33·9	89·6	95·1	86·7	+ 1·3	72·5	74·3	75·4	74·1
Kurrachee	·619	·550	·069	·587	+ ·018	·589	87·7	77·9	9·8	90·5	75·7	14·8	84·1	84·6	81·7	− 0·4	74·2	77·0	77·4	76·2
Jeypore	28·243	28·145	·098	28·193	+ ·010	·566	92·8	76·3	16·5	99·9	73·7	26·2	84·4	90·1	83·2	+ 1·8	72·4	75·5	77·0	75·0
Ajmere	·076	27·985	·091	·027	+ ·009	·573	92·4	76·4	16·0	99·9	71·6	28·3	83·4	90·6	83·5	+ 3·8	73·0	74·8	77·5	75·1
Mount Abu	25·903	25·839	·065	25·869	+ ·004	?	72·5	64·0	8·4	77·7	60·5	17·2	68·4	71·6	68·0	+ 0·4	63·0	65·9	68·4	65·8
Chakrata	23·142	23·098	·044	23·118	− ·028	?	69·1	59·2	9·9	73·3	56·1	17·2	65·0	65·1	63·3	− 0·1	58·3	62·6	63·2	61·4
Ranikhet	·994	·942	·052	·953	− ·002	?	70·2	61·7	8·5	77·5	57·0	20·5	66·6	68·5	65·7	− 1·3	60·5	64·0	65·3	63·3
Pithoragarh	24·657	24·592	·065	24·610	+ ·047	?	75·7	64·0	11·7	83·2	58·6	24·6	70·2	73·7	69·4	− 1·2	63·1	67·7	69·1	66·6
Dehra	27·455	27·379	·076	27·410	+ ·012	·578	83·0	72·0	11·0	89·8	68·5	21·3	77·6	78·6	75·8	− 2·7	71·3	73·7	74·7	73·2
Roorkee	28·765	28·670	·095	28·713	+ ·019	·559	88·3	75·8	12·5	99·7	70·6	29·1	81·6	85·9	80·9	− 2·5	73·4	77·1	78·5	76·2
Meerut	·910	·821	·089	·859	+ ·028	·556	87·0	76·1	10·9	95·3	71·9	23·4	81·9	85·2	80·9	− 3·2	75·9	77·4	78·7	77·3
Agra	29·100	29·011	·089	29·053	+ ·029	·560	89·3	77·5	11·8	100·3	74·0	26·3	84·7	87·0	83·3	− 1·7	75·3	79·7	79·9	78·0
Lucknow	·264	·162	·102	·215	− ·006	·540	89·4	78·0	11·4	100·3	74·3	26·0	84·8	84·7	82·4	− 2·6	76·3	79·7	79·4	78·5
Allahabad	·311	·210	·101	·265	− ·008	·526	88·7	77·7	11·0	95·2	73·9	21·3	83·8	85·0	81·7	− 1·6	76·7	79·8	80·1	78·9
Ghazipur	·417	·303	·114	·364	+ ·013	·535	90·6	80·2	10·4	97·9	77·0	20·9	86·4	86·7	83·9	+ 1·3	77·7	81·1	80·4	79·7
Nowgong	28·882	28·803	·079	28·844	+ ·006	·552	85·9	75·8	10·1	93·1	72·0	21·1	80·9	82·5	79·7	− 2·3	74·7	77·3	78·1	76·7
Sutna	·586	·496	·092	·543	− ·006	·538	84·9	74·4	10·1	94·1	71·6	22·5	81·2	82·3	78·5	− 2·2	73·4	76·8	77·3	75·8
Durbhunga	29·505	29·388	·117	29·452	+ ·018	·579	90·2	79·3	10·9	95·6	75·0	20·6	85·9	88·3	83·9	+ 0·9	78·2	80·5	81·1	79·9
Patna	·457	·344	·113	·406	− ·010	·539	90·3	79·8	10·5	94·6	75·8	18·8	86·2	87·4	83·9	+ 0·3	·9	80·4	80·6	79·7
Hazaribagh	27·655	27·565	·090	27·612	− ·007	·547	83·4	73·0	10·4	88·9	69·8	19·1	78·8	80·7	77·1	− 0·2	72·2	74·9	75·4	74·2
Darjeeling	22·943	22·878	·065	22·914	+ ·015	?	65·4	57·2	8·2	71·7	55·1	16·6	62·6	63·2	60·8	+ 0·2	56·1	61·3	61·9	59·8
Pedong	25·177	25·098	·079	25·140	+ ·007	?	75·1	65·7	9·4	80·2	63·2	17·0	71·9	71·9	69·6	+ 1·0	64·5	69·5	69·5	67·9
Berhampore	29·586	29·472	·114	29·537	− ·012	·551	89·1	78·7	10·4	94·7	76·3	18·4	84·2	85·7	82·7	− 0·6	77·7	80·2	80·8	79·6
Burdwan	·555	·446	·109	·508	− ·005	·552	89·1	79·4	9·7	94·6	76·6	18·0	84·0	85·2	82·8	− 0·7	77·9	79·0	79·6	78·8
Calcutta (Alipore)	·620	·520	·100	·570	− ·025	·537	87·0	78·4	8·6	92·1	74·5	17·6	83·9	83·8	81·9	− 0·5	76·7	79·7	79·6	78·7
Calcutta (Chowringhee)	·626	?	?	?	?	?	89·1	78·4	10·7	94·0	74·6	19·4	84·9	?	?	?	77·4	81·1	?	?
Saugor Island	·614	·520	·094	·572	− ·018	·541	86·7	79·0	7·7	90·7	76·2	14·5	83·3	84·4	81·9	− 0·5	77·3	80·2	80·2	79·2
Dacca	·659	·549	·110	·610	− ·011	·578	88·1	78·9	9·2	93·7	76·6	17·1	83·9	85·5	83·1	+ 0·3	76·7	80·0	80·6	79·1
Chittagong	·628	·531	·097	·587	− ·016	·621	86·5	76·2	10·3	91·6	74·0	17·6	83·1	82·6	80·0	+ 0·3	75·0	78·8	79·0	77·6
Demagiri	Not recorded.				?	?	87·3	77·0	10·3	90·7	74·5	16·2	84·5	84·8	81·6	+ 2·3	?	?	?	?
Tura	Ditto.				?	?	84·7	73·1	11·6	89·6	70·5	19·1	79·4	81·6	78·2	+ 0·9	?	76·2	77·7	?
Dhubri	·575	·453	·122	·520	− ·012	·587	87·0	78·2	8·8	91·7	74·9	16·8	82·6	85·6	81·4	+ 0·6	76·6	79·2	80·1	78·6
Sibsagar	·365	·226	·139	·297	− ·034	·580	90·3	78·4	11·9	96·4	75·8	20·6	84·7	88·6	83·1	− 0·5	77·4	80·8	82·1	80·1
Silchar	·604	·475	·129	·549	− ·025	·603	90·8	77·0	13·8	99·1	73·5	25·6	83·7	89·0	83·7	+ 1·3	75·7	79·2	80·9	78·6

II.

in India, Burma, &c., in August 1891.

Vapour Tension.					Humidity.					Cloud.				Wind Direction.											Wind Steadiness.		Wind Velocity.		Station.
														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.	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.	
·472	·559	·598	·543	− ·012	93	80	78	84	+ 2	6·8	7·0	6·9	+ 0·5	20	...	3	2	16	7	2	1	11	S. 29° E.	S. 4° E.	18	12	121	115	Murree.
·671	·734	·760	·722	− ·023	91	79	73	81	− 1	7·4	7·3	7·4	+ 0·5	14	4	...	1	4	...	...	5	34	N. 45° W.	N. 33° W.	58	28	79	81	Chamba.
·324	·394	·354	·358	?	87	64	52	68	?	7·1	6·9	7·0	+ 0·6	...	1	...	1	1	7	23	13	16	S. 73° W.	S. 80° W.	65	61	63	31	Kailang.
·470	·536	·555	·519	− ·018	93	91	90	91	0	9·6	9·4	9·5	+ 0·8	15	2	4	5	9	15	1	4	...	S. 29° E.	S. 77° W.	37	28	?	?	Simla.
·756	·843	·720	·773	− ·002	79	60	41	60	− 1	2·6	2·6	2·6	− 0·2	2	9	28	10	1	2	3	...	7	N. 39° E.	N. 42° E.	60	54	96	96	Peshawar.
·824	·875	·854	·851	− ·015	84	65	53	67	+ 4	3·0	3·5	3·3	− 0·3	16	3	5	10	11	9	1	3	4	S. 61° E	S. 83° E.	26	27	73	68	Lahore.
·857	·882	·873	·871	− ·003	92	72	61	75	+ 3	7·3	5·9	6·6	+ 1·0	26	6	1	9	8	6	...	4	2	S. 70° E.	S. 66° E.	16	10	44	33	Ludhiana.
·642	·730	·839	·737	− ·142	57	49	41	49	− 14	1·4	1·6	1·5	− 0·7	5	...	9	...	30	...	15	...	3	S. 32° E.	S. 19° W.	45	22	32	72	Mooltan.
·775	·810	·743	·774	− ·041	72	51	34	49	− 8	1·0	1·8	1·4	− 0·8	11	1	...	3	32	14	...	1	...	S. 35° E.	S. 50° E.	69	54	108	94	Jacobabad.
·735	·645	·618	·666	− ·124	78	46	37	54	− 10	5·3	5·4	5·4	+ 2·2	...	...	...	...	2	...	57	2	1	S. 46° W.	S. 43° W.	93	81	416	330	Hyderabad.
·799	·832	·848	·832	− ·020	83	71	71	77	− 1	6·3	5·3	5·8	− 1·0	...	...	...	...	...	...	22	39	1	S. 75° W.	S. 63° W.	92	84	417	410	Kurrachee.
·751	·770	·763	·761	− ·055	83	66	57	69	− 9	7·3	7·5	7·4	+ 0·3	1	2	7	3	1	1	6	27	14	N. 71° W.	N. 55° W.	55	42	121	128	Jeypore.
·772	·756	·779	·769	− ·011	85	66	56	69	− 7	4·2	4·3	4·3	− 1·9	2	1	1	1	...	...	5	45	7	N. 87° W.	S. 70° W.	83	56	240	136	Ajmere.
·568	·610	·659	·610	+ ·008	95	88	86	88	− 1	7·1	7·9	7·5	− 1·1	...	...	...	...	...	...	15	17	10	S. 56° W	S. 58° W.	83	72	234	259	Mount Abu.
·481	·545	·564	·530	− ·011	95	88	91	91	− 1	8·6	9·4	9·0	+ 0·2	4	...	7	9	3	7	14	16	2	S. 42° W.	S. 73° W.	27	43	102	104	Chakrata.
·517	·572	·592	·561	− ·010	94	88	85	89	+ 2	9·4	9·3	9·3	+ 0·8	47	...	...	8	...	2	5	...	...	S. 40° E.	S. 59° W.	11	33	6	49	Ranikhet.
·571	·656	·667	·631	0	95	89	81	88	+ 3	8·8	8·3	8·6	+ 0·7	48	...	3	...	1	...	10	...	...	S.	S. 15° E.	2	25	51	50	Pithoragarh.
·759	·784	·813	·785	?	97	83	84	88	?	7·7	8·0	7·9	+ 0·4	...	3	1	2	15	19	5	9	3	S. 3° W.	S. 43° W.	47	10	56	26	Dehra.
·794	·872	·879	·849	− ·014	89	81	72	81	+ 4	7·2	6·5	6·9	+ 0·6	37	1	1	3	11	2	...	5	2	S. 39° E.	S. 36° E.	13	27	46	60	Roorkee.
·893	·886	·900	·893	+ ·017	99	82	75	85	+ 9	8·0	6·7	7·3	+ 0·9	17	...	2	15	12	2	5	7	2	S. 49° E.	N. 80° E.	27	5	41	50	Meerut.
·850	·934	·927	·900	+ ·007	90	78	73	81	+ 5	8·4	7·7	8·1	+ 1·6	...	4	11	2	11	2	12	2	18	N. 43° W.	S. 22° E.	13	10	98	162	Agra.
·887	·949	·937	·924	+ ·011	93	80	79	84	+ 5	8·6	8·5	8·6	+ 1·1	...	6	16	18	4	3	6	4	5	N. 62° E.	S. 77° E.	37	12	79	72	Lucknow.
·906	·967	·964	·946	− ·004	95	84	81	87	+ 4	8·9	8·9	8·9	+ 1·4	5	2	9	8	9	3	2	14	10	N. 21° W.	N. 40° E.	8	4	170	91	Allahabad.
·920	·992	·956	·956	+ ·026	89	79	76	81	+ 1	7·6	7·0	7·3	+ 0·6	7	1	4	24	7	3	9	6	1	S. 62° E.	S. 50° E.	34	19	55	58	Ghazipur
·850	·894	·904	·883	+ ·025	95	85	81	87	+ 7	8·9	9·3	9·1	+ 0·7	3	3	5	14	...	...	...	33	4	N. 63° W.	S. 82° E.	34	38	102	81	Nowgong
·812	·868	·875	·852	+ ·025	95	81	79	86	+ 7	7·6	6·9	7·5	+ 0·7	1	6	5	5	3	5	2	28	7	N. 77° W	N. 70° W.	39	39	252	191	Sutna.
·952	·970	·966	·963	+ ·001	95	78	73	82	− 2	6·0	4·5	5·3	− 0·8	1	...	8	27	23	...	...	2	1	S. 78° E.	S. 82° E.	76	60	114	109	Durbhunga.
·934	·962	·956	·951	− ·006	91	77	74	81	− 2	8·6	8·1	3·3	+ 0·2	2	1	2	44	...	6	1	4	2	S. 86° E.	S. 19° E.	63	34	150	81	Patna.
·782	·813	·813	·803	0	96	82	78	86	+ 1	9·7	9·8	9·8	+ 1·0	...	1	3	21	12	7	1	9	8	S. 66° E.	S. 50° W.	29	7	230	180	Hazaribagh.
·439	·532	·545	·506	− ·001	93	93	93	93	− 1	9·4	9·1	9·3	+ 0·7	12	...	11	21	9	1	2	1	2	N. 89° E.	N. 84° E.	50	32	82	81	Darjeeling.
·598	·695	·694	·664	+ ·011	94	89	89	91	− 2	7·8	9·4	8·7	+ 0·9	...	2	7	11	12	4	...	...	...	S. 77° E.	?	40	?	?	?	Pedong.
·940	·979	·986	·969	+ ·017	96	83	80	87	0	8·6	7·8	8·2	− 0·6	...	3	4	32	8	8	5	2	...	S. 72° E.	S. 40° E.	59	45	99	101	Berhampore.
·940	·927	·938	·935	− ·014	93	79	78	83	− 1	8·6	8·6	8·6	+ 0·3	1	4	5	19	10	14	6	2	1	S. 53° E.	S. 27° E.	46	48	94	84	Burdwan.
·899	·959	·958	·939	− ·029	92	83	83	86	− 2	8·6	8·5	8·6	+ 0·4	...	1	2	15	18	12	8	5	1	S. 33° E.	S. 17° E.	52	57	121	125	Calcutta (Alipore).
·932	1·013	?	?	?	96	85	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	Calcutta (Chowringhee).
·915	·992	·977	·961	− ·033	92	87	83	87	0	8·7	8·6	8·7	+ 1·1	...	1	2	6	14	22	14	3	...	S. 6° E.	S. 17° W.	64	54	323	299	Saugor Island.
·890	·974	·979	·948	− ·026	90	84	80	85	− 2	8·5	7·4	7·9	+ 0·2	...	...	...	10	23	25	2	1	...	S. 29° E.	S. 14° E.	79	72	172	149	Dacca.
·856	·928	·944	·909	+ ·002	94	83	85	87	0	8·6	8·7	8·7	+ 1·3	4	...	2	3	20	22	8	2	1	S. 15° E.	S. 32° E.	66	55	111	146	Chittagong.
?	?	?	?	?	?	?	?	?	?	3·1	5·9	4·5	− 0·3	3	...	...	...	59	...	...	...	...	S. 45° E.	S. 23° E.	95	30	?	?	Demagiri.
?	·868	·907	?	?	?	86	84	?	?	6·1	5·8	6·0	− 0·9	...	...	4	4	19	5	21	9	...	S. 7° W.	S. 3° W.	50	59	?	?	Tura.
·896	·953	·953	·934	+ ·006	93	85	78	95	+ 9	6·6	6·7	6·7	− 0·6	17	2	5	8	7	6	15	1	1	S. 16° E.	S. 57° E.	25	20	117	78	Dhubri.
·929	1·002	1·010	·980	+ ·036	95	84	75	85	+ 1	8·0	7·2	7·6	− 0·9	2	1	21	5	9	1	22	1	...	S. 54° E.	S. 30° W.	19	12	47	64	Sibsagar.
·874	·941	·947	·921	− ·001	94	82	70	82	− 3	8·8	8·7	8·8	+ 1·0	44	...	2	2	1	1	1	6	5	N. 69° W.	S. 63° W.	11	7	20	71	Silchar.

Table

Abstract of Observations recorded at 10 A.M. and 4 P.M. at 89 stations

Station.	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 to 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.
False Point	29·638	29·544	·094	29·597	−·024	29·559	85·7	76·8	8·9	91·3	72·9	18·4	83·0	83·3	80·3	−1·3	75·9	79·1	79·2	78·1
Cuttack	·573	·483	·090	·535	−·015	·558	87·0	77·5	9·5	93·4	72·8	20·6	84·0	85·0	81·3	−1·3	75·5	77·9	78·5	77·3
Sambalpur	·176	·076	·101	·133	−·002	·541	85·7	76·7	9·0	92·5	71·7	20·8	81·0	82·9	80·6	−0·9	74·5	77·7	78·5	76·9
Raipur	28·701	28·595	·106	28·646	−·004	·549	84·6	74·4	10·1	90·9	71·0	19·9	80·2	82·1	79·2	−0·8	75·1	72·7	76·0	76·6
Khandwa	·689	·595	·093	·640	+·026	·639	83·0	73·9	9·1	89·2	70·1	19·1	78·2	81·6	77·5	−0·9	71·0	73·5	73·9	72·8
Hoshangabad	·697	·600	·096	·647	+·015	·625	82·3	72·8	9·5	88·3	70·9	17·4	77·9	81·0	76·6	−1·8	72·4	75·5	77·2	75·1
Saugor	27·918	27·826	·092	27·871	+·009	·574	82·5	72·5	10·0	89·3	70·0	19·3	77·9	79·9	76·3	−0·2	71·6	74·8	75·6	73·9
Jubbulpore	28·343	28·250	·093	28·295	+·010	·572	82·8	73·2	9·6	88·9	70·2	15·7	78·3	80·2	76·8	−1·3	72·1	75·1	75·8	74·3
Pachmarhi	26·307	26·231	·076	26·267	+·004	?	73·2	67·0	6·1	79·8	64·7	15·1	69·4	71·7	69·0	−0·7	?	67·7	69·1	?
Seoni	27·670	27·566	·104	27·616	−·007	·574	80·9	71·1	9·8	85·1	69·1	16·0	76·3	77·2	74·9	−0·8	69·4	73·3	74·3	72·4
Nagpur	28·670	28·565	·105	28·616	+·006	·589	86·0	74·4	11·6	92·0	72·4	19·6	80·5	82·7	79·7	−0·6	70·7	75·1	75·8	73·9
Chanda	29·102	·995	·107	29·047	+·021	·625	86·3	73·6	12·7	92·9	70·0	22·9	81·3	83·1	79·4	−1·5	72·2	74·6	75·5	74·1
Sironcha	·335	29·232	·103	·282	−·012	·627	86·1	75·6	10·5	91·1	71·9	19·2	81·2	83·2	80·5	−0·8	73·8	76·3	78·0	76·2
Chikalda	26·178	26·111	·067	26·143	+·004	?	70·5	64·5	6·0	74·5	62·1	12·4	67·0	69·3	66·5	−1·2	64·4	66·4	67·8	66·2
Buldana	27·635	27·545	·090	27·588	+·016	·653	80·7	69·2	11·5	85·5	65·0	20·5	76·2	78·0	74·6	−0·9	67·0	70·8	71·7	69·8
Akola	28·819	28·712	·107	28·763	+·024	·643	85·2	72·8	12·4	91·2	68·3	22·9	79·9	83·6	78·9	−0·7	70·8	74·2	75·1	73·4
Makhla	Not recorded.						73·2	67·0	6·2	77·1	64·9	12·2	69·8	71·0	69·9	−1·1	66·1	68·2	69·4	67·9
Deesa	29·241	29·139	·102	29·188	+·017	·603	90·7	75·8	14·9	98·3	72·7	25·6	83·4	88·9	82·6	+0·9	73·5	76·0	76·7	75·4
Bombay	·799	·727	·072	·760	+·034	·737	84·7	77·6	7·1	86·9	74·0	12·9	81·6	81·8	80·5	+0·6	74·9	77·5	77·4	76·6
Poona	27·981	27·909	·072	27·945	+·033	·733	81·6	69·5	12·2	86·0	67·3	18·7	76·5	77·5	73·5	−0·2	67·7	71·2	71·3	70·1
Sholapur	28·225	28·109	·116	28·174	+·024	·699	91·0	70·8	20·2	97·0	67·7	29·3	81·4	85·9	79·1	+0·8	68·5	71·7	73·1	71·1
Ratnagiri	29·755	29·687	·068	29·718	+·041	·757	84·4	74·8	9·6	86·4	73·6	12·8	81·7	81·4	78·9	0	72·4	77·3	77·0	75·6
Karwar	·866	·799	·067	·830	+·050	·806	83·1	74·7	8·4	84·4	71·8	12·6	80·3	81·0	78·5	+0·8	73·0	76·2	76·3	75·2
Belgaum	27·336	27·263	·073	27·299	+·026	·759	75·2	66·3	8·9	79·9	64·9	15·0	72·0	72·0	69·4	−0·3	65·7	69·1	69·0	67·9
Secunderabad	28·004	27·893	·111	27·956	+·009	·671	88·2	71·7	16·5	95·7	69·4	26·3	80·6	84·6	78·5	+1·0	69·0	73·3	74·7	72·3
Vizagapatam	29·679	29·567	·112	29·628	−·005	·597	88·0	81·1	6·9	92·0	79·0	13·0	86·0	87·3	85·6	+0·2	73·5	77·5	78·2	76·4
Bellary	28·369	28·254	·115	28·319	+·021	·725	91·4	73·8	17·6	95·4	70·3	25·1	83·5	87·5	81·1	0	68·5	72·6	73·4	71·5
Madras*	29·723	29·758	·137	29·763	+·017	·715	97·5	79·1	18·4	103·7	74·4	29·3	94·0	83·7	85·5	+1·3	?	78·1	77·4	76·8
Salem	28·959	28·811	·148	28·899	+·004	·766	97·0	74·1	22·9	99·9	72·0	27·9	86·4	93·0	83·4	+3·8	70·9	74·2	75·8	73·6
Mercara	26·229	26·153	·076	26·191	+·019	·860	69·4	62·6	6·8	73·1	61·3	11·8	65·8	66·5	64·9	−0·4	61·5	64·4	65·1	63·6
Trichinopoly	29·611	29·468	·143	29·553	+·010	·736	98·2	77·5	20·7	100·9	71·9	29·0	89·9	95·4	85·9	+2·1	72·7	74·5	76·2	74·5
Cochin	·953	·874	·079	·911	+·036	·849	85·0	75·1	9·9	87·2	72·2	15·0	81·6	81·8	79·3	+0·6	73·9	77·0	77·0	76·0
Wellington	24·250	24·181	·069	24·216	+·042	?	72·4	56·6	15·8	76·0	51·8	24·2	67·3	66·5	63·5	+0·8	52·7	59·5	59·1	57·1
Akyab	29·728	29·634	·094	29·685	−·022	·649	85·0	79·3	5·7	88·1	76·5	11·6	81·2	82·4	81·1	+0·8	73·9	78·9	79·2	77·4
Diamond Island	·782	·699	·083	·737	−·011	·713	84·3	71·6	12·8	87·1	69·2	17·9	81·3	80·5	76·6	−1·9	71·7	77·7	76·9	75·5
Rangoon	·783	·688	·095	·742	−·014	·688	91·1	75·3	15·8	105·0	73·3	31·7	80·0	80·0	79·8	+1·4	73·8	78·1	77·6	76·5
Mergui	·802	·716	·086	·755	+·006	·783	83·0	68·7	14·3	87·1	67·2	19·9	79·8	78·5	74·7	−2·7	67·2	76·7	75·8	73·2
Cocos Island	·724	·650	·074	·684	?	·727	84·3	?	?	88·2	?	?	81·3	81·7	?	?	74·4	78·3	78·5	77·1
Port Blair	·804	·724	·080	·760	+·012	·752	84·2	76·9	7·3	88·4	73·6	14·8	82·0	82·1	79·6	−0·3	74·1	78·4	78·2	76·9
Quetta	24·513	24·437	·076	24·473	+·038	?	91·3	62·0	29·3	97·2	52·0	45·2	82·9	89·2	76·2	+0·7	56·4	62·4	61·5	60·2
Leh	19·671	19·554	·117	19·623	−·003	?	77·3	50·3	27·0	83·9	45·2	38·7	65·4	73·6	62·6	+1·8	44·3	52·9	55·2	50·8
Katmandu	25·504	25·.27	·077	25·469	+·022	?	90·6	66·7	23·5	98·6	64·3	34·3	76·7	79·7	75·9	+0·3	66·1	71·4	72·4	70·0
Minicoy	29·974	29·898	·076	29·932	?	·867	83·7	78·8	4·8	86·1	74·9	11·2	81·8	82·0	80·9	?	74·7	77·2	77·2	76·3
Aden	·697	·551	·145	·624	+·035	·649	90·9	78·5	12·4	96·3	72·9	23·4	86·1	89·3	84·3	−1·1	73·3	77·7	77·9	76·3
Perim	·589	·482	·10	·536	?	?	95·8	86·3	9·5	99·7	82·4	17·3	91·7	93·2	90·5	?	68·0	82·6	83·4	78·0
Zanzibar	30·148	30·041		30·094	?	30·094	79·7	72·1	7·7	82·7	70·5	12·2	75·5	78·8	75·7	?	68·7	71·2	70·8	70·2

* The hours of observations are 14 hours and 20 hours (in case of winds 12 hours and 24 hours)

II—*concluded.*

in India, Burma, &c., in August 1891—concluded.

Vapour tension.					Humidity.					Cloud.				Wind Direction.											Wind Steadiness.		Wind Velocity.		Station.
														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.	
·888	·947	·945	·927	−·007	97	84	83	88	+ 2	8·8	9·2	9·0	+1·2	...	1	1	3	8	12	18	14	5	S. 40° W.	S. 45° W.	52	53	246	239	False Point.
·859	·877	·890	·875	−·034	91	76	74	80	− 1	8·4	8·7	8·5	+1·2	5	3	6	6	...	4	22	14	2	S. 62° W.	S. 44° W.	37	45	78	62	Cuttack.
·826	·910	·920	·885	−·020	90	86	82	86	+ 2	8·6	8·4	8·5	+1·6	2	1	3	2	2	3	23	22	4	S. 68° W.	S. 54° W.	61	42	79	79	Sambalpur.
·783	·842	·845	·824	−·003	92	82	77	84	+ 2	9·4	9·2	9·3	+1·4	6	1	1	1	...	1	21	29	2	S. 74° W.	S. 76° W.	73	64	273	186	Raipur.
·725	·767	·743	·745	−·020	87	80	70	79	+ 1	9·1	8·5	8·8	+1·4	...	...	...	...	...	...	1	57	4	N. 88° W.	N. 80° W.	97	80	253	191	Khandwa.
·795	·857	·889	·847	+·027	99	90	84	91	+ 7	9·3	8·8	9·0	+1·4	...	1	...	1	...	7	21	26	6	S. 69° W.	S. 79° W.	76	73	155	84	Hoshangabad.
·762	·825	·835	·807	+·022	95	86	82	88	+ 5	8·0	8·2	8·1	+2·0	...	5	3	1	1	...	14	27	11	N. 84° W.	S. 78° W.	66	66	131	104	Saugor.
·778	·834	·838	·817	+·009	95	86	81	87	+ 5	9·2	8·9	9·0	+0·7	2	3	1	1	...	3	5	37	10	N. 85° W.	N. 84° W.	74	64	86	108	Jubbulpore.
?	·662	·685	?	?	?	92	88	?	?	9·9	9·5	9·7	+1·2	...	2	...	...	1	...	29	20	5	S. 72° W.	N. 80° W.	82	72	310	179	Pachmarhi.
·702	·787	·814	·768	+·029	92	87	88	89	+ 8	7·6	7·8	7·7	+3·2	1	5	...	...	1	...	17	22	16	N. 85° W.	N. 86° W.	72	50	65	114	Seoni.
·707	·803	·808	·773	−·023	83	78	73	78	0	8·9	9·2	9·0	+0·5	...	1	...	...	1	...	9	38	13	N. 87° W.	N. 76° W.	85	62	218	144	Nagpur.
·772	·769	·783	·775	−·032	93	72	70	78	0	8·2	8·8	8·5	+0·3	3	...	...	...	...	...	40	17	2	S. 60° W.	N. 80 W.	87	62	121	134	Chanda.
·811	·870	·892	·858	+·010	91	82	79	84	+ 2	8·6	8·5	8·5	+1·1	17	3	1	1	1	2	9	18	10	N. 87° W.	S. 85° W.	47	63	98	86	Sironcha.
·604	·643	·663	·638	−·006	99	97	93	97	+ 4	9·8	9·2	9·5	+0·6	2	9	...	...	...	...	...	14	37	N. 49° W.	N. 38° W.	85	72	325	253	Chikalda.
·637	·687	·699	·671	−·033	89	77	74	79	− 2	9·1	8·1	8·6	+0·9	...	2	...	...	...	...	...	20	40	N. 58° W.	N. 65° W.	92	72	218	203	Buldana.
·728	·770	·761	·750	+·002	91	76	67	76	+ 1	9·3	9·5	9·4	+1·2	...	1	...	...	...	..	1	12	48	N. 54° W.	N. 71° W.	93	80	250	191	Akola.
?	?	?	?	?	?	?	?	?	?	10·0	10·0	10·0	+0·6	...	4	1	...	...	...	13	9	35	N. 64° W.	S. 82° W.	76	60	?	?	Makhla.
·798	·799	·754	·784	−·015	90	70	56	71	− 4	7·7	7·6	7·7	−0·3	...	16	2	...	...	...	...	7	36	N. 36° W.	S. 47° W.	87	72	321	288	Deesa.
·831	·891	·881	·868	−·014	88	83	81	84	− 3	8·9	9·1	9·0	+0·2	...	...	...	...	1	...	14	44	3	S. 81° W.	S. 81° W.	90	81	385	384	Bombay.
·659	·698	·690	·694	+·011	91	77	74	81	+ 5	8·9	8·9	8·9	+0·2	...	...	...	...	...	...	8	48	6	S. 89° W.	S. 84° W.	92	82	343	343	Poona.
·669	·656	·656	·662	+·007	89	61	55	67	− 1	8·0	9·0	8·5	+0·3	...	1	...	...	...	...	22	34	5	S. 78° W.	N. 89° W.	88	79	387	273	Sholapur.
·766	·879	·871	·842	−·008	89	82	82	85	0	5·8	5·8	5·8	−1·2	1	1	1	...	...	3	18	36	2	S. 76° W.	S. 63° W.	82	61	282	246	Ratnagiri.
·793	·851	·847	·832	−·001	92	82	80	85	− 3	6·2	6·7	6·4	−0·8	7	3	...	...	...	...	29	9	14	S. 79° W.	W.	64	79	80	?	Karwar.
·625	·678	·675	·667	+·010	96	86	86	89	+ 1	8·7	8·5	8·6	0	...	...	...	...	...	5	38	17	...	S. 54° W.	S. 79° W.	87	89	599	497	Belgaum.
·677	·730	·746	·716	+·033	88	70	63	74	+ 1	6·8	6·7	6·8	+0·4	...	1	...	...	...	...	3	33	25	N. 73° W.	S. 87° W.	89	83	316	246	Secunderabad.
·723	·834	·851	·803	−·070	68	67	66	67	− 5	8·1	8·4	8·3	+1·8	...	1	1	1	...	3	20	35	1	S. 73° W.	S. 74° W.	81	64	95	70	Vizagapatam.*
·632	·665	·641	·646	−·015	76	58	49	61	− 3	7·8	8·5	8·2	+0·6	2	...	...	...	...	...	1	45	14	N. 80° W.	N. 86° W.	90	87	326	261	Bellary.
?	·747	·857	·810	+·006	?	48	75	66	− 5	7·0	6·8	6·7	+0·2	...	...	...	1	8	11	23	15	4	S. 42 W.	S. 40° W.	66	58	200	174	Madras.*
·714	·684	·663	·687	−·067	85	54	44	61	−13	4·3	6·7	5·5	−0·5	...	1	...	...	...	19	30	9	3	S. 41° W.	S. 60° W.	79	80	92	96	Salem.
·534	·593	·604	·579	−·006	93	92	93	93	− 2	8·6	9·2	8·9	−0·6	...	...	...	...	...	...	...	53	9	N. 84° W.	N. 73° W.	97	88	144	210	Mercara.
·740	·645	·648	·678	−·039	79	46	40	55	− 6	5·6	6·2	5·9	−1·7	...	..	...	...	...	...	5	36	21	N. 78° W.	N. 81° W.	90	83	263	198	Trichinopoly.
·823	·869	·866	·853	+·020	94	81	80	85	− 2	4·0	6·1	5·2	−1·2	1	1	3	1	...	...	1	15	40	N. 53° W.	N. 85° W.	82	59	119	?	Cochin.
·361	·430	·426	·406	−·033	79	64	66	70	− 7	6·3	7·9	7·1	−0·4	...	1	...	...	1	2	33	18	7	S. 66° W.	S. 81° W.	81	46	108	89	Wellington.
·770	·962	·958	·897	−·010	77	90	86	84	− 4	8·8	8·0	8·4	+0·3	...	1	1	8	15	28	5	4	...	S. 16° E.	S. 1° E.	68	62	108	82	Akyab.
·775	·905	·881	·853	−·025	99	84	84	89	+ 1	8·6	9·0	8·8	+1·2	2	1	...	...	...	11	36	12	...	S. 47° W.	S. 44° W.	82	78	174	167	Diamond Island.
·816	·938	·919	·891	0	93	92	90	92	+ 2	8·4	8·7	8·6	−0·3	...	...	...	...	...	14	31	14	3	S. 48° W.	S. 36° W.	82	68	117	115	Rangoon.
·647	·881	·859	·796	−·050	92	87	88	89	0	9·5	9·6	9·6	+0·9	...	3	...	...	2	...	21	15	21	N. 88° W.	S. 63° W.	69	63	53	39	Mergui.
?	·934	·933	?	?	?	87	86	?	?	8·8	8·8	8·8	?	...	...	...	...	...	6	45	1	...	S. 41 W.	?	96	?	?	?	Cocos Island.
·805	·927	·916	·833	−·012	87	85	84	85	− 1	8·9	8·9	8·9	+1·9	2	...	...	...	...	1	37	22	...	S. 61° W.	S. 43° W.	89	82	343	229	Port Blair.
·406	·353	·260	·343	−·060	71	31	18	40	− 7	1·5	3·4	2·4	+1·0	54	...	...	...	...	...	2	4	2	W.	N. 78° W.	10	42	24	101	Quetta.
·242	·289	·278	·270	+·009	66	47	34	49	+ 1	6·4	5·7	6·1	+1·0	5	3	2	1	3	5	19	19	5	S. 68° W.	S. 72° W.	55	31	29	40	Leh.
·637	·710	·714	·685	+·011	93	77	71	79	− 1	6·6	7·7	7·1	+0·4	4	3	3	25	1	1	2	18	5	N. 41° E.	S. 75° W.	11	35	21	?	Katmando.
·803	·873	·873	·850	?	81	80	80	81	?	5·5	6·5	6·0	?	...	...	...	...	...	..	25	36	1	S. 73° W.	?	92	?	447	?	Minicoy.
·754	·838	·807	·800	−·001	78	67	59	68	+ 2	2·3	1·6	1·9	+0·2	9	...	...	6	9	30	6	2	...	S. 9° E.	S. 12 E.	66	9	224	268	Aden.
·437	·997	1·019	·822	?	35	68	66	56	?	2·5	1·0	1·7	?	...	9	3	4	3	1	4	25	13	N. 63° W.	?	52	?	374	?	Perim.
·658	·709	·648	·668	?	83	80	67	76	?	5·1	4·2	4·4	?	...	3	2	2	9	23	8	2	2	S. 1° E.	S. 6° W.	56	5	?	143	Zanzibar.

and the means are as given in the registers sent by Government Astronomer, Madras.

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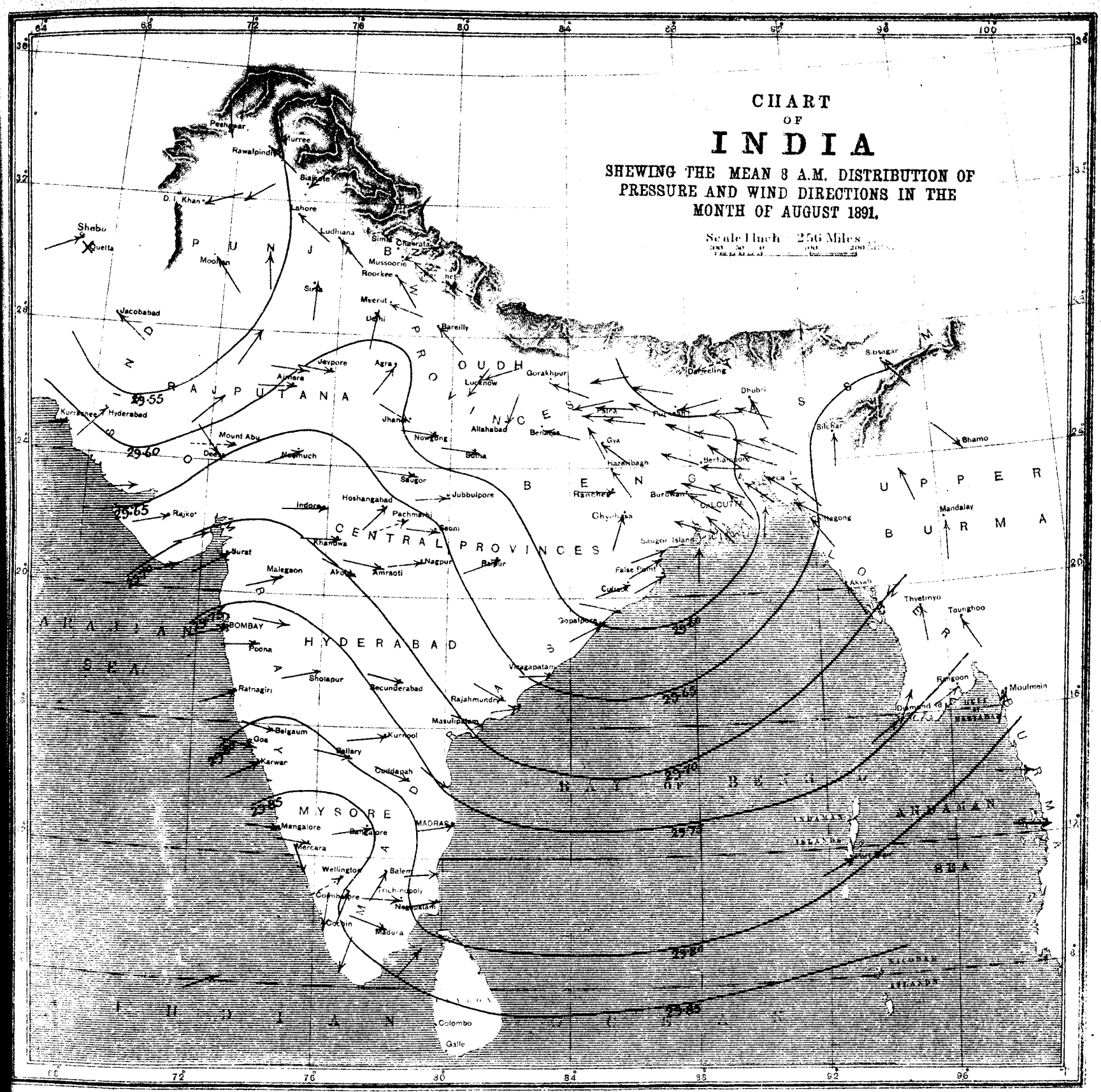
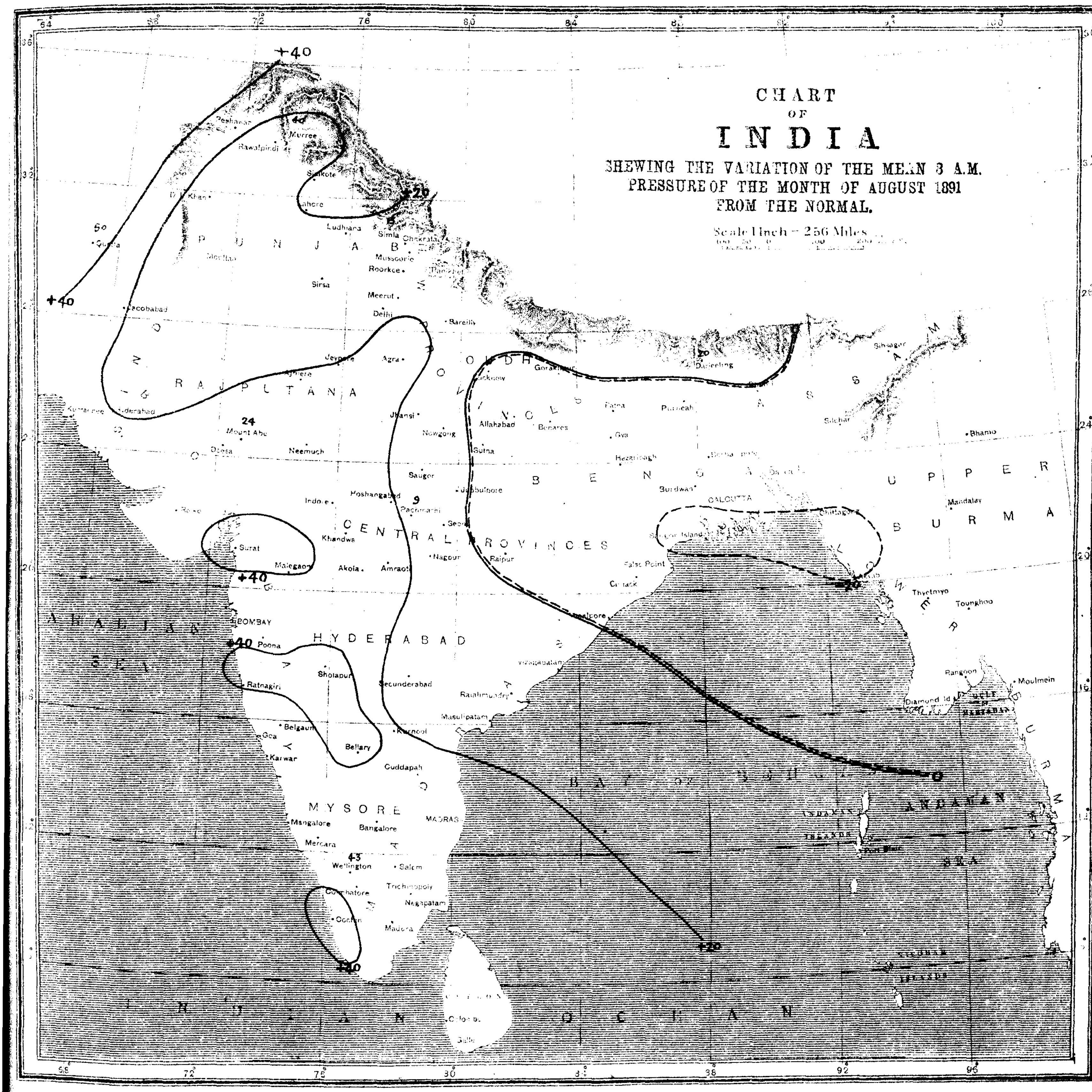


Explanation.

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.



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.

Reg. No. 752 (w), Wr., I.—Feb. 92.—415.

Photo-litho. S. I. O., Calcutta.

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

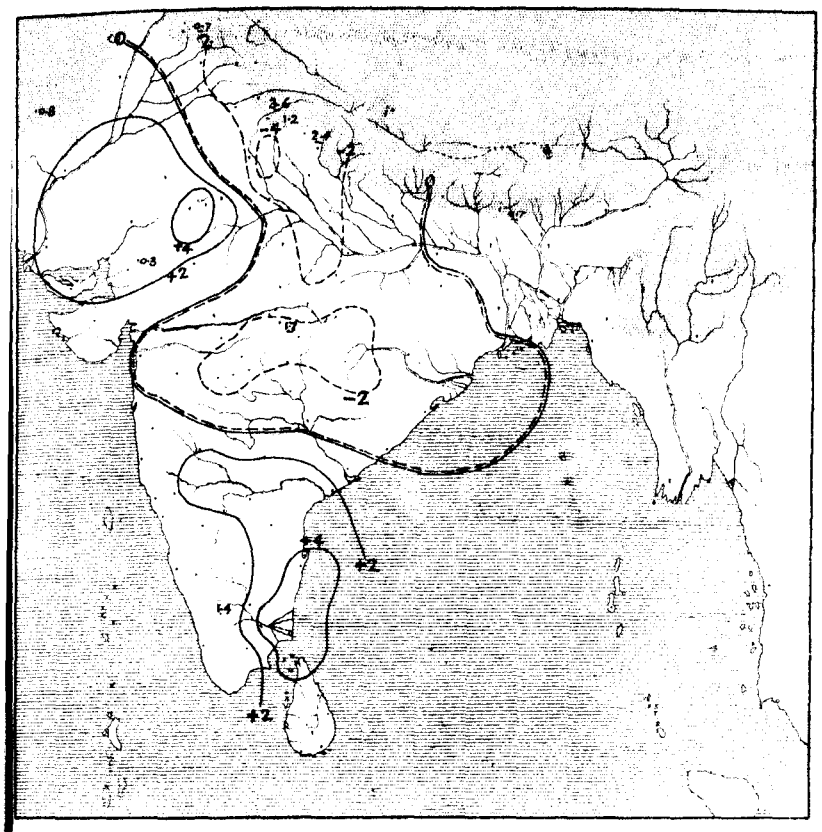
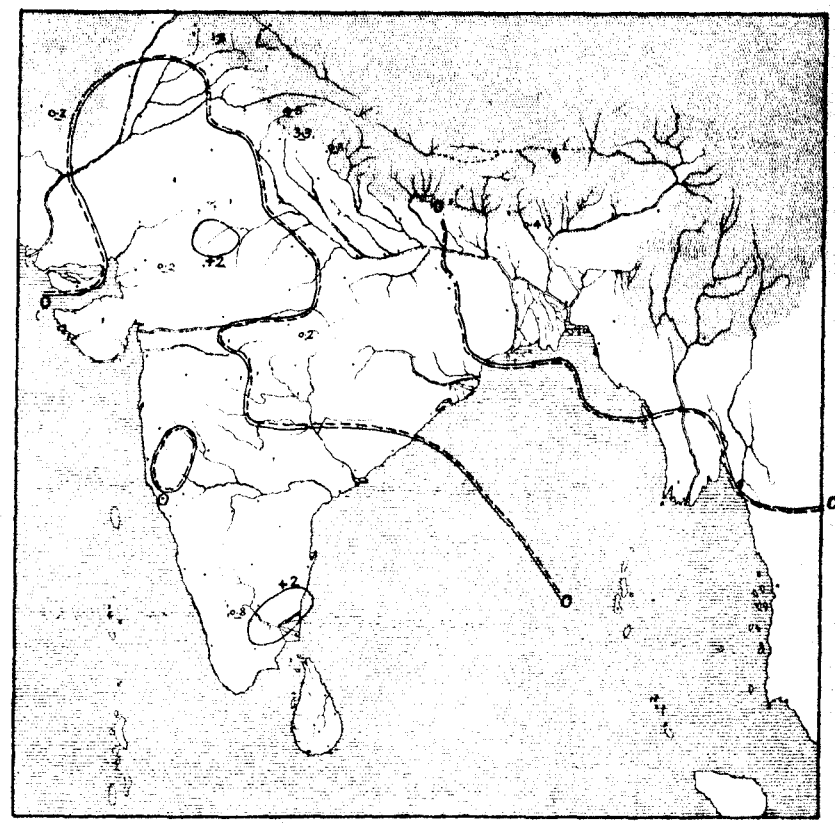


CHART SHEWING THE VARIATION OF THE MEAN MINIMUM TEMPERATURE OF THE MONTH FROM THE NORMAL.



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.

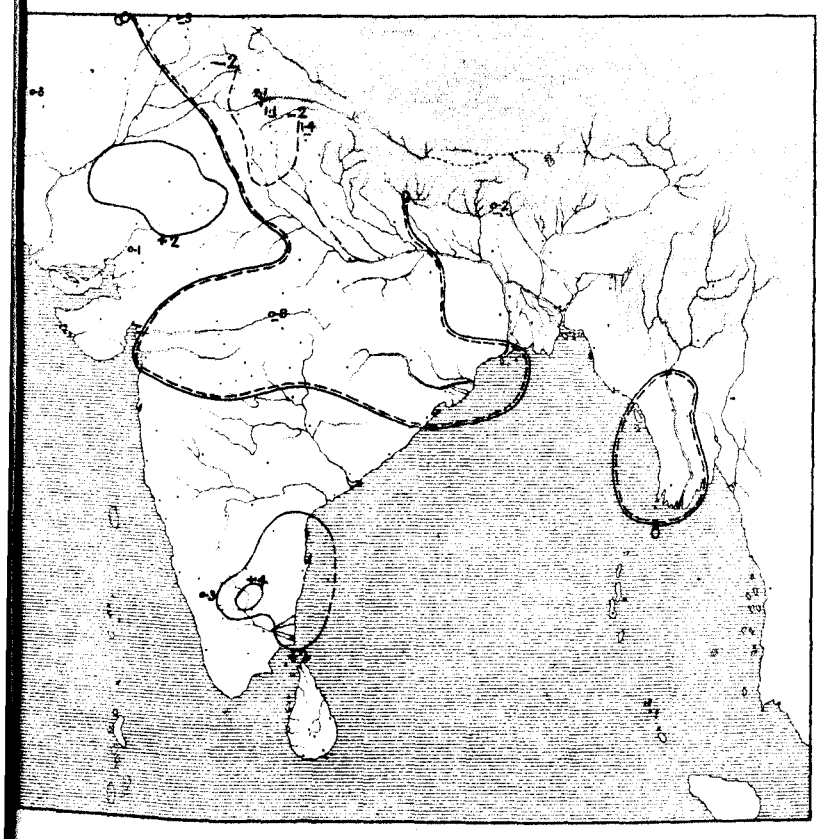
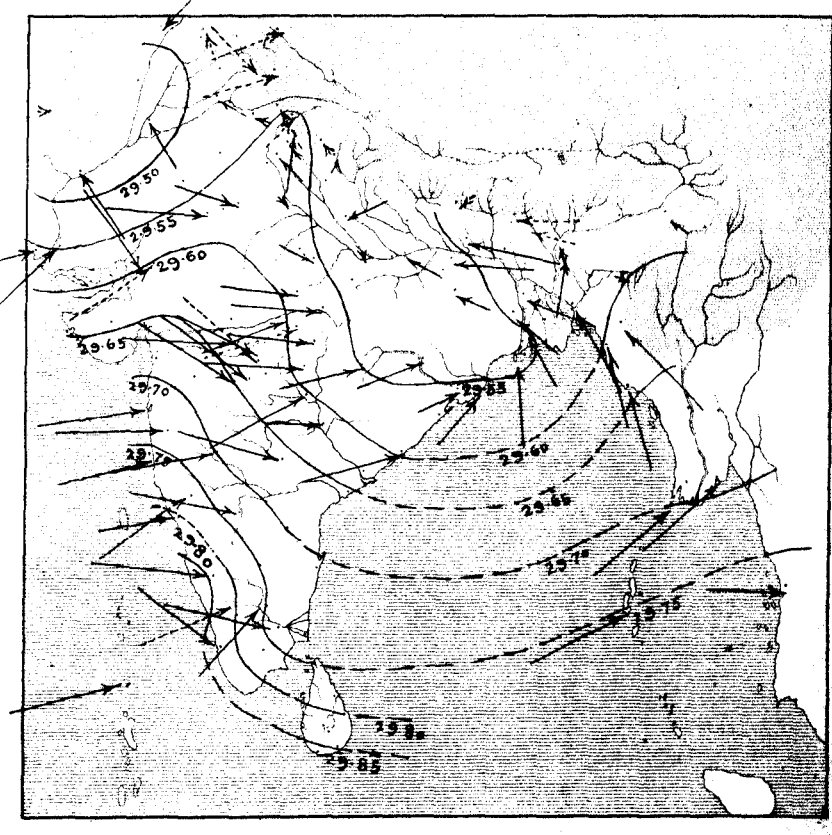


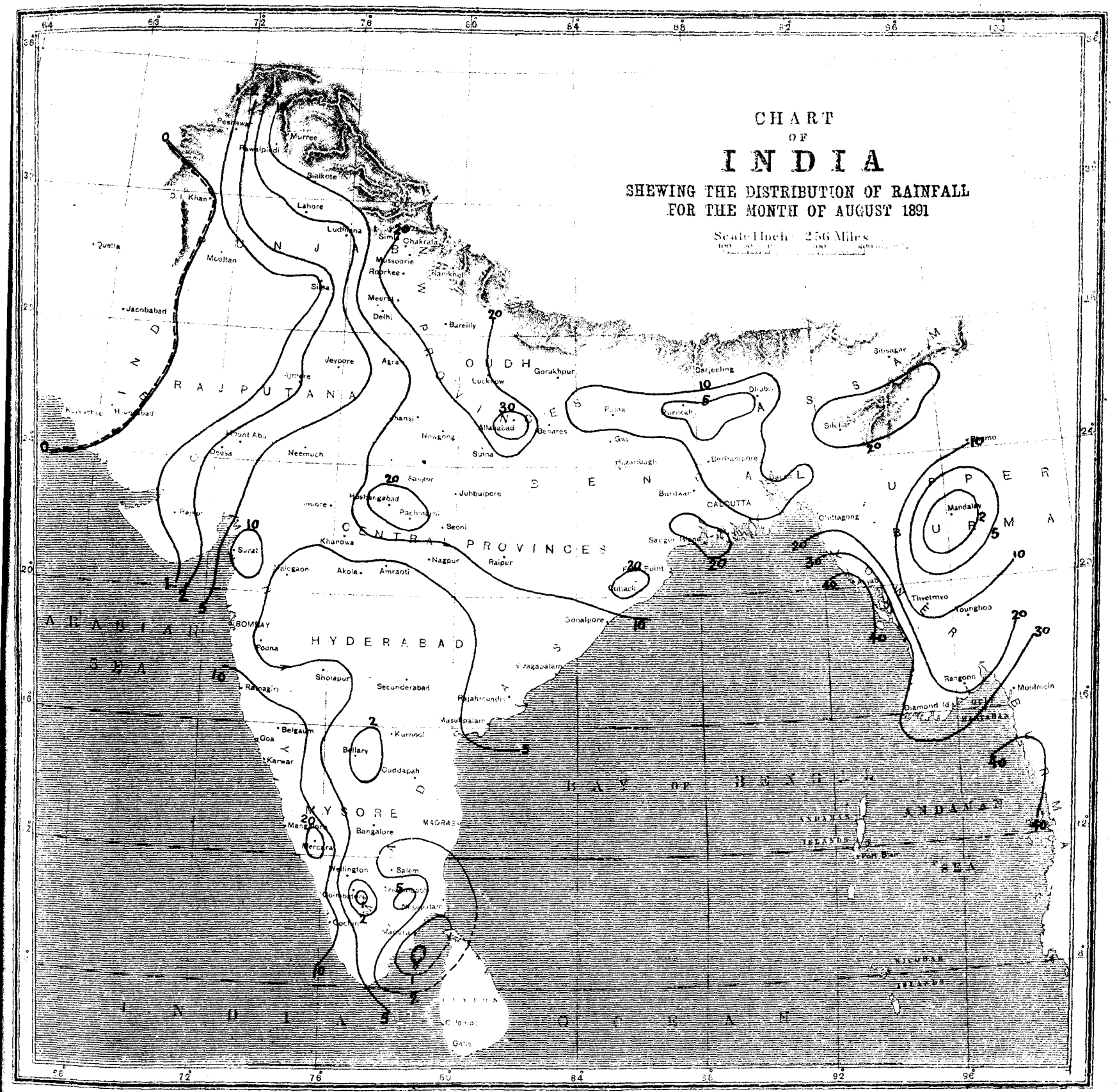
CHART SHEWING THE MEAN DISTRIBUTION OF PRESSURE AND THE RESULTANT WIND-DIRECTIONS IN THE MONTH OF AUGUST 1891.



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 $\frac{5}{8}$th of an inch being equal to 100 per cent.

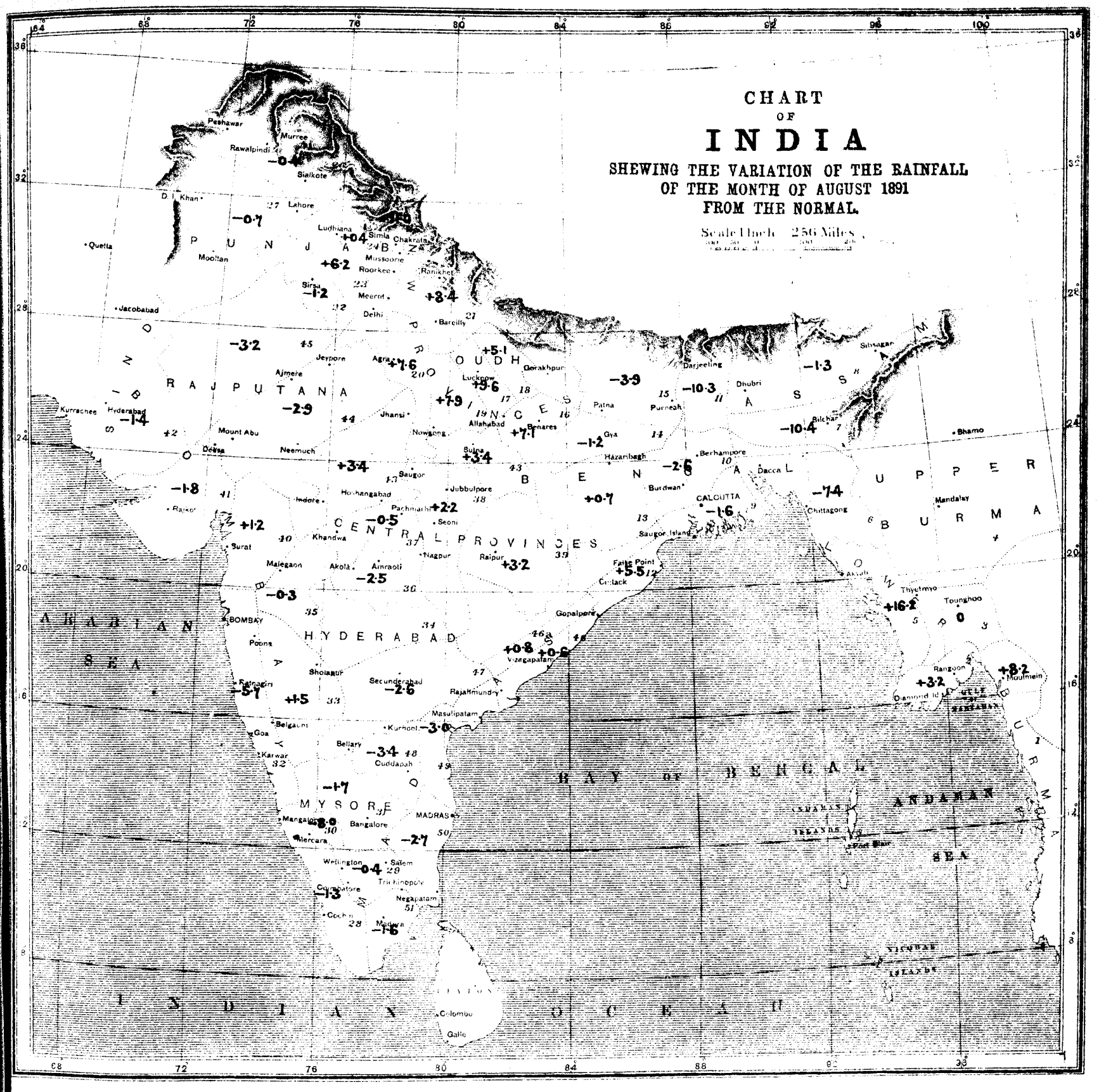


Explanation.

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. 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.

98. No. 792 (a). Wr., I.—Feb. 92.—415.

Photo-litho., 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 51 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 name of the districts 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
3. Central do.
4. Upper do.
5. Arakan
6. Eastern Bengal
7. Assam (Surma)
8. Do. (Brahmaputra)
9. Deltaic Bengal
10. Central do.
11. North do.
12. Orissa
13. Chota Nagpore
14. Behar (South)
15. Do. (North)
16. North Western Provinces (East)
17. Oudh (South)
18. Do. (North)
19. North Western Provinces (Central)
20. Do. do (West)
21. Do. do (Submontane)
22. Punjab (South)
23. Do. (Central)
24. Do. (Submontane)
25. Do. (Hill Districts)
26. Do. (North West)
27. Punjab (West)
28. Malabar
29. Madras (South Central)
30. Coorg
31. Mysore
32. Konkan
33. Bombay Deccan
34. Hyderabad (North)
35. Khandeish
36. Berar
37. Central Provinces (West)
38. Do. (Central)
39. Do. (East)
40. Guzerat
41. Kattiawar
42. Sind
43. Central India (East)
44. Rajputana (East) Central India (West)
45. Rajputana (West))
46. East Coast (North)
46(a.) Do. do. (a)
47. Hyderabad (South)
48. Madras (Central)
49. East Coast (Central)
50. East Coast (South)
51. Madras (South)

GOVERNMENT OF INDIA.

METEOROLOGICAL DEPARTMENT.

MONTHLY WEATHER REVIEW.

PUBLISHED BY ORDER OF

THE GOVERNMENT OF INDIA.

CALCUTTA, SEPTEMBER, 1891.

INTRODUCTION.

THIS review of the weather in India during the month of September 1891 is based on observations taken daily at 8 A.M. at 160 stations, and on additional observations taken at 10 A.M. and 4 P.M. at 89 stations. The rainfall summary for September is based on the rainfall data of the meteorological observatories and the weekly rainfall telegrams sent to Simla by District Officers throughout India and the monthly rainfall statements published in the provincial gazettes. The meteorological data of ths Bay of Bengal and the Arabian Sea, which are collected at the ports of Calcutta and Bombay, are utilized, so far as is at present possible, in discussing the weather of India.

Summary of the chief features of the weather in India during the month of September 1891.

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 appearance of more or less severe cyclonic storms over the Bay of Bengal. The date of the occurrence of the former phenomenon 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 frequently of considerable severity, and give heavy and general rainfall. Their course is, as a rule, west-north-west from the Orissa coast across 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 west to north.

The chief feature of the meteorology of the month of September 1891 was a succession of five depressions, or south-west monsoon storms, which passed into India from the Bay, and gave more or less heavy cyclonic rainfall to the areas over which they passed. They also increased for short periods the intensity of the moist winds blowing across the Bengal and Bombay coasts into the interior.

At the commencement of the month temperature was excessive in two areas, *viz.*, South and Central Madras and Sind and Rajputana, which had received little or no rain during the previous months of July and August.

The first depression and storm of the month formed in the north-west angle of the Bay on the 1st and 2nd. It crossed the Balasore coast during the night of the 2nd, passed through Chutia Nagpur on the 3rd and advanced into the North-Western Provinces on the 4th, where it filled up during the next 24 hours. This storm gave a general moderate burst of rain to the whole of Bengal, Behar, Chutia Nagpur and the North-Western Provinces.

The second depression formed in the north-west angle of the Bay on the 4th, whilst the preceding one was breaking up. It intensified on the 5th, and crossed the Balasore

6

Coast on the early morning of the 6th, and advanced through Chutia Nagpur and the eastern districts of the Central Provinces on the 7th. It passed into Bundelkhand on the 8th, and thence drifted very slowly westwards to the neighbourhood of Jeypur on the morning of the 10th. This storm gave an excessively heavy burst of rain to Orissa, Chutia Nagpur, and the eastern districts of the Central Provinces, Central India and Rajputana. The rainfall extended on the 9th and 10th over the greater part of Rajputana and caused a considerable reduction of temperature in that hot area. The rainfall accompanying this storm was much more concentrated than that of the previous storm, and fell chiefly in the storm area itself.

The third depression formed on the 10th and 11th in the north-west of the Bay, and crossed the Orissa coast on the early morning of the 12th. It advanced through the eastern districts of the Central Provinces on the 13th and Baghelkhand on the 14th, and thence passed into the south-eastern districts of the North-Western Provinces on the 15th, and into Oudh on the 16th, where it filled up during the day. It was an extensive shallow depression throughout, and the rainfall accompanying it was diffused. Hence Bengal, Chutia Nagpur, Behar, the Central Provinces, Central India and the North-Western Provinces received a general moderate burst of rain during its existence.

The fourth depression was a very feeble disturbance. It originated off the coast of Ganjam and Orissa on the 17th and hence further south than the previous storm. It crossed the Ganjam coast on the 18th, and passed rapidly westwards into the western districts of the Central Provinces on the 19th, where it filled up during the next 24 hours. It gave moderate rain to the Central Provinces, Berar and the North Deccan.

The fifth, and last, depression originated outside the Indian area, probably in the China Sea. It crossed the Gulf of Siam and Tenasserim on the 19th, and passed out into the north of the Andaman sea on the morning of the 20th. It then advanced rather rapidly in a general W.N.W. direction across the Bay of Bengal, and was throughout this period a shallow depression, in which weather was squally with light to moderate winds and heavy rain. It crossed the Orissa coast to the south of False Point on the night of the 22nd, and advanced almost due west into the western districts of the Central Provinces on the 24th. It moved very slightly during the next 48 hours, but intensified considerably, and then began to move slowly to the north, and the centre passed near to Pachmarhi on the 27th, Jubbulpore on the 28th and Sutna on the 29th. It thence advanced into the eastern districts of the North-Western Provinces and Oudh on the 30th, and filled up in West Behar and the eastern districts of the North-Western Provinces on the 3rd and 4th of October. It resembled the second storm, in that it gave very heavy cyclonic rain to the districts through which it passed. The rainfall was exceptionally heavy in Berar and the western districts of the Central Provinces, where the storm flooded the rivers and caused some damage to property.

The temperature conditions of September are almost solely dependent upon the distribution of rainfall. As has already been stated, in consequence of the occurrence of a large number of cyclonic storms, all of which passed through the Central Provinces into the North-Western Provinces, the rainfall of the month was more or less excessive in Orissa, Chutia Nagpur, the Central Provinces, Berar, Central India (East) and the North-Western Provinces. It was in defect over the remainder of India. The deficiency was large in three areas: 1st, North Bengal; 2nd, South and Central Madras; 3rd, Rajputana Kattiawar and Sind. The two latter areas had been characterized by drought throughout the whole monsoon.

In the areas of excessive rainfall, both the day and night temperatures were reduced below the normal, but the reduction was, as might be expected, greatest in the day temperature. The following gives variation data for the areas of deficient temperature:—

District.	Variation of			Average daily range.	Average absolute range during month.
	Mean maximum temperature from normal.	Mean minimum temperature from normal.	Mean temperature from normal.		
	°	°	°	°	°
Deccan	−2·3	0	−1·2	13·1	21·8
Upper Sub-Himalayas .	−1·6	+1·5	−0·1	15·0	27·0
Burma Coast . . .	−0·6	−0·5	−0·6	9·7	15·3

The deficiency was absolutely greatest at Nagpur (where it was —2·7°), Indore (—2·3°), Hoshangabad (—2·2°) and Raipur (—2·1°).

In the remainder of India, where rainfall was in defect, both the day and night temperatures were raised above the normal, the excess being generally greatest in the day temperature. The following gives (temperature) variation data for these areas:—

District.	Variation of			Average daily range.	Average absolute range during month.
	Mean maximum temperature from normal.	Mean minimum temperature from normal.	Mean temperature from normal.		
	°	°	°	°	°
Assam	+1·8	+0·7	+1·2	12·6	21·3
Bengal and Orissa . .	+0·4	+0·1	+0·3	10·4	17·7
Gangetic plain and Chutia Nagpur . . .	+0·2	+0·4	+0·3	12·4	20·2
Indus valley and North-West Rajputana . .	+2·4	+1·9	+2·2	22·2	34·1
South-East Rajputana, Central India and Guzerat .	−0·5	+1·2	+0·3	14·2	23·5
West coast . . .	+0·8	+0·1	+0·5	11·3	15·3
South India . . .	+2·4	+0·9	+1·7	16·4	25·2

The excess in Southern India was geatest at Salem, where the mean temperature of the month was 4·5° above the normal. In the Rajputana area of drought the excess of temperature was greatest at Ajmere (3·9°) and Deesa (3·9°). As the heaviest rainfall was determined to the same areas throughout the month, the variations of temperature day by day depended upon the variations in the amount and extent of the rainfall. The first eight days of the month formed a very dry period throughout the whole of Upper India, and temperature was excessive at that time in Rajputana, Sind, and the West and Central Punjab. The highest temperatures of the month (slightly exceeding 110°) were recorded at Jacobabad, Mooltan and Montgomery on the 3rd and 11th. Jacobabad registered the highest absolute maximum temperature of the month, *viz.*, 112 2°, on the 4th and 11th. During that period the day temperature was from 8° to 15° above the normal in the area of highest temperature. The extension of rainfall into Central Rajputana on the 9th reduced temperature considerably in Upper India, and temperature during the remainder of the month was in slight to moderate excess in that area.

Similarly, in Southern India the first half of the month was characterised by dry hot weather, and higher maximum temperatures were registered during that period than have been recorded since 1877. The highest maximum temperatures observed in this area were 102·4° at Madras on the 14th and 101·9° at Salem on the 17th. The weather in Southern India during the last ten days of the month was showery, and temperature hence fell considerably.

Temperature was in slight to moderate defect at the hill stations.

The Bay of Bengal current was on the average of the month stronger than usual. Very strong winds prevailed in the Andaman sea during the first ten days of the month; and winds were more directly from the west than usual in that part of the Bay and in Lower Burma. Winds were stronger and steadier in Bengal, and the easterly element was unusually strong, showing that the current was diverted away from East and North Bengal to the Gangetic plain. Hence winds were unusually steady and considerably stronger than usual in Chutia Nagpur, Behar and the North-Wesern Provinces. In Sind and West Rajputana dry north-westerly winds were unusually prevalent.

The Bombay current, estimated by the strength of the winds at the west coast stations, was on the average of the month very slightly below its normal strength. Winds were practically normal in direction in the Deccan, but were considerably stronger than usual.

It will thus be seen that the south-west monsoon currents prevailed during the whole month over the whole of India, except Sind and West Rajputana and the West Punjab.

The air contained a much larger quantity of moisture on the average of the month in the areas of excessive rainfall, more especially the Central Provinces, Central India and the North-Western Provinces. As temperature was below the normal in these areas, the humidity of the month was very considerably in excess by amounts which, in some cases, exceeded 15. The excess was absolutely greatest at Meerut, where the mean humidity of the month was 83, or 21 above the normal, and Agra, where it was 17 above The air was considerably drier than usual in the Rajputana and Southern India drought areas. The variations from the normal hygrometric conditions were small in other districts.

Cloud was largely in excess over the greater part of the interior. The excess was very marked in the North Deccan, the Central Provinces, Berar, Central India and the North-Western Provinces, and the average amount of cloud over the greater part of the area including these provinces and division was even greater than in the coast districts of the Konkan or South Bengal.

The amount of cloud was in moderate deficiency in Assam and North Bengal, Southern India, the West coast, Sind and Rajputana.

The following table gives the mean variations of the aqueous vapour pressure, humidity and amount of cloud in the meteorological provinces of India:—

Division.	Mean Variation of		
	Aqueous vapour pressure from normal.	Humidity from normal.	Cloud amount from normal.
	Inch.	%	
Burma coast and Bay islands	—·029	+ 1	+ 1·0
Assam	+ ·018	— 3	— 0·5
Bengal and Orissa	—·013	— 1	+ 0·7
Gangetic plain and Chutia Nagpur	+ ·035	+ 2	+ 0·7
Upper Sub-Himalayas	+ ·067	+ 10	+ 2·1
East Rajputana, Central India and Guzerat	+ ·077	+ 7	+ 1·9
Indus valley and N.-W. Rajputana	—·012	— 4	+ 0·2
Deccan	+ ·025	+ 6	+ 1·7
West coast	+ ·004	+ 1	—0·4
South India	—·013	— 4	—0·5

The distribution of rainfall has been already indicated in the preceding remarks. It was mainly determined by the five cyclonic storms of the month. These storms, roughly speaking, followed the same general path. They advanced across Orissa, through the Central Provinces and Chutia Nagpur, into the North-Western Provinces. Hence the provinces in or near these tracts received excessive rainfall. The total rainfall of the month was

hence exceptionally large in Orissa, the Central Provinces, Berar, the Eastern Districts of Central India and the North-Western Provinces. The indraught to these storms, on the other hand, largely diminished the rainfall in Assam, North and East Bengal. The greater part of Burma, except the central districts of Upper Burma received larger amounts than usual, as it had done during the previous months of the south-west monsoon of 1891.

The Peninsula received moderate rain from the Bombay coast during the third week of the month, but the rainfall was in defect, except in the districts of Hyderabad bordering on the Central Provinces.

The following table gives average rainfall data for the eleven meteorological provinces of India. The means in the various columns are for different groups of stations, as normal rainfall data are not available for certain meteorological stations established during the past three or four years:—

METEOROLOGICAL PROVINCE.	Average actual rainfall of month.	Average normal rainfall of month.	Variation from normal.
Burma coast	24·37	20·91	+5·32*
Burma, Inland	6·81	9·60	−2·79
Assam	9·41	13·44	−4·03
Bengal and Orissa	8·99	11·34	−2·96*
Gangetic plain and Chutia Nagpur	6·50	7·72	−1·12*
Upper Sub-Himalayas	6·48	5·49	+0·99
Indus valley and North-West Rajputana.	0·56	1·01	−0·45
Rajputana, Central India and Guzerat	8·06	4·95	+3·67*
Deccan	14·60	7·48	+7·12
West coast	10·03	11·21	+0·10*
South India	3·42	5·37	−1·76*

* A reference to Table I will show that the means for the provinces marked * in columns 2 and 3 are for a smaller number of stations than the mean in the first column. Average rainfalls are not at present available for certain stations.

Atmospheric Pressure.

The distribution of mean 8 A.M. pressure for September is shown by means of two charts. The first chart (Plate I) gives the distribution of the mean pressure of the month reduced to sea-level and to constant gravity (that of Latitude 45°) by means of isobars drawn for differences of pressure of ·05″, or $\frac{1}{20}$th of an inch. The second chart (Plate II) gives the variations of the actual mean pressure from the normal pressure. These values are obtained from the barometric readings reduced for temperature only. A small chart (No. 4 of Plate III) gives the distribution of the monthly mean daily pressure and of the mean winds in the same form and manner as in the monthly charts given hitherto in annual reports on the meteorology of India. The data on which this chart is based are given in Table II.

The more important barometric changes and movements during the month are fully given in the statement of the barometric depressions of the month. The data that are chiefly used in this discussion are the 8 A.M. reduced observations, and the variations derived from a comparison of these observations and the normal values. The normal means are obtained from the observations of the period 1878—1888, and, in order that the means and variations may be strictly comparable, the means have been calculated for observations of the same period in all cases.

The mean pressure of the Indian land area during the month of September was ·003″ below the normal, and hence almost identical with the mean. Relatively to the general state, pressure was in local defect in a broad belt stretching from South Behar, Chutia Nagpur and Orissa to Sind and the South-West Punjab. The anomalies were small over the greater part of the area, but were large in the central portion, including the Central Provinces and the adjacent districts of the North-Western Provinces. The following gives the negative pressure anomalies exceeding ·030″:—

DIVISION.	STATION.	Negative anomaly.
North-Western Provinces	Allahabad	−·030″
Central India	Nowgong	−·028″
	Sutsia	−·041″
Central Provinces	Jubbulpore	−·040″
	Saugor	−·041″
	Nagpur	−·036″
	Sambalpur	−·027″

Pressure was locally in excess over the remainder of India and in Burma. The excess was small, except in the Deccan and Mysore and the Konkan, and exceeded ·020″ at the following stations:—

STATION.	Positive pressure anomaly.
Bellary	+·032″
Bangalore	+·027″
Madras	+·023″
Ratnagiri	+·026″
Sholapur	+·023″

The varations of the mean pressure from the normal at the hill stations differed little from those at the neighbouring plain stations, except at Murree, Leh and Quetta, where there was a moderate excess. The following shows the amount of excess at these stations:—

HILL STATION.	Variation of mean pressure from normal, September 1891.	NEIGHBOURING PLAIN STATION.	Variation of mean pressure from normal, September 1891.
	Inch.		Inch.
Leh	+·024	Lahore	+·010
Murree	+·039	Peshawar	+·013
Simla	+·010	Ludhiana	−·009
Chakrata	−·024?	Roorkee	+·017
Ranikhet	+·011	Bareilly	+·004
Quetta	+·040	Jacobabad	−·005

Depressions and cyclonic storms of the month.

Depression of the 1st to the 5th.—At the commencement of the month pressure was considerably below the normal by amounts ranging from ·03″ at Peshawar and Colombo to ·15″ on the coast of Ganjam and the Circars. A shallow depression lay off that coast, but weather was fine with moderate to strong monsoon winds in the north and centre of the Bay. The weather became squally in the north of the Bay during the next 24 hours. Winds were light and variable at the Head of the Bay on the morning of the 2nd, but strengthened during the day. The shallow depression was transferred to Chutia Nagpur on the morning of the 3rd. A general increase of pressure had, however, occurred over the whole of India during the previous 48 hours, and the depression at the centre on the 3rd was not greater than ·05.″

The central depression on the morning of the 4th was in the southern and eastern districts of the North-Western Provinces, but was ill-defined. The following observations indicate its character and position at 8 A.M. of that day:—

Station.	Pressure.			Wind.	
	Reduced to 32° sea-level and constant gravity.	Change during past 24 hours.	Variation from normal.	Direction.	Velocity in miles per hour.
	Inches.	″	″		
Allahabad . .	29·587	−·059	−·064	W S W	5
Gorakhpore . .	·612	−·064	−·046	E S E	4
Lucknow . .	·552	−·099	−·110	N	5
Cawnpore . .	·573	−·074	?	N	5

The circulation in the central area was hence feeble, but the indraught to it from the Bay was strong, and hence the storm gave moderately heavy rain at this time to the whole of Bengal and part of the Gangetic plain.

The depression began to fill up on the evening of the 4th. Moderate rain fell during that day in the North-Western Provinces, but rain ceased on the 5th for a brief period in Behar and the greater part of Chutia Nagpur in consequence of the formation of another depression at the Head of the Bay. Winds were light and irregular on the 5th in the North-Western Provinces, and the depression disappeared entirely during the course of the day.

This depression was hence shallow and feeble throughout, and was only important in that it determined a brief general fall of rain over Bengal and the North-Western Provinces on the 3rd and 4th.

Depression of the 5th to the 10th.—A well marked depression, the centre of which was in about Lat. 21° N. and Long. 89° E., covered the north-west angle of the Bay on the morning of the 5th. The S. S. *Regal*, approaching the mouth of the Hooghly, had light variable winds and constant heavy rain during the morning. The ship *Hugh Cann*, in Lat. 20° 10′ N. and Long. 87° 30′ E., at noon had heavy rain, and the ship *Middlesex*, in Lat. 21° N. and Long. 88° E at noon of the 4th, had variable winds and thick heavy rain. The S. S. *Arabia* and *Sirdhana* in the River Hooghly reported light variable winds. Further south strong south-west monsoon winds were blowing. The S. S. *Megna*, in Lat. 18° 26′ N. and Long. 86° 52″ E. at noon of the 5th and proceeding southwards, had a strong gale with hard squalls and heavy rain during the greater part of the day. The data hence established that winds were light and that heavy rain was falling in the shallow depression which was forming at this time at the head of the Bay. The logs of ships also establish that strong south-west monsoon winds (force 4 to 8) obtained at this time on the centre and north of the Bay.

The centre began to move westward on the afternoon of the 5th and crossed the North Orissa coast early on the morning of the 6th. The following 8 A.M. observations indicate that it was crossing the Orissa hills at that hour:—

Station.	Pressure.			Wind.		Percentage ratio of actual to normal.
	Reduced to 32° sea-level and constant gravity.	Change during past 24 hours.	Variation from normal.	Direction.	Velocity in miles per hour.	
	Inches.	″	″			
Cuttack . .	29·496	−·123	−·170	SW	3	125
False Point .	·508	−·119	−·169	WSW	8	100
Balasore . .	·485	−·090	?	ESE	6	...
Sambalpur .	·496	−·082	?	NW	4	160

The centre of the depression was probably in Lat. 21½° N and Long 85½° E. at 8 A.M.

The cyclonic circulation was very clearly defined but was feeble, and the winds at False Point, Cuttack and Saugor Island were very slightly above their normal strength. The trough of low pressure at this time ran from Orissa to the central districts of the North-Western Provinces, and thence to Upper Sind. The storm advanced rather rapidly along this trough during the day, and was in Chutia Nagpur and the eastern districts of the Central Provinces on the morning of the 7th. The position of the centre at 8 A.M. is indicated by the following observations:—

Station.	Pressure, 8 A.M.			Wind, 8 A.M.	
	Reduced to 32° sea-level and constant gravity.	Change during past 24 hours.	Variation from normal.	Direction.	Velocity in miles per hour.
	Inches.	″	″		
Raipur . .	29·562	−·026	−·118	WSW	16
Chyebassa .	·560	+·080	?	SSE	2
Hazaribagh .	·594	+·035	−·088	ESE	16
Benares . .	·557	−·017	−·100	ENE	7
Sutna . .	·544	−·052	−·127	N	8
Jubbulpore .	·580	−·032	−·110	W	4

The centre was probably in Lat. 24° N. and Long. 82½°E. Moderate to fresh south-west winds with occasional squalls obtained on the 7th at the head of the Bay.

The depression advanced more slowly than hitherto, and its course during the next 24 hours was almost due west with a slight northing. The centre was in Lat. 24½° N. and Long. 79¾° E. at 8 A.M. of the 8th. The following gives wind and pressure observations at the stations nearest to the centre at that hour:—

Station.	Pressure.			Wind.	
	Reduced to 32° sea-level and constant gravity.	Change during past 24 hours.	Variation from normal.	Direction.	Velocity in miles per hour.
	Inches.	"	"		
Saugor	29·582	—·017	—·125	WNW	6
Jubbulpore	·576	—·004	—·118	WSW	7
Sutna	·506	—·038	—·159	E	6
Nowgong	·531	—·087	—·139	ENE	3
Jhansi	·526	—·083	—·136	NNE	6

Pressure was nearly two-tenths below the normal at the centre. The winds in the area of depression were even feebler than on the 7th. Very heavy rain had fallen in the western and northern quadrants of the depression during the previous 48 hours. The following heavy downpours were recorded in the Jhansi district at 8 A.M. of the 7th and 8th:—

Date.	District.	Station.	Rainfall in inches.
7th	Jhansi	Garotha	12·90
		Pachwara	6·67
		Magarwara	6·79
8th	"	Moth	7·00
		Barwasaga	5·39
		Jhansi	3·71

The Agra, Muttra, Banda, and Hamirpur districts also received very heavy rain on the 7th and 8th.

The depression drifted very slowly westwards during the next 24 hours into the Jhansi and neighbouring districts, and the centre was a little to the south-west of Jhansi in Lat. 25¼° N. and Long. 78½° E. at 8 A.M. of the 9th. The following gives observation at stations in the central area:—

Station.	Pressure.			Wind.	
	Reduced to 32° sea-level and constant gravity.	Change since past 24 hours.	Variation from normal.	Direction.	Velocity in miles per hour.
	Inches.	"	"		
Nowgong	29·545	+·014	—·122	ESE	3
Jhansi	·523	—·003	—·135	E	2
Saugor	·601	+·019	—·099	WSW	12

Winds were very feeble at Jhansi and Nowgong which were nearest to the centre at this time; strong westerly winds were blowing across the Central Provinces and Central India, and were feeding into the cyclonic area. Winds had fallen off rapidly in strength in Bengal and Behar during the previous 24 hours, and rain had almost ceased to fall in these areas except in the coast districts. This was due to the setting in of light variable unsteady winds in the north-west angle of the Bay, which is the almost invariable antecedent to the formation of a depression at the head of the Bay in the rains.

Rain diminished rapidly in amount in and near the storm area in Central India, and the depression began to fill up during the day. It advanced slightly to the north-west, and the centre of the depression was nearly midway between Jhansi and Jeypore on the morning of the 10th. The barometric depression at the centre was less than a tenth of an inch, and the rainfall in the storm area was now moderate in amount. The depression filled up during the next 24 hours, and the observations of the 11th show no trace of its existence.

The storm was formed on the 5th under the usual conditions of storm generation at the head of the Bay in the rains. It was a well defined cyclonic circulation from the 6th to the 10th, the depression at the centre being during the whole of its existence less than two-tenths of an inch. Winds were light in the central area, but strong winds of indraught blew in the outer area of the depression. The storm was at first maintained chiefly by indraught from the Bay of Bengal, and in the later stages partly by indraught from the Arabian Sea. The indraught from the Bay of Bengal, however, decreased rapidly on the 10th, and the depression filled up on that day. During the advance of the storm across Chutia Nagpur and the North-Western Provinces, the heaviest rainfall undoubtedly occurred in the north-western quadrant or in front of the storm. The following gives a statement of the chief data respecting the storm:—

Date.	Position of Centre.		Distance travelled in preceding 24 hours.	Rate of motion per hour.
	Lat. N.	Long. E.		
	° ′	° ′	Miles.	Miles.
5th 8 A.M.	21 0	89 0	...	...
6th "	21 30	85 30	230	9·6
7th "	24 0	82 30	270	11·2
8th "	24 30	79 45	180	7·5
9th "	25 15	78 30	90	3·8
10th "	26 0	77 15	90	3·8

Depression of the 11th to the 16th September.—The depression formed in the north-west angle of the Bay on the 9th and 10th. Heavy rain began to fall in the coast districts and the north-west angle of the Bay on the 9th, and winds became light and variable on the 10th. The S.S. *Maharani*, in Lat. 15° 39′ N. and Long. 94° 6′ E., at noon of the 9th experienced moderate strong breezes in the morning and a moderate gale with heavy passing squalls and a high sea at midnight of the 9th. The S.S.

Umkuzi, in Lat. 18° 53′ N. and Long. 85° 2′ E., had light and variable winds during the 10th.

A very shallow depression, in which pressure was a tenth of an inch below the normal, covered this area on the morning of the 11th. The S.S. *Falls of Inversnaid* passed through it on that day and anchored at Saugor Island at 8 P.M. She had fresh north-east winds during the day with heavy squalls of wind and rain. The S.S. *Maharani* returning to Calcutta from Port Blair also passed through it, anchoring at Saugor Island at midnight. The following extract from her log shows clearly the weather in the eastern quadrant of the depression :—

Hour.	Wind.		Weather.
	Direction.	Force.	
4 A.M.	S.W.	5	Strong breeze with drizzling rain.
8 ,,	...	...	Fresh breeze, cloudy, overcast.
Noon	S.W.	4	Fine weather; passing clouds and light rain.
4 P.M.	...	...	Moderate breeze and cloudy.
8 ,,	...	...	Fine weather.
Midnight	S.W.	2	Fine, but cloudy.

A moderately strong monsoon was blowing in the centre and north of the Bay. In the area of depression itself winds were not strong, and weather was cloudy, with rain chiefly in the southern quadrant.

The disturbance was at this stage evidently very feeble. It, however, proved to be of long duration and gave a heavy burst of rain to Northern India during its existence. The depression advanced slowly westwards during the night of the 11th and was in North Orissa and the Midnapore district on the morning of the 12th. The following gives 8 A.M. observations in the storm area :—

Station.	Pressure.			Wind.	
	Reduced to 32° sea-level and constant gravity.	Change during past 24 hours.	Variation from normal.	Direction.	Velocity in miles per hour.
	Inches.	"	"		
Cuttack	29·614	—·036	—·043	SW	6
Balasore	·588	—·026	—·071	SSW	5
Chyebassa	·573	—·069	—·080	NE	3
Sambalpur	·577	—·086	—·085	NW	4

The depression was hence unchanged in character. Pressure was not more than a tenth of an inch below the normal at the centre, and winds were comparatively feeble in the central area. Excessively heavy rain had fallen in the western half of the depression during the previous 24 hours :—

District.	Station.	Rainfall of 24 hours preceding 8 A.M. of 12th.
		inches.
Cuttack	Cuttack	10·97
	Salipore	8·70
	Kendrapara	6·77
Sambalpur	Raigarh	7·68
	Sarangarh	6·30
	Sambalpur	5·69
	Bargarh	5·09

The rainfall in the north and east quadrants was, on the other hand, comparatively small in amount, and it would hence appear that the Bombay current, which was very strong at this period, was largely feeding into the indraught. The position of the centre at 8 A.M. was probably Lat. 21½° N. and Long. 85½°E. The depression advanced in a west-north-west direction during the night, and the centre at 8 A.M. of the 13th was in about Lat. 22¼° N. and Long. 83° E. The following table gives 8 A.M. pressure and wind observations at stations nearest to the centre :—

Station.	Pressure.			Wind.	
	Reduced to 32° sea-level and constant gravity.	Change during past 24 hours.	Variation from normal.	Direction.	Velocity in miles per hour.
	Inches.	"	"		
Hazaribagh	29·684	+ ·032	+ ·001	SSE	11
Benares	·660	—·016	—·001	ENE	4
Sutna	·655	—·016	—·019	N	5
Raipur	·610	—·082	—·064	W	15
Sambalpur					

The central depression was in the Raipur and Bilaspur Districts of the Central Provinces, and was shallow and of comparatively small extent. The cyclonic circulation maintaining it was, on the other hand, an extensive one, covering nearly the whole of North-Eastern India and the Central Provinces. Strong winds were blowing across the Central Provinces and feeding into it. The heaviest rainfall of the previous 24 hours has been received in the following districts :—

District.	Station.	Rainfall in inches.
Seoni	Lakhnadon	6·65
Bilaspur	Champa	5·80
Narsinghpur	Narsinghpur	5·88
Saugor	Rehli	4·74
Jubbulpore	Jubbulpore	4·25
	Sihora	4·35

The depression advanced into Baghelkhand during the next 24 hours, and the centre at 8 A.M. of the 14th was in Lat. 24¾° N. and Long. 81½° E. The following give

sure and wind observations at that hour at stations nearest the centre:—

Station.	Pressure.			Wind.	
	Reduced to 32° sea-level and constant gravity.	Change since past 24 hours.	Variation from normal.	Direction.	Velocity in miles per hour.
	Inches.	"	"		
Benares . .	29·674	+·014	+·009	E	6
Allahabad . .	·674	+·021	+·004	ENE	10
Sutna . . .	·664	+·009	—·015	N	8
Jubbulpore . .	·691	—·015	+·007	N	3

The depression had hence almost filled up during the previous 24 hours, but the cyclonic circulation was as extensive as on the preceding day, and heavy rain was now falling in the Jhansi and Lalitpur districts of the North-Western Provinces and in Rewah. The rainfall in the low pressure area was, however, not so excessive as hitherto. The storm drifted very slowly northwards during the next 24 hours, and the centre was near Allahabad at 8 A.M. of the 15th. The following observations indicate the character of the storm at this period:—

Station.	Pressure.			Wind.	
	Reduced to 32° sea-level and constant gravity	Change since past 24 hours.	Variation from normal.	Direction.	Velocity in miles per hour.
	Inches.	"	"		
Benares . .	29·639	—·035	—·031	SSE	2
Lucknow . .	·650	—·057	—·031	NE	2
Allahabad . .	·628	—·046	—·046	Calm	3
Sutna . . .	·649	—·015	—·035	N	5

The depression was now of little importance. Winds were very feeble, and rain was now falling in small amounts in the storm area.

The storm advanced into Central Oudh during the next 24 hours. During the day light showers were received in the eastern quadrant of the depression. It disappeared during the next 24 hours.

The storm was throughout of small intensity. Very heavy rain fell in the western half of the storm area during the first three days of its existence and maintained a well defined and extensive cyclonic circulation. The rainfall diminished in amount on the 14th and 15th, and the cyclonic circulation gradually decayed and the depression filled up on the 16th. The following gives data of the storm:—

Date.	Position of Centre.		Distance travelled in past 24 hours.	Rate of motion per hour.
	Lat. N.	Long. E.		
	° ′	° ′	Miles.	Miles.
11th 8 A.M.	20 15	88 30	...	...
12th	21 30	85 30	210	8·8
13th	22 15	83 0	170	7·1
14th	24 45	81 30	200	8·3
15th	25 30	81 30	50	2·1
16th	26 45	80 30	100	4·2

Shallow depression of September 17th to the 19th.—This depression formed in the north-west of the Bay on the 16th and 17th. The weather at this time was very squally, with frequent rain to the north-west of the Andamans. The S. S. *Japan*, in Lat. 16°45′ N. and Long. 91°31′ E. at noon of the 17th, had hard squalls with rain, and the S.S. *Gulf of Genoa*, in Lat. 15° 19′ N. and Long. 92° 30′ E, at noon, had light variable winds and incessant thick blinding rain during the greater part of the day. The centre of the depression, which was forming, was in about Lat. 18½° N. and Long. 88° E. The following extract gives the log of the S. S. *Straits of Magellan*, which was nearest the centre on the 17th, and in the western quadrant:—

Hour.	Position.		Wind.		Weather.
	Lat. N.	Long. E.	Direction.	Force.	
4 A.M.	...	...	W	...	Ugly threatening appearance.
8 "	...	...	N	2	Wind passed to north.
Noon	17° 57′	86° 40′	N	...	Misty hazy atmosphere; passing showers.
4 P.M.	...	...	Variable	...	Ditto.
8 "	...	...	E	6	Strong breeze and cloudy.

The centre of the depression was approaching the coast of Ganjam on the morning of the 18th. It crossed the coast shortly after noon and was transferred rapidly westwards during the day, and was in the western districts of the Central Provinces on the morning of the 19th. The following observations define its position and character at 8 A.M. of that day:—

Station.	Pressure.			Wind.	
	Reduced to 32°, sea-level and constant gravity.	Change during past 24 hours.	Variation from normal.	Direction.	Velocity in miles per hour.
	Inches.	"	"		
Seoni . . .	29·723	+·042	—·030	SE	5
Saugor . . .	·695	0	—·031	E	3
Indore . . .	·664	—·062	—·076	NNE	4
Khandwa . .	·662	—·050	—·085	W	7
Pachmarhi . .	...	—·006	—·048	ENE	...

The depression at the centre, which was in Lat. 21¾° N. and Long. 78° E., was less than a tenth of an inch, and the circulation was feeble. Moderate rain had fallen in the Central Provinces during the previous 24 hours. The indraught from the Bay of Bengal was falling off rapidly in strength in consequence of the appearance of another

depression (the most important of the month) in the Bay. Winds were light on the Bombay coast. The depression hence filled up during the day.

Depression of the 19th September to the 3rd October.—The first indications of this depression were given by the observations of the morning of the 19th, which showed that a well marked low pressure area and cyclonic circulation was advancing to Tenasserim from Upper Siam. The following wind and pressure observations at 8 A.M. of the 19th show its position and character at that hour:—

Station.	Pressure.			Wind.	
	Reduced to 32°, sea-level and constant gravity.	Change during past 24 hours.	Variation from normal.	Direction.	Velocity in miles per hour.
	Inches.	"	"		
Toungoo . .	29·707	—·067	—·060	NNE	3
Rangoon . .	·701	—·084	—·088	WNW	3
Moulmein . .	·690	—·095	—·108	Calm	2
Tavoy . . .	·758	—·039	?	NNW	1
Mergui . .	·745	—·004	...	S	2

From the sudden appearance of the storm, and its line of advance, it is almost certain that the depression originated quite outside of the Indian area, probably in the Gulf of Siam or the China Sea, and marched westwards. Strong westerly winds and very rainy and squally weather prevailed in the centre and south of the Andaman sea at this time. For example, the S. S. *Shahjehan*, in Lat. 13° 54′ N. and Long. 94° 33′ E, at noon of the 19th had thick squally weather with heavy rain during a considerable part of the day.

The depression advanced into the northern angle of the Andaman sea on the morning of the 20th. The following observations at 8 A.M. define its position:—

Position.	Pressure.			Wind.	
	Reduced to 32°, sea-level and constant gravity.	Change during past 24 hours.	Variation from normal.	Direction.	Velocity in miles per hour.
	Inches.	"	"		
Tavoy . . .	29·783	+·025	?	SSW	2
Moulmein . .	·731	+·041	—·073	E	1
Rangoon . .	·705	+·004	—·090	NNE	2
Diamond Island .	·723	—·049	—·067	NNW	6
Port Blair . .	·782	+·011	...	WNW	13

These observations indicate that the depression was at this stage shallow and feeble. This is clearly shown by the weather experienced by three vessels, one of which left Rangoon on the early morning, and the other two arrived at Rangoon during the day.

Ship.	Hour.	Position at noon on the 20th.		Wind.		Weather.
		Lat. N.	Long. E.	Direction.	Force.	
S.S. *Pentakota.*	2 40 A.M.	Left Rangoon.				
	8 A.M. .	...	...	Variable	...	Fine weather; slight rain.
	Noon .	15° 26′	95° 27′	Ditto	2	Light wind and thick drizzling rain.
	4 P.M. .	...	...	WSW	2	Light breeze and light rain.
	8 P.M. .	...	...	SW	2	Fine and clear weather.
S.S. *Nerbudda.*	4 A.M. .	Arrived at China Baker at 1-25 A.M. and left at 8-5 A.M., reaching Rangoon at 2-25 P.M.		NNW	...	Moderate breeze and fine throughout.
	8 A.M.			NNW	...	
	Noon			SE	...	
S.S. *Shajehan.*	4 A.M. .	...	...	NW	4 to 5	Squally, with heavy rain.
	Noon .	Arrived at Rangoon from Port Blair at 2-25 P.M.		E	4	Cloudy.

These extracts show clearly that the disturbance was feeble at this time, and that although weather was somewhat squally, fine weather with light winds obtained in the intervals between the squalls. Winds were, however, increasing at Port Blair, and a moderately strong monsoon prevailed in the centre of the Bay. The centre of the depression was in Lat. 15° 45′ N. and Long. 97° E. at 8 A.M. of the 20th. It appears to have passed over Diamond Island about 4 P.M., as the observer records a calm at that hour. Only seven miles of wind was recorded by the anemometer between 10 A.M. and 4 P.M. The depression passed through the Preparis Channel (the centre advancing very near to or over Diamond Island) in the afternoon about 4 P.M. and thence marched in a west-north-west direction across the Bay. The centre at 8 A.M. of the 21st was in about Lat. 17½° N. and Long. 91¼° E. The following give wind and pressure observations at that hour taken on board ships nearest to the centre:—

Ship.	Position.		Barometer.	Wind.		Weather.
	Lat. N.	Long. E.	Reduced to 32° and to Lat. 45° gravity.	Direction.	Force.	
S.S. *Pentakota.*	17° 30′	92° 30′	29·70	WSW	...	Fine, light showers.
S. *Garfield* .	16° 20′	90° 48′	29·71	W	6	Squally with rain.

Ship.	Position. Lat. N.	Position. Long. E.	Barometer. Reduced to 32° and to Lat. 45° gravity.	Wind. Direction.	Wind. Force.	Weather.
Claverdon .	17° 8′	89° 17′	...	WNW	...	Light airs; heavy rain.
S. *Polymnia*	17° 30′	90° 15′	29·70	N	...	Heavy steady rain.
Kohinur .	18° 40′	91° 30′	29·68	SE	5 to 6	Variable winds, squally weather and heavy rain.

The depression had hence intensified little, if at all, during the previous 24 hours. Winds were very unsteady in the area of depression, but weather was squally, and heavy rain was falling over nearly the whole area. The depression continued to advance in a WNW direction during the next 24 hours across the north of the Bay and was approaching the Orissa coast on the morning of the 22nd. The centre was in Lat. 20° 20′ N. and Long. 88° E. at 8 A.M. The following observations define its character at that period :—

Ship.	Position. Lat. N.	Position. Long. E.	Barometer. Reduced to 32° and to Lat. 45° gravity.	Wind. Direction.	Wind. Force.	Weather.
	° ′	° ′				
S. S. *Garfield*	19 0	89 40	29·68	SW	5	Hazy.
S. *Pegasus* .	16 15	89 15	29·75	NW	4	Moderate breeze; constant rain.
Claverdon .	19 15	88 30	...	SSW	4	Squally; heavy rain.
S. *Polymnia*	20 15	87 10	29·72	NE	4	Squally, with rain.
S. S. *Kangra*	19 40	89 50	29·68	SSW	6	Heavy rain squalls.
S. S. *Nadir* .	19 40	89 45	29·69	S	4	Moderate breeze, and cloudy.

These observations show most clearly that the storm had not intensified during its advance across the Bay of Bengal, and that it was a shallow but somewhat extensive depression in which light to moderate cyclonic winds obtained, and weather was more or less squally with frequent and heavy rain.

The centre crossed the coast a little to the south of False Point about 5 P.M. The amount of wind recorded by the anemometer at that station from 10 A.M. to 4 P.M. was only 55 miles. Moderately heavy rain was falling at this time in Orissa and South-West Bengal, but weather was fine and rainless over nearly the whole of Western and Central India. The depression advanced across the Orissa hills during the night of the 22nd, and was in the eastern districts of the Central Provinces at 8 A.M. of the 23rd. The following observations define its position and character at that hour : —

Station.	Pressure. Reduced to 32° sea-level and constant gravity.	Pressure. Change during past 24 hours.	Pressure. Variation from normal.	Wind. Direction.	Wind. Velocity in miles per hour.
	Inches.	"	"		
Cuttack . .	29·666	+·011	—·031	SW	5
Chyebassa . .	·683	+·010	. ?	ENE	4
Raipur . .	·639	—·129	—·079	WNW	7
Sambalpur . .	·550	—·075	—·130	ESE	8

The centre was probably a little to the south-west of Sambalpur in Lat. 22° N. and Long. 84° E., and the depression at the centre was almost certainly less than a sixth of an inch. No change of importance had hence occurred in the character of the storm in consequence of its advance over the Orissa hills. It was, as hitherto, a large shallow depression in which the lower cyclonic circulation was by no means strong, and in which moderately heavy rain was falling over the whole area, the rainfall being on the whole heaviest in the western quadrant. The largest rainfalls during the previous 24 hours had been registered in the Sambalpur and Raipur districts of the Central Provinces and the Cuttack district of Orissa.

The depression advanced in a west by north direction during the next 24 hours, and was in the central districts of the Central Provinces on the morning of the 24th. The following observations define its position and character at 8 A.M :—

Station.	Pressure. Reduced to 32°, sea-level and constant gravity.	Pressure. Change during past 24 hours.	Pressure. Variation from normal.	Wind. Direction.	Wind. Velocity in miles per hour.
	Inches.	"	"		
Raipur . .	29·637	—·002	—·091	SS	11
Seoni . . .	·646	—·116	—·144	NW	11
Nagpur . .	·633	—·067	—·115	WNW	10

The centre was in Lat. 21½° N. and Long. 80½° E. at that hour. Moderately strong winds prevailed in the Central Provinces. Winds were not only weak but very abnormal in direction on the coast of the Konkan, ranging between east and south. Hence the rainfall accompanying the storm was at this time almost entirely due to indraught from the Bay of Bengal, and was almost confined to the north-west, north and east portions of the depression. Little or no rain fell in the southern half of the depression. The fact that the Bombay current was not feeding into the depression made it very probable that the storm would recurve and advance in a much more northerly direction than hitherto. The depression drifted very slowly westwards during the next 24 hours and intensified considerably. The centre of the depression at 8 A.M. of the 25th

was a little to the west in Nagpur in Lat. 21½° N. and Long. 78½° E.

The following table gives observations taken at stations nearest to the centre at 8 A M :—

Station.	Pressure.			Wind.	
	Reduced to 32° sea-level and constant gravity.	Change during past 24 hours.	Variation from normal.	Direction.	Velocity in miles per hour.
	Inches.	"	"		
Amraoti	29·630	—·063	—·147	WNW	13
Nagpur	·496	—·137	—·260	SW	19
Seoni	·627	—·019	- ·171	E	8
Hoshangabad	·670	—·061	—·119	NNE	4
Pachmarhi	...	—·060	—·152	NW	...

The depression at the centre had hence increased to nearly three-tenths and steep gradients obtained near the centre. Cyclonic and stormy winds prevailed over the whole of Berar and the western districts of the Central Provinces, and heavy rain had fallen in the area of depression. The following give the largest amounts :—

District.	Station.	Rainfall, inches.	Date.
Wardha	Arvi	4·58	25th.
Nagpur	Nagpur	3 59	"
Hoshangabad	Pachmarhi	7·05	"
Betul	Multai	4·50	"

The storm now remained nearly stationary for some time. It drifted very slightly to the west during the afternoon of the 25th, and then continued unchanged in position until the afternoon of the 26th. The following observations show its position at 8 A.M. of the 26th :—

Station.	Pressure.			Wind.	
	Reduced to 32° sea-level and constant gravity.	Change during past 24 hours.	Variation from normal.	Direction.	Velocity in miles per hour.
	Inches.	"	"		
Amraoti	29·554	—·076	—·219	N W	16
Nagpur	·535	+·039	—·234	E S E	20
Hoshangabad	·619	—·051	—·169	N E	6
Khandwa	·645	—·068	—·146	N W	8
Pachmarhi	...	—·019	—·176	N E	...

The centre was midway between Amraoti and Nagpur, and the depression at the centre was probably nearly three-tenths, or the same in amount as on the 25th Strong cyclonic winds and gales continued in Berar and the western districts of the Central Provinces. Very heavy rain had fallen in Berar, and heavy general rain over the western districts of the Central Provinces. The wind at Nagpur changed from E S.E. at 8 A.M. to N.N.E at 10 A.M.; thus showing that the centre had recurved and was now passing northwards at 10 A.M. This is further confirmed by the wind directions at the neighbouring stations. The following table gives 4 P.M. data for Nagpur and neighbouring stations :—

Station.	Pressure.			Wind.	
	Reduced to 32° sea-level and constant gravity.	Change since past 24 hours.	Variation from normal.	Direction.	Velocity in miles per hour.
	Inches.	"	"		
Akola	29·508	—·045	—·141	W	14
Nagpur	·403	+·001	—·243	NNE	14
Hoshangabad	·480	—·053	—·188	NNE	7
Pachmarhi	...	—·042	—·186	NW	...
Seoni	·481	—·026	—·181	SE	8
Jubbulpore	·473	—·038	—·158	SSE	7

A noticeable feature in the form of the isobars at this period is that they had hitherto formed closed curves the direction of the longest axis running east and west, but they changed during the afternoon and night of the 26th, and the longest diameter of the storm area as defined by the isobars on the morning of the 27th ran north and south.

The storm centre at 8 A.M. of the 27th was crossing the Satpuras, or more properly the Maha Deoa hills, a little to the east of Pachmarhi. The following gives wind and pressure observations at stations in the central area :—

Station.	Pressure.			Wind.	
	Reduced to 32° sea-level and constant gravity.	Change since past 24 hours.	Variation from normal.	Direction.	Velocity in miles per hour.
	Inches.	"	"		
Jubbulpore	29·589	—·072	—·185	ESE	3
Saugor	·596	—·053	—·190	NE	2
Hoshangabad	·609	—·010	—·188	Calm	4
Pachmarhi	...	—·017	—·199	NW	...
Nagpur	·597	+·062	—·177	SSW	11

The depression had hence filled up slightly during the past 24 hours, but pressure at the centre was still upwards of two-tenths of an inch below the normal. Winds were moderate in the area of depression, but strong westerly winds continued in Berar and the western districts of the Central Provinces, and a strong and steady westerly air-current giving easterly winds prevailed over the Gangetic plain. Very heavy rain had fallen in Berar in the southern quadrant of the storm area, apparently due to a brief temporary indraught of westerly winds from the Arabian Sea and moderately heavy rain in the northern quadrant.

The storm advanced very slowly northwards during the day, and also began to recurve slightly to east. On the morning of the 28th it was crossing the Vindhyas, and the centre at 8 A.M. was almost midway between Jubbulpore

and Saugor. The following observations indicate the character of the storm at this period :—

Station.	Pressure.			Wind.	
	Reduced to 32° sea-level and constant gravity.	Change during past 24 hours.	Variation from normal.	Direction.	Velocity in miles per hour.
	Inches.	"	"		
Jubbulpore . .	29·599	+ ·010	−·184	SE	4
Saugor . .	·611	+ ·015	−·184	ENE	2
Pachmarhi . .	...	+ ·005	−·198	WNW	...
Nagpur . .	·631	+ ·034	−·153	SW	17

The depression was hence unchanged in character. Very heavy rain had again fallen in Berar, and heavy general rain had also been received in Bundelkhand, the Cawnpore, Sitapur, Kheri, Furruckabad, Shajehanpur, Jhansi, Lalitpur and other districts in the North-Western Provinces.

The centre curved rapidly to east during the afternoon of the 28th and advanced in a general N. E. direction past Jubbulpore into Baghelkhand. It was probably near Sutna at 8 A.M. of the 29th. The following observations define its position and character at that hour :—

Position.	Pressure.			Wind.	
	Reduced to 32° sea-level and constant gravity.	Change since past 24 hours.	Variation from normal.	Direction.	Velocity in miles per hour.
	Inches.	"	"		
Benares . .	29·668	− ·028	−·100	ESE	7
Allahabad . .	·621	− ·041	−·149	ENE	11
Sutna . . .	·609	− ·025	−·174	NNE	7
Jubbulpore . .	·691	+ ·092	−·103	WSW	6

Easterly winds had again set in at the Bombay coast stations, and rain was now falling chiefly in the northern quadrant of the storm area, but in smaller amounts than hitherto. Little or no rain was falling in the Bengal or Bombay coast districts. The depression was now slowly filling up.

It advanced into the eastern districts of the North-Western Provinces, the centre being to the south-east of Cawnpore at 8 A M. of the 30th. The following observations define its position at that hour :—

Station.	Pressure.			Wind.	
	Reduced to 32° sea-level and constant gravity.	Change since past 24 hours.	Variation from normal.	Direction.	Velocity in miles per hour.
	Inches.	"	"		
Sutna . . .	29·691	+ ·082	−·104	S	5
Allahabad . .	·690	+ ·069	−·087	Calm	8
Cawnpore . .	·654	+ ·023	[illegible]	ENE	6
Nowgong . .	·678	+ ·055	−·113	W	2

The history of the storm during the remainder of its existence is given in the October review.

This storm was a remarkable one, and in several respects resembled the largest storm of September 1888. It originated outside the Indian area and crossed the Malayan Peninsula into the north of the Andaman sea. It advanced rather rapidly in a west-north-west direction through the Preparis Straits and across the Bay of Bengal. It was throughout this period a shallow depression with feeble cyclonic winds. It crossed the Orissa hills and passed through the eastern districts of the Central Provinces into the central districts, where it was nearly stationary for 16 hours, during which it increased considerably in intensity. It then marched slowly to north and recurved to north-east, passing through Baghelkhand into the eastern districts of the North-Western Provinces and West Behar, in which it filled up slowly on the 3rd and 4th of October. The following gives a summary of data respecting this storm:—

Date.	Position of Centre.				Distance travelled in past 24 hours.	Rate per hour.
	Lat. N.		Long. E.			
	°	′	°	′		
20th	15	45	97	0	...	...
21st	17	30	91	15	400	16·7
22nd	20	20	88	0	200	12·1
23rd	22	0	84	0	286	11·9
24th	21	30	80	30	225	9·4
25th	21	30	78	30	135	5·6
26th	21	0	78	30	25	1·0
27th	22	30	79	0	100	4·2
28th	23	50	79	45	105	4·4
29th	24	15	80	30	60	2·5
30th	25	30	80	30	90	3·8

Summary of Special Storm Reports.

Cyclonic storms are of frequent occurrence in September, passing usually from the Bay into Central or Northern India. Local duststorms are of occasional occurrence in the driest districts of Upper India. The south-west monsoon rains occasionally terminate with a series of thunderstorms in Upper India.

Cyclonic storms were more frequent than usual in September 1891. The last storm of the month gave violent winds and gales in Berar.

The following gives a statement of the local dust and thunderstorms reported by observers during the month :—

2nd.—Duststorm (without rain) at Ludhiana from north-west lasted from 4-35 P.M. to 5-30 P.M. Severe duststorm without rain at Sirsa, which

came down from north-east at 5-40 P.M. and lasted until 9 P.M. Strongest winds, 24 miles per hour.

Duststorm with very slight rain (0·02 inch) at Lahore from 2 P.M. to 2-35 P.M. Storm came down from north. Temperature fell from 87° at 2 P.M. to 75·8° at 2-24 P.M. Barometer was steady throughout the storm, but fell rather rapidly as it passed away.

6th.—Duststorm passed from north to south over Aden between 4-20 P.M. and 5-25 P.M. Temperature and pressure were steady throughout the storm.

15th.—Severe thunderstorm at Hazaribagh 7-30 to 9 P.M.

Violent thunderstorm at Jubbulpore during the night. Heavy rain fell during the storm, which damaged buildings in the city.

20th—Duststorm at Aden from north-east from 4-55 P.M. to 5-30 P.M. Temperature and pressure were almost constant during the storm.

Duststorm (without rain) at Lahore from north from 5 to 6 P.M. Temperature fell from 94·0 from 5 P.M. to 80·2 at 5-45 P.M.

Thunderstorms at Pedong in Sikkim. They were not severe, but occurred much earlier in the season than usual.

21st.—Severe thunderstorm at Hazaribagh from 2-30 P.M. to 3-15 P.M.

Weather in the Bay of Bengal and Arabian Sea in the Month of September.

Bay of Bengal.—At the commencement of the month moderate to strong south-west monsoon winds prevailed over the Bay. Winds were strongest in the north of the Bay and off the Arakan coast, where weather was squally, with heavy rain. Thus the S.S. *Shahzada* in Lat. 20° 55′ N. and Long. 88° 48′ E. at noon of the 2nd had squalls and thick dirty rainy weather. This squally weather was due to a shallow depression which formed on the 1st off the Orissa coast and passed inland on the 2nd. Winds were moderate on the 3rd in the north of the Bay, with occasional squalls, but fresh steady south-west winds prevailed in the south of the Bay. On the 4th the S.S. *Megna* in Lat. 18° 26′ N. and Long. 80° 52′ E at noon had a moderate to strong gale during the day, with hard squalls and heavy rain. A small depression formed on the 5th in the north-west angle of the Bay and crossed the Orissa coast on the 6th. Moderate to strong winds prevailed over the greater part of the Bay on that day, and winds were very strong (force 6 to 7) off the Madras coast.

Weather improved slightly at the head of the Bay on the 7th and 8th, and was dull and gloomy with moderate south-west breezes on the 8th. Weather was very squally at this time in the Andaman sea and off the Arakan sea. Moderate to fresh winds prevailed on the 11th. A feeble depression developed on that day at the head of the Bay, and passed into Orissa on the 12th. Moderate winds, with fine weather, prevailed during the next five days at the head of the Bay, and strong winds in the south and centre of the Bay and the Andaman sea. The ship *Jumna* in Lat. 16° 42′ N. and Long. 89° 15′ E. at noon of the 15th had a black squall from north-west, with torrents of rain. On the 17th winds increased in strength in the east of the Bay, and weather became more squally, with frequent rain. The ship *Orange Grove* had a gale, with heavy squalls and rain on that day in Lat. 16° 44′ N. and Long. 92° 44′ E. The S.S. *Japan* in Lat. 16° 51′ and Long. 91°36′ at the same hour had hard squalls. A shallow depression formed on the 17th in the north of the Bay midway between the Arakan and Ganjam coasts, which advanced landwards on the 18th.

The weather improved after the advance of this cyclonic storm across the Ganjam coast on the 18th, and moderate to fresh breezes obtained from the 19th to the 21st over the greater part of the Bay. Weather became squally off the Arakan coast on the 21st, and winds increased during the next two days. Very heavy rain was reported by several vessels in the north of the Bay at this time. Thus the ship the *British Ambassador*, in Lat. 19° 18′ N. and Long. 88° 56′ E., at noon of the 24th, had heavy downpours of rain in the morning and a "tremendous downpour" in the afternoon. The weather improved on the 25th, and during the remainder of the month was fine, but cloudy, with moderate to fresh south-west monsoon breezes and occasional showers.

The weather at the entrance to the Bay was much more squally than usual during the greater part of the month.

Arabian Sea—The weather at the commencement of September in the Arabian Sea was very similar to that which had prevailed during the last week of August. Moderately strong monsoon winds were blowing in the centre and north of the Arabian Sea winds ranging in force from 4 to 6. Weather was apparently abnormal to the south of the equator as the S. S. *Chupra* in Lat. 9° 38′ S. and Long. 67° 31′ E., on the 3rd had on that day, and the 4th, east to north-east winds, with heavy squalls. Winds decreased in intensity to some extent at the end of the first week, and were of force 2 off the Bombay coast, force 4 off the Sind coast, and force 4 to 5 in the centre of the Arabian Sea.

They continued to decrease for some days off the Bombay

coast, and on the 12th, light airs to calms were reported by several vessels approaching Bombay. About the same time winds again increased to some extent to the east of Socotra. The S.S. *Cedar Branch* in Lat. 13° 43′ N. and Long. 57° 57′ E. at noon of the 6th, had strong monsoon winds (force 6), the S. S. *Clan Gordon* in Lat. 13° 20′ N. and Long. 57° 36′ E. at noon of the 14th had strong south-west winds (force 6), and a very heavy sea, and the S. S. *Ravenna* in Lat. 15° 15′ N. and Long. 55° 40′ E. at noon of the 17th experienced a strong monsoon (force 4 to 6) throughout the day. The weather was at the same time squally, with strongish winds, off the Malabar and Travancore coasts.

Winds began to increase again on the Bombay coast on the 20th. They were of force 2 to 4 off the Bombay and Sind coasts, and force 4 to 6 in the centre of the Arabian Sea, from the 20th to the 23rd.

No change of importance apparently occurred in the Arabian Sea until the 24th, when north-westerly winds were reported by several steamers approaching Bombay. At the same time winds decreased rapidly in force between Socotra and Bombay. Thus, on the 25th the *Inchbarra* in Lat. 18° 4′ N. and Long. 70° 44′ E. had light variable winds and rainy weather, the S. S. *St. Fellan* in Lat. 17° 32′ N. and Long. 64° E. had variable winds, the S. S. *Assam* proceeding from Aden to Bombay in Lat. 16° 25′ N. and Long. 61° 2′ E. had south-west winds (force 2) in the morning, and variable winds in the evening, and the S. S. *Darwin* in Lat. 15° 49′ N. and Long. 58° 35′ E. had light southerly winds (force 2). Similar winds and weather were experienced in the centre of the Arabian Sea during the remainder of the month, and the majority of vessels at this time experienced light south to west winds (force 2) between Socotra and the 68th meridian. Near the Bombay coast winds were light and very unsteady, but there was a strong tendency to north-westerly and northerly winds. Moderate monsoon winds, with squally weather, continued in the south-east of the Arabian Sea off the Malabar Coast.

Temperature of the Air.

The distribution of temperature in India for September 1891 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 in each of these charts 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 data by means of which these charts have been prepared are given in Table I. The mean maximum and minimum temperatures have been obtained for each station from the observations of the same number of years, *viz.*, 1878 to 1888. 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 amounts which vary from month to month. But the variation of the mean daily temperature from the normal, as determined by the use of this definition, agrees in almost all cases very closely with the variation as determined by the use of true daily means based on readings at 16 hours, in addition to those 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.

The temperature conditions of September are usually dependent on the distribution of rainfall during the month.

The rains in September 1891 were more abundant than usual in Lower Burma, Orissa, Chutia Nagpur, the North-Western Provinces and Oudh, the Punjab, Berar, the Central Provinces, Central India, North Hyderabad and the eastern districts of Rajputana. The rainfall was most excessive in the Central Provinces, Berar, the North-Western Provinces and Central India. It was in moderate defect in Bengal and Behar, and largely in defect in some parts of Madras, more especially the central and southern districts, and also in West and Central Rajputana.

The rains continued also even later than usual in Upper India, and the monsoon current did not withdraw from the Punjab until the beginning of the month of October, and hence south-west monsoon conditions prevailed more or less steadily over the whole of India until the end of the month.

The mean minimum temperature of the month was in excess in the Punjab, Rajputana, Sind, the North-Western Provinces, Behar, North Bengal and Assam, and also in the Peninsula to the south of Lat. 12°N. The variations were small and less than 2° except in two areas. The first included Rajputana and the West and Centra Punjab, and the second comprised the districts of Madura, Salem and

Tinnevelly in Madras. The following gives the variations at representative stations in these areas :—

DISTRICT.	STATION.	Variation of mean minimum from normal.
		°
Rajputana	Ajmere	+4·2
	Deesa	+3·2
	Jeypore	+2·1
Punjab	Sirsa	+3·6
	Lahore	+2·7
	Rawalpindi	+3·3
	Sialkot	+2·5
	Peshawar	+2·3
	Mooltan	+2·4
South Madras	Salem	+2·5
	Madura	+2·1

The deficiency over the remainder of India nowhere exceeded 1° except at Sutna. It should be noted that the minimum thermometers at Akyab, Diamond Island, Gopalpore, and probably Thayetmyo, were not in good order in September, and have been since replaced by new instruments. The variations for these stations for the month of September given in Table I are hence almost certainly erroneous.

The distribution of rainfall affected the maximum or day temperatures much more largely than the night temperatures. The mean maximum temperature of the month was more or less considerably in defect in the areas which received larger amounts of rain than usual, and the deficiency was greatest in the areas of most excessive rainfall. The following gives the variations at representative stations in the areas of increased rainfall :—

DISTRICT.	STATION.	Variation of mean maximum from normal.
		°
Central Provinces	Nagpur	—5·0
	Hoshangabad	—3·8
	Jubbulpore	—3·1
	Khandwa	—3·6
Berar	Akola	—2·8
	Amraoti	—3·4
Central India	Indore	—2·3
	Nowgong	—4·4
	Sutna	—1·1
North-Western Provinces	Meerut	—2·9
	Bareilly	—3·9
	Agra	—3·8
	Allahabad	—0·3
	Cuttack	—1·9
Orissa	False Point	—1·5
	Balasore	—1·0
Burma	Akyab	—1·0
	Rangoon	—0·4
	Moulmein	—1·1

The deficiency ranged from 2° to 5° in Berar, the Central Provinces, the southern districts of Central India, and the western districts of the North-Western Provinces, and was greatest at Nagpur. The mean maximum temperature was above the normal in the areas of deficient rainfall. The excess was more than 2° in three areas—1st, North Bengal and Behar; 2nd, West Punjab, Sind and West Rajputana; and, 3rd, South and Central Madras. The following table gives the largest variations in these three areas :—

DISTRICT.	STATION.	Variation of mean maximum from normal.
		°
North Bengal and Behar	Dhubri	+2·5
	Durbhanga	+2·9
	Dinajpore	+2·1
West Punjab, Rajputana and Sind	Deesa	+4·5
	Ajmere	+3·5
	Jacobabad	+3·9
	Mooltan	+3·7
	Peshawar	+2·6
South and Central Madras	Salem	+6·5
	Madura	+3·7
	Madras	+3·5
	Bangalore	+3·4

Salem was in the midst of the area of drought in Madras and Deesa and Ajmere of the drought area in West Rajputana.

The mean temperature of the month was below the normal in Lower Burma, Orissa, Chutia Nagpur, the North-Western Provinces, Central India, Berar, the Central Provinces and Hyderabad. The negative variations were less than 2°, except in the area of most excessive rainfall in the Central Provinces, for which data are given in the following table :—

STATION.	VARIATION OF MEAN TEMPERATURE FROM NORMAL.	
	From Table I.	From Table II.
	°	°
Nagpur	—2·7	—2·7
Raipur	—2·1	—2·0
Hoshangabad	—2·2	—3·0
Pachmarhi	—2·1	—2·0
Chanda	...	—2·3

The mean temperature of the month was in excess over the remainder of India. The positive variations exceeded 2° in the two drought areas in North-Western and Southern India. The following gives data for these areas. :—

METEOROLOGICAL PROVINCE OR DIVISION.	STATION.	VARIATION OF MEAN TEMPERATURE FROM NORMAL.	
		From Table I.	From Table II.
		°	°
West and Central Rajputana, Upper Sind, and West Punjab	Deesa	+3·9	+3·6
	Ajmere	+3·9	+3·
	Jacobabad	+2·9	+2·
	Mooltan	+3·1	+4·
	D. I. Khan	+2·3	...
	Peshawar	+2·5	+2·8
	Lahore	+2·0	+3·0
South India	Salem	+4·5	+4·2
	Madura	+2·9	...
	Trichinopoly	+2·5	+2·5
	Madras	+2·6	+0·9
	Bangalore	+2·3	...
	Negapatam	+2·7	...

The following gives a brief statement of the more important temperature changes during the month.

A short partial break in the rains prevailed over the greater part of North-Western India at the commencement of the month, and temperature was generally above the normal. The maximum, or day, temperature at this time was excessive in Upper Sind and West and Central Rajputana. On the 4th and 5th it was from 9° to 13° above the normal in that area. The rainfall in the interior began to increase in amount on the 5th, and temperature decreased to some extent in Central and North-Western India. Heavy rain was falling at this time in Central India and the Central Provinces, and the day temperature was almost as largely below the normal on the 7th and 8th in these areas as it was above it in Sind and Rajputana on the 3rd, 4th and 5th. Rainfall extended to Central Rajputana on the 8th and 9th, and caused a very large and rapid reduction of temperature. The following gives maximum temperature data for stations in that area on the 8th and 9th. :—

Station.	Maximum Temperature of 24 hours preceding 8 A.M. of date.		Fall in 24 hours.
	8th.	9th.	
	°	°	°
Ajmere	97·9	82·5	15·4
Sambhar	96·5	82·9	13·6
Jeypore	94·1	80·0	14·1

The rainfall during the 24 hours ending at 8 A.M. of the 9th in Central Rajputana did not exceed an inch at any of the reporting stations.

Temperature increased in the Punjab and Rajputana from this period until the 20th and was excessive on that day in the North and Central Punjab. The day temperature of the 18th, for example, was 5° above the normal, and the night temperature 8½° in excess in that area. The temperature conditions over the remainder of India varied very little during this period, the chief features being persistently low temperature in Central India, Berar and the Central Provinces, and excessive temperature in the Madras area of drought (more especially at Salem). A cyclonic storm which advanced from the Bay across the Central Provinces and Central India gave a general burst of rain to the whole of Northern and Central India, and a cool period from the 22nd to the end of the month. Southern India also received frequent showers during the last week of the month, which reduced temperature in that area very considerably. During the last five days of the month the only area in which there was a considerable excess of temperature included Sind and West Rajputana.

The highest maximum temperatures of the month were registered during the first and second weeks of the month. The hottest areas were :—

1st.—Upper Sind, West Rajputana and the South-West Punjab.

2nd.—South Madras.

The following gives the highest maximum temperatures registered at stations in these areas :—

Meteorological Province or District.	Station.	Highest temperature observed during the month.	Date.
		°	
Upper Sind	Jacobabad	112·2	4th & 11th.
	Hyderabad	106·2	28th
West Rajputana	Bickaneer	108·5	5th
	Pachpadra	105·0	3rd
South-West Punjab	Moultan	110·2	3rd
	Montgomery	110·4	3rd
South Madras	Madura	102·4	13th & 14th.
	Salem	101·9	17th

The hottest period in Southern India was from the 14th to the 17th.

The following table gives the variations of the mean temperature from the normal, week by week, during the month and also for the whole month, in the larger Provinces :—

Province.	Difference of Mean Temperature from Normal for week ending September.				Difference of mean temperature from normal for the month.
	5th	12th	19th	26th	
	°	°	°	°	°
Burma	—1·1	—0·7	—0·7	—1·1	—0·8
Bengal and Assam	+1·1	+0·8	0	+0·2	+0·5
North-Western Provinces and Oudh	0	—1·1	—0·2	+0·2	—0·7
Punjab	+1·0	+1·0	+3·2	—0·1	+1·4
Bombay	—0·2	+0·2	+0·6	+0·5	+0·2
Central Provinces and Berar	+0·3	—1·8	—1·9	—1·6	—1·8
Guzerat and Central India	+2·3	+0·3	0	—0·1	+0·3
Sind and Rajputana	+4·9	+0·1	+1·7	+1·8	+1·9
Madras	+1·7	+2·4	+2·4	+1·2	+1·7

Winds.

The mean wind directions at 8 A.M. during the month are shown in Plate I by arrows flying with the wind. They are obtained by the use of Lambert's formula in which equal value is given to every wind. The data are given in Table I. The mean wind directions derived from the wind observations at 10 A.M and 4 P.M are given in the small chart (No. IV of Plate III) by means of arrows flying with the wind. The data for these will be found in Table II, together with the normal directions as obtained from the observations of the past 10 to 20 years.

The south-west monsoon current usually withdraws from Upper India before the end of the month, and winds are generally lighter and more variable in the Punjab in September than in any other month of the year. Westerly winds sometimes set in before the end of the month and extend over the western districts of the North-Western Provinces and Rajputana.

South-west monsoon winds prevail during the month in North-Eastern India and the Peninsula generally, but they usually fall off very considerably in strength during the month.

The following gives comparative data of the strength of the south-west monsoon winds at representative stations in the months of July, August and September :—

Station.	Mean Velocity in Miles per day.					
	July.		August.		September.	
	Actual, 1891.	Normal.	Actual, 1891.	Normal.	Actual, 1891.	Normal.
Bombay	435	454	385	384	272	274
Belgaum	770	669	599	497	453	400
Nagpur	297	189	218	144	237	118
False Point	305	263	246	239	240	195
Saugor Island	315	341	323	299	304	241
Calcutta	140	124	121	125	112	103
Patna	154	89	150	81	156	70
Allahabad	232	100	170	91	152	75

The Bombay current, although fairly steady throughout the month, was, on the whole, weaker than usual. The following gives data for representative stations at which the exposure of the anemometer is satisfactory :—

Station.	Velocity.	
	Mean daily wind velocity, September 1891.	Normal mean daily wind velocity, September.
	Miles.	Miles.
Bombay	272	274
Ratnagiri	177	188
Belgaum	453	400
Sholapur	196	236

The Bay current was unsteady and very variable in force during the month in consequence of the unusually large number of cyclonic storms which appeared and passed over it. It was, on the average of the month, stronger than usual, as is shown by the following data :—

Station.	Velocity.	
	Mean daily wind velocity, September 1891.	Normal mean daily wind velocity, September.
	Miles.	Miles.
Saugor Island	304	241
False Point	240	195
Calcutta	112	103
Dacca	151	111
Hazaribagh	230	169
Patna	156	70

Winds were on the whole slightly stronger and steadier in Burma and at Port Blair. The wind directions had a very strongly-marked westerly element, as is shown by the following data :—

Station.	Direction.		Steadiness.	
	Mean wind direction, September 1891.	Normal mean wind direction, September.	Average percentage, September	Normal percentage.
	°	°		
Port Bair	S 68 W	S 43 W	81	73
Diamond Island	S 68 W	S 39 W	62	58
Mergui	N 73 W	S 64 W	72	59
Akyab	S 2 W	S 9 E	43	41

The abnormal westing of the winds was hence very strong in the Andaman sea and the south-east of the Bay, and was an important feature of the air movement in the Bay.

In Bengal winds were much more easterly than usual, more especially in the southern districts, *e.g.*,—

Station.	Direction.	
	Mean wind direction, September 1891.	Normal mean wind direction, September.
	°	°
Saugor Island	S 25 E	S 4 W
Calcutta	S 41 E	S 27 E
Dacca	S 15 E	S 11 E

This was chiefly an effect of the depressions which advanced from the north of the Bay to the Orissa or Ganjam coasts. In the Gangetic plain winds were much steadier and stronger than usual and differed little from their mean direction. The following gives some examples showing the unusual steadiness and strength of the winds in the Gangetic plain :—

Station.	Steadiness.		Velocity.	
	Average, September 1891.	Normal, September.	Average daily air movement, September 1891.	Normal daily air movement, September.
	%	%	Miles.	Miles.
Hazaribagh	59	21	230	169
Patna	85	42	156	70
Allahabad	52	11	152	75
Agra	35	13	95	99
Roorkee	22	9	32	49

The steadiness decreased in percentage amount westwards, but the increase in the steadiness relatively to the normal was as marked at the western as at the eastern

stations. Winds were even more unsteady than usual in the East Punjab and were very irregular in direction, *e. g.*,—

Station.	Direction.		Steadiness.	
	Average direction, September 1891.	Normal direction, September.	Average, September 1891.	Normal, September.
	°	°	%	%
Murree	S 74E	S 52 E	2	8
Lahore	S 31 W	N 60 E	8	13
Ludhiana	N 61 W	N 40 W	8	13

In Sind and Rajputana winds on the whole were slightly steadier than usual, and were of normal strength. The westerly winds at these stations contained a strongly marked northerly element and were hence drier than usual. The following data show the area of extension of these abnormal west-north-westerly winds :—

Station.	Direction.	
	Average direction, September 1891.	Normal direction, September.
	°	°
Kara	N 83 W	S 62 W
Ajmere	N 62 W	S 80 W
Mount Abu	N 80 W	S 67 W

The mean wind direction at Deesa for the month was S. 85° W., the normal being S. 65° W.

Winds were practically normal in direction over nearly the whole of Central India, Berar, and the Central Provinces. The average amount of wind during the month was largely above the mean, more especially in Berar. This was chiefly owing to the very strong winds which prevailed in Berar and the western districts of the Central Provinces during the third and fourth weeks of the month. The following gives data :—

Station.	Velocity.	
	Average daily air movement, September 1891.	Normal daily air movement, September.
	Miles.	Miles.
Akola	262	139
Buldana	229	194
Chikalda	347	224
Khandwa	189	145
Hoshangabad	141	58

Winds were steadier on the Bombay coast and were pratically normal in direction.

Humidity and Cloud.

The hygrometric data for 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 the minimum of the 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 *Vade-Mecum*, which are 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 5 to 20 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 amounts at 10 and 16 hours, and the normal means, with which the actual daily means of the month are computed, are the means for periods varying from 5 to 25 years of the available cloud data for the same hours.

The air contained more vapour than usual in the East Punjab and at the hill stations, but in consequence of the higher temperature than usual the humidity was slightly in defect. There was a moderate deficiency in Sind and West Rajputana, and humidity was also below the average.

There was a moderate to a large excess in the amount of vapour in the air in the western and southern districts of the North-Western Provinces and in Central India, and the Central Provinces, and the humidity was considerably above the normal in the whole of that area. The following gives data for the stations at which the humidity was most excessive :—

Division.	Station.	Variation from the Normal.	
		Aqueous vapour.	Humidity.
		"	%
N.-W.-Provinces	Meerut	+·118	+21
	Agra	+·136	+17
	Lucknow	+·084	+ 9
Central Provinces	Saugor	+·085	+13
	Hoshangabad	+·054	+12
	Jubbulpore	+·038	+10
	Nagpur	+·036	+10
Central India	Nowgong	+·087	+15
	Sutna	+·086	+12

The air contained slightly more moisture in Behar, Orissa,

and Chutia Nagpur, and less in Bengal. In consequence of ncreased temperature over the greater part of this area, the humidity was somewhat less than usual. The decrease was greatest at Dhubri (—4), Dacca (—4) and Darjeeling (—4).

The air was damper in the Bombay coast districts and the Deccan, but the variations were small and of little importance.

The amount of cloud was in excess of the normal over the whole of India with slight exceptions, the chief of which were Sind, North Bengal, North Behar and the Konkan. In these areas the deficiency was small, and was absolutely greatest at Durbhanga (—1·4), Kurrachee (—1·1) and Sibsagar (—0·9). The increased amount of cloud was most marked in the North-West Provices, the Central Provinces and Berar, and at the hill stations in Upper India. The following gives average cloud data for these areas:—

	Average cloud for September 1891.	Normal mean, cloud amount September.	Variation from normal.
North-Western Provinces	6·7	4·5	+2·2
Central Provinces	8·4	6·2	+2·2
Berar	9·0	7·2	+1·8
Hill stations in Upper India	6·5	4·6	+1·9

The variations at stations in the coast districts of Bombay and Bengal were small, but the average cloud amount during the month was considerably less in the coast districts of Bombay and Bengal than in the districts of excessive rain in the interior.

There was a slight increase of cloud in Burma, and also at the extra-Indian stations of Quetta and Leh.

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 offices of the Meteorological Reporter, Director of Land Records, or other Officer in the province and published in the Provincial Gazette. 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 September 1891 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. 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 160 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 indicating the rainfall. The line of no rainfall is indicated by two parallel lines separated by a short distance —one continuous and the other dotted, the latter facing the districts of no rainfall.

The second chart illustrating the distribution of the rainfall of the month is given in Plate V, and shows by figures the variation of the mean actual rainfall of the month from the normal rainfall in each of the 51 meteorological districts into which India and Burma have been divided for purposes of comparing crops, and rainfall. The data of this chart are deduced from the rainfall information telegraphed by District Officers, of which a summary is given in the following table, and the actual figures utilized are those given in the last column. The numbers given in the centre of each district are the variations of the actual mean rainfall of the district from the normal mean rainfall; a number given in a corner of each district in small slanting figures serves as an index, by means of which, in referring to the list of districts at the foot of the chart, the name of the district can be at once ascertained.

The distribution of the rainfall was very largely determined by the tracks of the cyclonic storms and depressions of the month.

The following gives the periods of large inflow of aqueous vapour from the Bay of Bengal and of general rainfall over the greater part of Northern and Central India:—

1st.—From the 3rd to the 5th, when the whole of North-Eastern and Central India received moderately heavy rain.

2nd.—From the 6th to the 10th. Orissa, the Central Provinces, and the southern districts of the North-Western India and the eastern districts of Central India and Rajputana received heavy cyclonic rain during this period. The rainfall was excessive in Orissa, Bundelkhand, Jhansi and Bhurtpur.

3rd.—From the 12th to the 16th. The whole of Bengal, Behar, Chutia Nagpur, the Central Provinces, the North-Western Provinces and the

eastern districts of Central India obtained moderate rain during this period.

4th.—From the 17th to the 19th. North-Eastern India, the Central Provinces and the Deccan received moderate rain during this influx.

5th.—From the 22nd to the 30th. During this period a cyclonic storm gave a heavy burst of rain to Orissa, the Central Provinces, Berar, the eastern districts of Central India and the North-Western Provinces, and light to moderate rain to Bengal, Behar and Chutia Nagpur.

The chief periods of influx of the Bombay monsoon current and of general rainfall in the West coast districts and the Peninsula were :—

1st.—From the 1st to the 11th—Very heavy rain fell in the West coast districts during the first four days of this period, and the whole of the Deccan obtained moderate rain.

2nd.—From the 16th to the 20th—This was a comparatively feeble influx, but gave moderate rain to the North Deccan and coast districts.

3rd.—From the 24th to the 28th—This was also a feeble burst. It gave heavy rain to Berar and moderate rain in the centre and the south of the Peninsula.

The chart (No. 4) shows the distribution of the rainfall of the month. In drawing the lines of equal rainfall the rainfall at the hill stations is not taken into account.

There were four areas in which the rainfall of the month exceeded 20 inches. These were :—

1st.—The greater part of the Central Provinces, Jhansi, and Bhurtpore.

2nd.—The Konkan and West Ghats.

3rd.—Silchar and the Khasi Hills.

4th.—Arakan, Tenasserim, and the coast districts of Lower Burma.

The rainfall decreased from these areas towards four areas of very light rainfall. These were :—

1st.—Sind, the West Punjab, and West Rajputana, in which the rainfall was less than one inch.

2nd.—A belt of country in the Peninsula stretching from Bijapore to Coimbatore, in which the total rainfall was less than one inch.

3rd.—The central districts of Upper Burma, in which the rainfall was less than five inches.

4th.—Behar and Central Bengal, in which the rainfall of the month was generally less than five inches.

The following table gives comparative data of the rainfall in each of the 52 meteorological districts into which India is divided :—

Province	Division.	Average Actual Rainfall of Division.					Total rainfall during the month.	Normal average rainfall during the month.	Variation from normal.
		1st to 5th Sept. 1891.	6th to 12th Sept. 1891.	13th to 19th Sept. 1891.	20th to 26th Sept. 1891.	27th to 30th Sept. 1891.			
		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Burma	Tenasserim	8·81	10·30	5·32	12·00	1·20	37·63	27·48	+ 10·15
	Lower Burma	4·55	5·78	4·07	5·24	0·26	19·90	14·50	+ 5·40
	Central do.	3·99	3·90	2·62	4·20	0·59	15·30	12·01	+ 3·29
	Upper do.	1·15	1·65	1·13	1·53	0·58	6·04	?	?
	Arakan	6·74	3·68	4·44	3·62	1·06	19·54	21·50	— 1·96
Bengal and Assam	Eastern Bengal	1·04	0·53	1·68	2·33	0·27	5·85	12·13	— 6·28
	Assam (Surma)	4·66	2·31	4·76	1·82	3·55	17·10	22·22	— 5·12
	Do. (Brahmaputra)	1·41	0·91	1·82	0·52	1·39	6·05	9·84	— 3·79
	Deltaic Bengal	1·28	1·36	1·38	2·05	0·37	6·44	7·98	— 1·54
	Central do.	0·82	0·68	1·32	1·03	0·33	4·18	9·32	— 5·14
	North do.	1·15	1·07	3·04	0·87	2·27	8·40	16·39	— 7·99
	Orissa	1·91	6·42	1·98	6·59	0·37	17·27	9·78	+ 7·49
	Chutia Nagpur	1·73	1·60	2·99	2·21	0·53	9·06	7·87	+ 1·19
	Behar (South)	0·68	0·83	1·41	0·74	0·51	4·17	6·80	— 2·63
	Do. (North)	0·70	0·18	1·83	0·74	0·94	4·39	9·31	— 4·92
North-Western Provinces and Oudh.	North-Western Provinces (East)	1·53	1·46	1·90	0·60	0·92	6·41	6·56	— 0·15
	Oudh (South)	2·76	1·40	1·86	1·17	1·75	8·94	6·16	+ 2·78
	Do. (North)	4·75	1·31	2·34	0·58	3·86	12·84	6·77	+ 6·07
	North-Western Provinces (Central)	1·45	2·94	2·05	1·88	1·82	10·14	5·11	+ 5·03
	Do. do. (West)	0·76	3·94	1·96	2·25	1·37	10·28	4·31	+ 5·97
	Do. do. (Submontane)	2·19	1·75	1·77	1·35	2·63	9·69	6·22	+ 3·47
Punjab	Punjab (South)	0·04	0·61	0·24	0·78	0·03	1·70	1·70	0
	Do. (Central)	0·26	2·19	0·65	1·25	0·18	4·53	3·28	+ 1·25
	Do. (Submontane)	0·09	0·44	0·93	1·75	0·30	3·51	3·39	+ 0·12
	Do. (Hill Districts)	0·95	1·25	3·41	4·53	0·85	10·99	5·81	+ 5·18
	Do. (North-West)	0·33	0·11	0·20	1·05	0·21	1·90	2·06	— 0·16
	Do. (West)	0·06	0·04	0	1·06	0	1·16	0·60	+ 0·56

Province.	Division.	Average Actual Rainfall of Division. 1st to 5th Sept. 1891.	6th to 12th Sept. 1891.	13th to 19th Sept. 1891.	20th to 26th Sept. 1891.	27th to 30th Sept. 1891.	Total rainfall during the month.	Normal average rainfall during the month.	Variation from normal.
		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Bombay and Malabar coast districts (Madras).	Malabar	1·64	1·16	0·61	0·31	0·38	4·10	9·38	— 5·28
	Madras (South Central)	0·36	0·16	0·18	0·57	1·21	2·48	5·38	— 2·90
	Coorg	3·04	1·54	0·66	0·81	0·69	6·74	11·98	— 5·24
	Mysore	0·38	0·24	0·08	0·11	1·02	1·83	4·93	— 3·10
	Konkan	5·29	3·23	2·12	4·38	1·42	16·44	15·25	+ 1·19
	Bombay, Deccan	1·55	0·25	0·20	0·56	0·62	3·18	5·59	— 2·41
	Hyderabad (North)	...	...	...	...	...	...	...	...
	Khandeish	2·28	0·38	0·44	1·20	0·25	4·55	6·63	— 2·08
Central Provinces and Berar.	Berar	2·31	0·61	1·20	6·83	3·87	14·82	6·37	+ 8·45
	Central Provinces (West)	1·64	2·50	2·99	4·39	3·38	14·90	7·49	+ 7·41
	Do. (Central)	2·04	7·00	7·70	3·75	2·95	23·44	7·05	+ 16·39
	Do. (East)	1·47	4·81	5·80	3·22	0·33	15·63	6·74	+ 8·89
Bombay (North)	Guzerat	1·74	0·39	1·22	2·28	0·46	6·09	6·88	— 0·79
	Kathiawar	0·24	0·10	0·11	2·65	0·06	3·16	3·53	— 0·37
	Sind	0	0	0	0·17	0·09	0·26	0·46	— 0·20
Rajputana and Central India.	Central India (East)	1·46	3·52	2·42	2·20	1·27	10·87	5·93	+ 4·94
	Rajputana (East), Central India (West)	0·08	3·53	0·57	1·51	0·37	6·06	3·82	+ 2·24
	Rajputana (West)	0	0·04	0·06	0·40	0	0·50	2·35	— 1·85
Madras	East Coast (North)	1·01	0·51	1·23	2·35	0·66	5·76	6·95	— 1·19
	Do. (do.) (a)	1·46	3·10	2·70	1·55	0·37	9·18	8·24	+ 0·94
	Hyderabad (South)	3·20	0·79	0·17	0·60	1·04	5·80	4·66	+ 1·14
	Madras (Central)	0·70	0·04	0·08	0·18	0·78	1·78	5·31	— ·353
	East Coast (Central)	0·62	0·07	0·73	1·94	1·25	4·61	4·93	— 0·32
	Do. (South)	0·31	0·08	0·42	0·61	1·09	2·51	5·14	— 2·63
	Madras (South)	0·01	0·05	0·31	0·43	0·62	1·42	3·21	— 1·79

In Tenasserim, Lower and Central Burma and Arakan rain fell daily until the 25th, when an almost complete break set in and lasted until the end of the month. Upper Burma also received more frequent showers in September than during the previous months of July and August. The periods of most general rain in that division of the province were from the 8th to 10th, the 17th and 18th and the 23rd to the 25th.

The rainfall of the month exceeded four inches at all the rainfall stations in Upper Burma, except the five stations for which data are given in the following table :—

District.	Station.	Total Rainfall of Month of June.	July.	August.	September.
		Inches.	Inches.	Inches.	Inches.
Kyaukse	Kyaukse	6·59	0·28	2·75	2·17
Sagaing	Myotha	7·26	2·39	2·26	1·44
Minbu	Minbu	4·36	2·53	2·35	2·82
Shwebo	Tantabin	8·70	2·78	4·63	2·15
Katha	Katha	5·28	6·46	4·73	3·24

The rainfall of the month ranged from 45 inches on the Tenasserim coast and 35 inches in Arakan, to 2 inches at the driest stations in Upper Burma. It varied little from the normal over the whole province, and was generally in slight excess, except in some parts of Upper Burma, more especially the districts of Kyaukse, Minbu, Shwebo and Sagaing. The following table gives a summary of the rainfall data of the province as published in the monthly statement :—

Division.	Rainfall. Actual rainfall.	Normal rainfall.	Variation from normal.	Number of Rainy Days. Actual.
	Inches.	Inches.	Inches.	
Tenasserim	39·54	27·48	+ 12·06	27·2
Lower Burma	19·58	14·50	+ 5·08	21·9
Central do.	13·37	12·01	+ 1·36	17·4
Upper do.	5·87	P	P	10·0
Arakan	19·64	21·50	— 1·86	21·4

The rainfall of the month in Assam was considerably below the average in the eastern and central districts of the Brahmaputra Valley. The following gives data for representative stations :—

District.	Station.	Total rainfall for the month.	Average rainfall for the month.	Variation from normal.
		Inches.	Inches.	Inches.
Goalpara	Dhubri	4·87	12·05	—7·18
	Goalpara	3·97	11·96	—7·99
Kamrup	Gauhati	2·58	7·79	—5·21
Darrang	Tezpore	4·97	9·16	—4·19
Nowgong	Nowgong	6·65	10·90	—4·25

The rainfall was practically normal in Sibsagar and Lakhimpur, and in moderate defect in Cachar. Cherrapunjee received 32·0 inches, 24 inches less than its normal amount. The chief periods of rainfall were from the 1st to the 6th, from the 13th to the 16th, and from the 25th to 30th. The falls were, as a rule, very light.

The chief periods of heaviest and most general rainfall in Bengal were from the 1st to the 6th, 10th to the 13th, 17th to the 19th, and 22nd to 27th. The rainfall during all of these periods was heaviest in Orissa and South-West Bengal. In Behar and North Bengal (except Cooch Behar, Julpigoree and Darjeeling) the rainfall was small in amount, and occurred as light local showers. Orissa received very heavy downpours on the 12th and the 22nd and 23rd. The following table from the Bengal monthly weather summary shows more fully than the data of the rainfall table above the character of the rainfall in different parts of that province:—

Meteorological division.	September.					
	Rainfall.			Number of Rainy Days.		
	Average, September 1891.	Normal average, September.	Variation.	Average, September 1891.	Normal average, September.	Variation.
	Inches.	Inches.	Inches.			
Orissa	18·45	10·25	+8·20	18·73	12·52	+6·21
South-West Bengal.	6·45	9·04	—2·59	12·70	11·94	+0·76
East Bengal	6·10	12·08	—5·98	11·90	13·46	—1·56
North Bengal	4·96	13·42	—8·46	8·08	12·27	—4·19
North Behar	3·43	9·85	—6·42	6·19	9·64	—3·45
South Behar	4·50	7·98	—3·48	8·80	10·21	—1·41
Chutia Nagpur	8·92	8·71	+0·21	15·18	12·67	+2·51

Rainfall was excessive over the whole of Orissa. Cuttack registered the largest amount, *viz.*, 30·95 inches, or 20·88 inches in excess of the normal fall. There was a slight excess in Chutia Nagpur and South-West Bengal, but over the remainder of the province the rainfall was in defect. The deficiency was very large in North Behar, averaging 53 per cent, Central Bengal, in which it averaged 55 per cent., and North Bengal, for which it averaged 48 per cent., according to the data of the general rainfall table above, and the deficiency was even greater than this in North Bengal and North Behar according to the more accurate data of the Bengal monthly summary, which is based on the complete monthly rainfall data of the province. Hence over the whole of North and Central Bengal and North Behar less than half the normal rainfall of the month was received.

The rainfall was very irregularly distributed, and several districts and stations which usually receive heavy rainfall in this month, obtained very small amounts. The following are the most striking examples of this local deficiency:—

District.	Rainfall of District.			Station.	Actual.	Normal.	Variation from normal.
	Actual.	Normal.	Variation from normal.				
	Inches.	Inches.	Inches.		Inches.	Inches.	Inches.
Rungpore	3·25	13·44	—10·19	Bagdogra	1·70	15·52	—13·82
Dinagepore	4·22	11·32	—7·10	Dinagepore	2·04	11·14	—9·10
Durbhanga	2·23	9·25	—7·0.	Roshera	0·95	?	?
South Bhagulpore	4·85	7·92	—3·07	Bongaon	0·58	?	?
Mozufferpore	2·19	8·99	—6·80	Sinhar	*Nil*	?	?

The rainfall of the month was more or less excessive over the greater part of the North-Western Provinces. It was, however, very unequally distributed in consequence of a large portion of the rainfall being cyclonic in character, and hence restricted to the belts of country across which the storms passed. The first period of rainfall during the month was from the 1st to the 6th. Oudh and the eastern and south-eastern districts received a heavy burst during the period.

The second period was from the 7th to the 11th, when the trans-Jumna districts—Banda, Hamirpur, Jhansi, Lalitpur and portions of Agra and Muttra—received excessive rain.

The third period of fairly general rain was from the 13th to the 18th. This rainfall was heaviest in the eastern districts, moderate in Oudh, and light in the western districts.

The fourth period was from the 23rd to the end of the month. The trans-Jumna and central and western districts of the North-Western Provinces, and the greater part of Oudh, obtained prolonged heavy rain during this period.

Rainfalls in 24 hours exceeding 5 inches were recorded during the month at 36 out of the 254 rainfall-registering stations in the province. The largest fall in 24 hours was 12·90 inches on the 7th at Garotha in the Jhansi district. The rainfall of the month was below the normal in the eastern districts of Gorakhpur, Ballia, Azamgarh, Jaunpur and Ghazipur. The following gives data for these districts:—

District.	Average total of district, September 1891.	Normal average rainfall, September.	Variation from normal.
	Inches.	Inches.	Inches.
Gorakhpur	4·98	8·22	—3·24
Ballia	2·41	4·14	—1·73
Azamgarh	4·92	7·80	—2·88
Ghazipur	4·33	6·63	—2·30
Jaunpur	5·94	7·60	—1·66

The rainfall was largely in excess in the Barabanki, Sitapur, Kheri and Hardoi districts of Oudh, and in the Jhansi, Lalitpur, Hamirpur, Banda, Agra, Mainpuri, Etawah, Cawnpore and Jalaun districts bordering on Rajputana and Central India and in Rohilkhand. The following give data for these districts of excessive rainfall:—

Province.	District.	Average rainfall of month, September 1891.	Normal average rainfall, September.	Variation from normal.
		Inches.	Inches.	Inches.
Oudh	Barabanki	14·08	6·68	+ 7·40
	Sitapur	16·03	6·56	+ 9·47
	Kheri	23·08	7·53	+15·55
	Hardoi	17·06	5·71	+11·35
North-Western Provinces	Jhansi	24·72	5·22	+19·50
	Lalitpur	22·04	5·46	+16·58
	Hamirpur	17·14	5·37	+11·77
	Banda	12·74	6·50	+ 6·24
	Jalaun	10·34	4·82	+ 5·52
	Agra	11·44	4·76	+ 6·68
	Etawah	10·20	5·67	+ 4·53
	Mainpuri	12·14	5·33	+ 6·81
	Pilibhit	19·73	8·20	+11·53
	Bareilly	18·32	7·40	+10·92

The rainfall of the month in these districts was hence from two to five times its normal amount and was in excess at all stations in these districts almost without exception. In the remaining districts the rainfall was above the normal, but it was in many districts very irregularly distributed. The following gives a few examples of this feature :—

District.	Station.	Actual maximum and minimum rainfall in district.	Normal.	Variation from normal.
		Inches.	Inches.	Inches.
Etah	Aliganj	17·85	7·44	+10·41
	Jalesar	3·30	5·49	—2·19
Aligarh	Khair	10·20	4·11	+6·09
	Iglás	1·50	3·82	—2·32
Bulandshahr	Bulandshahr	7·36	5·11	+2·25
	Anupshahr	0·80	5·82	—5·02
Budaun	Budaun	20·70	6·75	+13·95
	Gunnaur	4·70	4·85	—0·15
Moradabad	Bilhari	12·50	6·21	+6·29
	Hasanpur	2·70	5·88	—3·18

These are the most striking examples of the great irregularity of the rainfall in many districts of the North-Western Provinces, which received on the average of all stations in each district a moderate excess.

The following table gives average rainfall for the meteorological districts of the North-Western Provinces :—

District.	Rainfall.			Number of Rainy Days.		
	Actual.	Normal.	Variation.	Actual.	Normal.	Variation.
	Inches.	Inches.	Inches.			
Oudh (North)	12·84	6·77	+6·07	11·8	7·2	+4·6
Oudh (South)	8·94	6·16	+2·78	13·6	7·4	+6·2
N.-W. P. (North-East)	6·41	6·56	—0·15	9·2	8·0	+1·2
N.-W. P. (Central)	10·14	5·11	+5·03	14·4	6·4	+8·0
N.-W. P. (West)	10·28	4·31	+5·97	11·3	5·3	+6·0
N.-W. P. (Submontane)	9·69	6·22	+3·47	12·0	6·4	+5·6

The chief periods of rainfall in the Punjab were, firstly, from the 6th to 14th, when fairly general rain was received in the south-east and east districts, and, secondly, from the 22nd to the 25th, when rain was received in all districts. No large amounts were received in the plains. The month was unusually showery in the hill districts, and rain continued steadily until the 25th.

Over the greater part of the province the rainfall did not differ largely from the normal, and was generally in slight excess. The only districts in which the excess was moderately large were those bordering on North-East Rajputana, *viz.*, Gurgaon, Delhi and Karnal.

There was a considerable excess in the hill districts, where the average fall was nearly double the normal. The following gives the more noteworthy falls :—

District.	Station.	Rainfall.	
		Actual, September 1891.	Normal, September.
		Inches.	Inches.
Kangra	Dharmsala	21·47	13·17
	Palampur	17·14	10·36
Simla	Simla	11·60	6·25
Gurdaspur	Dalhousie	11·65	8·00

The following gives comparative rainfall data of the Punjab for the month:—

Division.	Rainfall.			Average actual number of rainy days.
	Actual.	Average.	Variation.	
Punjab: South	1·87	1·94	—0·07	3·4
Punjab: Central	4·06	3·54	+0·52	5·1
Punjab: Submontane	3·12	4·21	—1·09	4·2
Punjab: North-west	3·10	3·41	—0·31	4·1
Punjab: West	1·27	0·97	+0·30	1·8
Hill district	6·78	5·92	+0·86	10·5

Beluchistan received showers during the period from the 20th to the 25th. Kashmir also obtained some light showers during the same period.

The rainfall in Rajputana varied very largely in amount. The eastern districts came under the influence of the cyclonic storms of the month. Ulwar, Bhurtpore, Dholepore and Kerowlee received excessive rain on the 8th, 9th and 10th during the second storm of the month. The following gives some of the more remarkable rainfalls :—

State.	Station.	Heaviest fall in 24 hours.	Date.
Ulwar	Kathumar	6·60	8th
Bhurtpore	Bhusawar	10·30	9th
	Baina	9·70	9th
	Bhurtpore	9·65	9th
	Weir	9·66	9th
Dholpore	Bari	6·30	8th
	Kolari	6·50	9th
Kerowlee	Kerowlee	10·20	9th

These four Native Sates received an average of 6·98 inches from the 8th to the 10th. Ajmere had light showers and Jeypore moderately heavy rain during this period.

The eastern and central states received frequent local showers from the 16th to the end of the month. Dholepore and Bhurtpore obtained moderate general rain from the 26th to the 30th in connection with the last storm of the month. The largest amount recorded during that

storm in these states was at Srimathra in Dholepur, which received 3·2 inches on the 29th and 3·5 inches on the 30th.

The rainfall was very largely in excess in the eastern states. The following gives data for a few stations for which average rainfall data are available :—

STATE.	STATION.	Total rainfall, September 1891.	Average rainfall, September.
Jeypore	Bandikui	10·07	1·53
	Jeypore	6·79	2·98
Ulwar	Ulwar	8·04	4·94
Bhurtpore	Bhurtpore	14·54	4·25
Kerowlee	Kerowlee	18·80	4·52

The rainfall of the month of the Bhurtpore State averaged 13·0 inches, of Ulwar 14·6 inches, and of Kerowlee 12·8 inches. These amounts are probably from three to four times as large as the normal average rainfalls of the month of these states.

The rainfall of the month was more or less in defect on the western half of Rajputana. The following gives data for representative stations :—

STATE.	STATION.	Total rainfall, September 1891.	Normal rainfall, September.
Jeysalmere	Jeysalmere	0·15	0·56
Jodhpore	Jodhpore	0·46	1·90
Bikaneer	Bikaneer	0·71	1·13
Ajmere	Ajmere	1·20	3·08
Oodeypore	Oodeypore	1·90	8·80
Serohi	Erinpura	0·30	2·57
	Mount Abu	2·28	8·20

It was normal in amount in the central states of Kotah, Deoli and Tonk.

In Central India rain fell during each of the periods of general rainfall in the North-Western Provinces, and the eastern districts more especially received very heavy rainfall. The chief periods of rainfall in the eastern districts (*i.e.*, Rewah, Bundelkhand, Bhopal and Gwalior) were from the 2nd to 8th, when large amounts were registered at many stations, from the 13th to the 18th and from the 23rd to the 25th, when the rainfall was general but moderate in amount. The heaviest recorded rainfalls were the following :—

STATE.	STATION.	Rainfall.
Gwalior	Gwalior	12·45 inches on the 7th.
Bundelkhand	Chirkhari	9·59 ,, ,, 8th.
	Datia	6·50 ,, ,, 8th.
	Samthar	7·22 ,, ,, 8th.

The rainfall of the month was hence more or less largely in excess in all the eastern districts. The following gives data :—

STATE OR DISTRICT.	STATION.	Actual, September 1891.	Normal, September.	Variation from normal.
		Inches.	Inches.	
BHOPAL	Bhopal	10·80	8·79	+ 2·01
	Sehore	17·19	8·79	+ 8·40
GWALIOR	Gwalior	20·99	5·29	+ 15·70
REWAH	Rewah	15·19	6·92	+ 8·27
	Sutna	12·81	5·37	+ 7·44
BUNDELKHAND	Nagode	13·26	6·79	+ 6·47
	Maihar	18·91	4·84	+ 14·07
	Nowgong	17·02	6·39	+ 10·63

The total rainfall of the month was hence very largely in excess in the Eastern states of Central India, the excess being on the whole greatest in Bundelkhand. In the Western districts, including Indore, and the neighbouring states the rainfall differed little from the average, but generally in slight excess.

The month was one of almost daily rainfall in the Central Provinces, and in the majority of districts the average number of rainy days was more than double the normal number. The periods of heaviest rainfall were the 3rd and 4th, the 6th and 7th, the 12th to 15th, the 19th and the 24th to the end of the month. In the second period *viz.*, the 6th and 7th, the Narsinghpur districts received a very heavy downpour. The following gives data :—

DISTRICT.	STATION.	DATE. 6th.	DATE. 7th.	TOTAL.
		Inches.	Inches.	Inches.
Narsinghpur	Narsinghpur	9·25	16·02	25·27
	Gadarwara	6·75	12·25	19·00
	Mohpani	5·96	11·69	17·65

The neighbouring districts of Hoshangabad and Saugor also received heavy rain on these days, but the totals were less than nine inches at all stations in these districts.

The rainfall of the third period, 12th to the 15th, was heavy in the eastern and central districts, and moderate in the western districts. Amounts in 24 hours, exceeding six inches, were recorded at the following stations during this period :—

DISTRICT.	STATION.	Inches.	Date.
Sambalpur	Raigarh	7·68	12th
	Sarangarh	6·30	12th
Seoni	Lakhnadon	8·05	14th

Some heavy downpours were recorded during the last rainfall period of the month. The following were the most noteworthy :—

STATION.	Heaviest rainfall in 24 hours.	Date.
	Inches.	
Pachmarhi	9·64	28th
Tejgarh	9·00	29th

The rainfall during the passage of the last cyclonic storm gave a heavy and prolonged burst of rain, but there were very few heavy cyclonic downpours.

The rainfall of the month was more or less in excess in all districts. The Narsinghpur district was throughout the whole month the chief centre of the heaviest rainfall, and its meteorology during the month is a remarkable example of the tendency for local peculiarities to perpetuate themselves for more or less prolonged periods. The following data for the three rainfall registering stations in that district show fully the excessive character of the rainfall:—

Station.	Rainfall.			Number of Rainy Days.	
	Actual, September 1891.	Normal, September.	Variation.	Actual, September 1891.	Normal, September.
	Inches.	Inches.	Inches.		
Narsingpur	61·09	9·37	+51·72	23	10·2
Gadarwara	49·31	8·59	+40·72	21	9·9
Mohpani	54·65	8·49	+46·16	27	6·5
Average of District	55·02	8·82	+46·20	24	8·9

The excess was also very large in the neighbouring districts of Jubbulpore, Seoni, Saugor, Damoh and Hoshangabad, and was least in the district of Nimar.

The following gives comparative data for the province:—

Division.	Rainfall.			Number of Rainy Days.		
	Actual, September 1891.	Normal, September.	Variation.	Actual, September 1891.	Normal, September.	Variation.
	Inches.	Inches.	Inches.			
Central Provinces, East	16·56	7·62	+ 8·94	16·0	9·5	+ 6·5
Ditto, Central	27·15	7·97	+19·18	21·3	9·7	+11·6
Ditto, West	22·06	8·80	+13·28	18·0	9·5	+ 8·5

Hyderabad had frequent rain throughout the month. Heavy rain was received during the first and last weeks of the month, especially in the northern districts. The following gives the heaviest recorded downpours:—

Sirpur Tandur, 12·83 inches on the 27th.
Aurangabad, 9·65 " " 2nd.
Hingoli, 7·14 " " 25th.

The rainfall of the month was very considerably in excess in the northern and central districts. The following gives data for the chief stations in that area:—

District.	Station.	Actual, September 1891.	Normal, September.	Variation.
Sirpur Tandur	Sirpur Tandur	22·55	4·10	+18·15
Nandair	Hingoli	19·36	7·02	+12·34
Aurangabad	Aurangabad	14·73	7·44	+ 7·29
	Jalna	14·01	7·25	+ 6·76
Nandair	Nandair	13·86	7·13	+ 6·73
Indur	Indur	13·10	6·91	+ 6·19

Over the remainder of the state the rainfall was normal or in moderate defect.

The month was exceptionally dry in Mysore. The western districts of Shimoga, Kadur and Hussein in Mysore received light showers during the first week of the month, and also on the 26th and 27th. In the western and southern districts, practically no rain fell during the month, except on the 30th, when light to moderate showers were received.

The rainfall of the month was hence very largely in defect. The following gives data for the month:—

District.	Rainfall.			Number of Rainy Days.	
	Average actual.	Average normal.	Variation	Average actual.	Average normal.
	Inches.	Inches.	Inches.		
Bangalore	0·42	5·39	—4·97	2·1	7·7
Kolar	1·35	5·10	—3·75	3·1	6·7
Tumkur	1·33	4·75	—3·42	3·0	6·4
Mysore	1·08	4·06	—2·98	2·3	5·8
Shimoga	2·75	5·88	—3·13	7·3	10·2
Kadur	2·54	5·85	—3·31	8·5	10·9
Hussein	1·26	3·83	—2·57	3·8	7·4
Chittaldroog	0·36	4·33	—3·97	1·8	6·7

The Konkan received almost daily rain during the month. The rainfall was very heavy during the first five days of the month. There was a fairly well-marked break from the 21st to the 23rd. The total rainfall of the month was in slight defect in North Canara, but was more or less in excess in the remaining districts of the Konkan. Guzerat and Kathiawar had frequent showers during the month. The chief periods of rain were the 1st to 4th, the 19th to 21st and the 25th to 28th. The rainfall varied somewhat irregularly from place to place, but was in slight defect in both divisions.

The rainfall was more or less considerably in defect over the whole of the Bombay, Deccan and Khandeish. The only period of fairly general rainfall in the whole of that area was from the 1st to the 4th. The Deccan received occasional local showers during the remainder of the month, the 25th to 28th being the period when they were most frequent. Nasik and Khandeish obtained general rain during the same periods as Guzerat. The driest districts during the month were Dharwar, Belgaum, Kohlapur, and the greater part of Bijapur and Satara. The following gives data for these five districts:—

District	Rainfall.		
	Actual average total rainfall of September 1891.	Normal average total rainfall of September.	Variation from normal.
Dharwar	0·63	3·97	—3·34
Bijapur	2·96	5·58	—2·62
Belgaum	0·94	4·62	—3·68
Kolhapur	0·52	3·37	—2·85
Satara	1·55	?	?

The deficiency in these districts was hence as large relatively to the normal as in the adjacent districts of Bellary, and Anantapur in Madras, and Raichur and Lingsugur in the Hyderabad state.

The following gives rainfall data for the Presidency for the month based on the rainfall statement of the month published in the Provincial Gazette:—

Meteorological Division.	Rainfall.			Average Number of Rainy Days.		
	Actual of district.	Normal of district.	Variation from normal.	Actual of district.	Normal of district.	Variation from normal.
	Inches.	Inches.	Inches.			
Konkan	17·92	14·80	+3·12	20·0	16·8	+3·2
Carnatic	1·22	2·11	−0·89	3·0	7·8	−4·8
South Deccan	3·93	5·79	−1·86	5·7	9·2	−3·5
North Deccan or Khandesh	5·50	6·69	−1·19	7·5	9·2	−1·7
Guzerat	7·49	8·24	−0·75	8·8	8·3	+0·5
Guzerat, Kathiawar and South States.	4·34	4·43	−0·09	5·5	4·4	+1·1
Sind	0·42	?	?	1·1	?	?

The rainfall of the month of September was very scanty over the greater part of Madras. The districts of Ganjam and Vizagapatam received frequent moderate to heavy rain throughout the month, in connection with the cyclonic storms that passed from the Bay into Central and Northern India. The districts of Godavari and Kistna also shared in the general rainfall due to these storms and received slightly larger amounts than usual. In the East coast districts from Kurnool and Nellore to Tanjore and Trichinopoly, light occasional showers were received during the periods 15th to 18th and on the 21st and 22nd, and general rain from the 27th to the end of the month. The districts of Madura and Tinnevelly had only a few local showers during the month, and the local rainfall was very small in amount. The central districts of Coimbatore, Salem and Cuddapah received some light local showers of no importance prior to the 28th, and moderate but fairly general rain on the 29th and 30th. A large part of the districts of Anantapur and Bellary was almost rainless throughout the month. Seven out of twenty-two stations in these two districts reported total rainfalls of a tenth of an inch or less during the month. Malabar received frequent showers during the month, but they were unusually light, and the total rainfall was very considerably in defect in the area.

The following statement gives a complete statement of the rainfall of the Madras Presidency for the month of September, prepared from the monthly statement published by the Madras Government:—

Meteorological Division.	District.	Rainfall.			Number of Rainy Days.		
		Average actual.	Average normal.	Variation from normal.	Average actual.	Average normal.	Variation.
		Ins.	Ins.	Ins.			
East coast, North	Ganjam	6·95	7·28	−0·33	12·4	9·9	+2·5
	Vizagapatam	6·39	7·38	−0·99	11·9	9·9	+2·0
	Godavari	7·04	5·57	+1·47	8·6	8·2	+0·4
	Kistna	6·26	5·79	+0·47	8·7	8·0	+0·7
Do., Central	Nellore	3·22	3·61	−0·39	5·4	5·5	−0·1
Do., South	Chingleput	2·44	4·93	−2·49	5·0	6·4	−1·4
	North Arcot	4·27	5·37	−1·10	5·9	6·7	−0·8
	South Arcot	3·79	5·23	−1·44	4·7	6·7	−2·0
	Tanjore	1·30	4·28	−2·98	2·5	5·8	−3·3
	Trichinopoly	2·69	4·19	−1·50	4·0	5·9	−1·9
Madras, South	Madura	1·03	2·92	−1·89	1·9	4·8	−2·9
	Tinnevelly	0·87	1·13	−0·26	1·2	2·3	−1·1
Malabar coast	Malabar	2·39	9·12	−6·73	7·1	13·5	−6·4
	South Canara	8·90	11·72	−2·82	15·9	15·6	+0·3
Madras, South Central.	Salem	3·62	5·61	−1·99	5·0	7·6	−2·6
	Coimbatore	0·86	2·92	−2·06	1·7	4·8	−3·1
Madras hills	Nilgiris	2·09	8·51	−6·42	5·5	13·7	−8·2
Do. Central	Cuddapah	2·76	5·14	−2·38	4·5	6·7	−2·2
	Anantapur	0·29	5·46	−5·17	1·1	7·2	−6·1
	Bellary	1·06	5·13	−4·07	2·8	7·7	−4·9
	Kurnool	1·86	5·71	−3·85	4·9	7·2	−2·3

Explanation of Tables.

Table I gives an abstract of the meteorological observations at 8 A.M., daily, taken at 158 stations in India during the month of September 1891.

In this Table the observing stations are grouped under two sets of divisions. According to the first arrangement India and Burma are divided into eleven large meteorological areas or provinces. These divisions have been selected in consultation with the Medical Department. The climatic conditions of each area are fairly uniform, and they hence are presumed to form suitable areas for the discussion of the relations between disease and meteorology. The names of these divisions are printed in bold type, and the mean variations of the more important meteorological data, more especially temperature, are given opposite to each in prominent figures.

Each of these larger divisions is sub-divided into smaller meteorological areas or districts, of which there are 51 in all. This sub-division was made in consultation with the Revenue and Financial Departments. In each of these smaller areas the distribution and character of the rainfall are fairly uniform, and the staple crops in each are hence the same. This sub-division will, it is hoped, enable a more exact comparison to be made between crops and rainfall than has been hitherto possible.

The headings of the columns in the great majority of cases explain themselves. The figures in the third column

"Variation from normal" are obtained by taking in each case the difference between the mean actual barometer (reduced for temperature, but not to sea-level or constant gravity) and the normal means obtained from the observations of the eleven years' period 1878—88.

The "Mean daily temperature" is assumed in Table I to be the mean of the maximum and minimum. It is chiefly utilized in order to obtain the mean variation of the temperature of the month from the normal.

In obtaining the figures for the column headed "Number of rainy days," a rainy day is assumed to be one on which a fall of a tenth of an inch or upwards has been recorded. A fall of less than a tenth of an inch is practically of no value for agricultural purposes in India, and it has not been found possible to secure the accurate record of rainfalls of less than a tenth of an inch at a great majority of the rainfall-recording stations.

Table II gives an abstract of the observations recorded at 10 A.M. and 4 P.M. at 89 second class observatories throughout India, Burma and the adjacent regions. This Table is intended in part to supplement Table I, and hence information given in full in the latter Table, as, for example, rainfall, is not included in Table II. This Table is intended to give for the month, so far as is possible, all the information furnished hitherto in the Appendix A of the Annual Report on the Meteorology of India. The methods of calculating the means have been very fully explained in the Annual Reports, to which the reader is referred for complete information. The data of the mean daily pressure, the figures of which are given in the sixth column, are the means of the 10 and 16 hours' observations, with corrections obtained from a comparison of the 10 and 16 hours' observation of the same or a neighbouring observatory, with a series of hourly observations at the same observatory.

The mean temperature is calculated by the formula $\text{mean} = \frac{\text{maximum} + \text{16 hours} + \text{2 minimum}}{4}$ by applying a constant correction for each month, derived from the hourly observations of the same or of a neighbouring station.

The mean daily vapour tension and humidity are the averages of the values for 10 A.M., 4 P.M., and the minimum readings, and the mean daily cloud is the average of the mean amounts for 10 and 16 hours.

The mean wind directions for each month are the trigonometrical resultants of the winds given under each of the eight cardinal points, and are calculated by means of Lambert's formula, in which an equal weight or value is given to every wind.

It should be noted that in the preceding discussion, in speaking of the maximum, minimum, or mean temperature, the total amount of wind or the rainfall of a given day, as, for example, the 5th, the maximum, &c., of the 24 hours preceding 8 A.M of the 5th, is meant. This definition has been adopted to avoid confusion. As the observations are taken at 8 A.M., a part of them refer to 8 A.M. of that day and a part to the previous 24 hours, and, therefore, including a portion of the previous civil day. It is found most convenient to use the same date to designate and define both classes of observations.

Table

Abstract of Observations taken at 8 A.M., at 160 Stations

Meteorological Province or District.	Station.	Height of Station in feet.	Pressure, 8 A.M., in inches. 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.	Temperature of Air. 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.
Burma Coast and Bay Islands.		...	...	+·004		...	...	...	...	...	...	84·5	−0·6	74·8	−0·5	79·7	−0·6	9·7	...	...	...	...	16·3
Bay Islands	Port Blair	61·16	29·833	?	29·825	25·919	26th	29·767	17th	·152	80·5	84·8	?	77·3	?	81·0	?	7·5	88·8	28th	74·5	7th	14·3
	Nancowry	?	29·926	?	?	29·991	14th	29·850	18th & 19th.	·141	80·6	85·0	?	77·0	?	81·0	?	8·0	87·5	12th	74·0	16th	13·5
Tenasserim	Mergui	96·27	29·809	?	29·837	29·903	25th	29·717	19th	·186	76·2	81·7	?	68·2	?	75·0	?	13·5	86·2	2nd	66·4	14th	19·8
	Tavoy	26·26	29·898	?	29·858	30·001	26th	29·798	19th	·203	76·3	82·0	?	73·8	?	77·9	?	8·2	86·2	4 days	71·2	16th	15·0
	Moulmein	93·79	29·789	+·009	29·823	29·909	26th	29·656	19th	·253	77·3	83·4	−1·1	74·7	+0·7	79·0	−0·2	8·7	87·5	28th & 30th.	72·3	1st & 2nd.	15·2
	Toungoo	181·1	29·663	−·001	29·789	29·774	26th	29·582	19th	·192	78·3	88·5	0	75·3	−0·1	81·9	−0·1	13·2	93·2	20th	73·2	11th & 12th.	20·0
Lower Burma	Rangoon	40·69	29·820	−·006	29·799	29·948	25th	29·722	19th	·226	77·6	85·1	−0·4	75·2	−0·8	80·3	−0·6	9·9	89·7	29th	72·9	16th	16·8
	Bassein	21	29·840	+·010	29·799	29·953	25th	29·737	9th	·216	78·5	84·9	−0·4	75·0	−0·6	79·9	−0·5	9·9	89·7	30th	73·4	4 days	16·3
	Diamond Island	41	29·826	+·009	29·804	29·936	25th	29·714	9th	·222	79·8	84·0	−0·9	71·7	−4·0	77·9	−2·5	12·3	88·3	13th	68·6	16th & 17th.	19·7
Arakan	Akyab	20·44	29·806	+·003	29·771	29·940	26th	29·688	10th	·252	80·2	85·6	−1·0	79·5	+1·6	82·6	+0·3	6·1	89·2	10th	77·1	2nd	12·1
Burma, Inland		...	...	+·005	...		...	...	...	...	...	91·7	−0·5	74·2	−2·8	82·	−1·7	16·5	...	...	...	...	23·8
Central Burma	Thayetmyo	134	29·702	+·005	29·780	29·818	25th	29·625	8th	·193	81·4	89·2	−0·5	72·9	−2·8	81·1	−1·7	16·3	84·7	20th	71·0	20th	23·7
Upper Burma	Mandalay	?	29·580	?	?	29·650	25th	29·493	16th	·157	82·5	94·5	?	?	?	?	?	?	99·5	21st	?	?	?
	Kindat	?	29·440	?	?	29·554	28th	29·342	1st	·212	80·3	91·4	?	75·0	?	83·2	?	16·4	95·8	21st	73·0	8th & 9th.	22·8
	Bhamo	?	29·416	?	?	29·517	25th	29·318	1st	·199	79·9	91·6	?	74·8	?	83·2	?	16·8	97·1	22nd	72·1	9th & 30th.	25·0
Assam		...	...	−·006	...	...	...	...	...	...	...	89·9	+1·8	77·3	+0·7	83·6	+1·2	12·6	...	...	...	...	21·3
Assam (Surma)	Silchar	104·3	29·697	0	29·752	29·803	26th	29·588	16th	·215	80·4	91·5	+1·9	76·4	+0·1	84·0	+1·0	15·1	99·6	21st	74·3	28th & 30th.	25·3
Brahmaputra	Sibsagar	333	29·461	−·016	29·749	29·551	25th	29·377	11th	·174	80·0	89·9	+0·9	77·3	+0·8	83·6	+0·9	12·6	95·1	24th	74·0	30th	21·1
	Dhubri	115·34	29·672	−·002	29·741	29·786	25th	29·574	1st & 6th.	·212	80·5	88·2	+2·5	78·1	+1·1	83·2	+1·8	10·1	92·2	7th	74·8	28th	17·4
Bengal and Orissa		...	...	−·001	...	...	...	...	...	...		87·9	+0·4	77·5	+0·1	82·7	+0·3	10·4	...	...	...	...	17·7
East Bengal	Chittagong	86·7	29·714	−·004	29·748	29·843	28th	29·606	10th	·237	81·9	87·6	+1·1	75·9	−0·2	81·8	+0·5	11·7	91·7	10th & 21st.	74·1	14th	17·6
	Lungleh	?	?	?	?	?	?	?	?	?	69·4	70·3	?	66·0	?	68·2	?	4·3	72·9	11th, 21st & 25th.	64·4	4 days.	8·5
	Noakhali	42·73	29·749	?	29·739	29·876	27th	29·643	5th	·233	81·4	86·9	?	77·6	?	82·3	?	9·3	91·5	11th & 21st.	74·8	21st	16·7
	Comilla	34·75	29·764	?	29·747	29·913	29th	29·644	10th	·269	80·7	89·2	?	76·5	?	82·7	?	12·7	93·3	11th & 21st.	73·8	21st	19·5
	Sirajganj	46·37	29·728	?	29·724	29·844	26th	29·619	6th	·225	81·5	88·8	?	77·8	?	83·4	?	11·0	93·6	21st & 22nd	74·7	6th, 22nd & 28th.	18·9
	Dacca	21·7	29·756	+·007	29·726	29·877	26th	29·640	5th	·237	81·8	89·5	+1·0	78·3	−0·4	83·9	+0·3	11·2	93·1	21st	74·2	22nd & 23rd.	18·9
	Bárisal	12	29·756	+·002	29·713	29·887	26th	29·609	5th	·278	82·5	87·8	+1·8	77·9	+0·4	82·9	+1·1	9·9	92·3	21st	74·9	21st & 27th.	17·4
	Mymensingh	55·18	29·731	+·011	29·740	29·838	26th	29·632	10th & 16th.	·206	80·9	88·2	+1·4	77·8	+0·8	83·1	+1·1	10·4	93·2	21st & 22nd	74·6	23rd	18·6
Deltaic Bengal	Faridpur	39	29·745	?	29·732	29·869	28th	29·626	5th	·243	82·1	87·9	?	78·4	?	83·2	?	9·5	92·0	21st	76·4	22nd & 24th.	15·6
	Jessore	33·29	29·726	−·008	29·706	29·852	28th	29·582	6th	·270	82·4	88·7	−0·4	78·4	0	83·5	−0·2	10·3	93·7	21st	74·9	27th	18·8
	Calcutta	21·38	29·725	−·004	29·692	29·855	28th	29·567	6th	·288	81·3	86·9	−0·5	77·9	0	82·4	−0·3	9·0	91·1	16th	74·2	21st	16·9
	Saugor Island	25·3	29·710	−·014	29·679	29·850	30th	29·525	6th	·325	81·7	87·3	−0·5	78·7	−0·7	83·1	−0·6	8·6	90·2	16th	75·5	21st	14·7
	Krishnagar	46·64	29·703	?	29·699	29·821	28th	29·562	6th	·259	82·2	89·8	?	78·0	?	83·9	?	11·8	94·3	21st	75·2	21st & 27th.	19·1
	Midnapore	148·88	29·591	?	29·686	29·713	28th	29·424	6th	·289	81·4	88·8	?	77·4	?	83·1	?	11·4	93·3	1 th & 21st,	74·1	21st.	19·2
Central Bengal	Bankura	300	29·419	?	29·669	29·547	30th	29·268	6th	·279	80·6	88·4	?	77·7	?	83·0	?	10·7	93·1	21st	75·6	25th, 26th & 29th.	17·5
	Raniganj	345·15	29·411*	?	29·705*	29·536	30th	29·286	6th	·250	80·8*	89·4*	?	77·7*	?	83·6*	?	11·7	92·5	2nd & 21st.	74·9	27th	17·6
	Burdwan	99·09	29·659	+·002	29·705	29·767	28th	29·516	6th	·251	81·7	89·5	0	78·6	−0·1	84·0	−0·1	10·9	93·1	21st	76·4	27th & 28th.	16·7

* Mean of 26 days.

I.

in India, Burma, &c., in September 1891.

Wind Direction. Number of Winds from: Calm.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	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.	Normal rainfall for period, 1st June to 30th September.	Variation from normal of period from 1st June to 30th September.	Station.	Meteorological Province or District.
...	...	...	...	...	...	...	...	...	...	...	.	...	...	...	...	...	...	24·37	20·91	+5·32	...	...	...	**Burma Coast and Bay Islands.**	
3	...	...	...	...	...	12	14	(a) 1	13*	9	+44	89	·929	7·7	20	...	...	13·75	19·56	− 5·81	65·95	69·53	− 3·58	Port Blair .	Bay Islands.
5	...	...	...	...	8	10	1	...	4	9	−56	84	·876	8·5	15	...	...	7·54	?	?	?	?	?	Nancowry.	
...	...	...	...	...	1	7	2	20	2	2	0	93	·842	9·8	26	...	...	37·83	26·24	+11·59	139·15	118·52	+20·63	Mergui .	Tenasserim.
21	1	...	...	...	2	5	1	...	1	?	?	94	·857	8·3	27	...	...	43·41	32·84	+10·57	196·16	162·30	+33·86	Tavoy.	
1	1	3	3	6	9	1	5	1	3	3	0	94	·881	6·2	27	...	...	34·65	26·73	+ 7·92	186·38	151·19	+35·19	Moulmein.	
1	2	...	2	14	10	...	...	1	4	3	+33	92	·903	9·3	17	...	...	10·31	12·05	− 1·74	46·78	65·76	−18·98	Toungoo.	
...	2	...	...	1	3	11	12	1	3	4	−25	95	·906	9·0	23	...	...	22·75	15·74	+ 7·01	96·34	74·39	+21·95	Rangoon .	Lower Burma.
5	1	1	..	7	2	6	4	4	5	3	+67	93	·908	7·4	23	...	...	22·79	15·68	+ 7·11	124·35	85·43	+38·92	Bassein.	
2	2	...	...	...	3	9	10	4	6	7	−14	88	·889	8·4	21	...	...	23·92	19·31	+ 4·61	120·31	90·75	+29·56	Diamond Island.	
...	5	4	7	6	4	1	2	1	3	3	0	92	·951	8·2	21	...	...	26·74	20·08	+ 6·66	177·83	156·60	+21·23	Akyab .	Arakan.
...	...	...	.	...	...	...	...	...	...	...	...	...	...	...	..	...	...	6·81	9·60	−2·79	...	...	...	**Burma, Inland.**	
...	2	...	1	7	19	...	1	...	7	5	+40	85	·876	7·7	16	...	...	8·10	6·38	+ 1·72	28·02	27·70	+ 0·32	Thayetmyo	Central Burma.
3	...	...	...	...	27	...	...	...	...	?	?	84	·927	6·7	11	...	...	6·44	6·33	+ 0·11	11·74	21·88	−10·14	Mandalay .	Upper Burma.
21	1	5	...	...	...	...	...	3	4	?	?	92	·954	1·9	10	...	...	6·14	14·79	− 8·65	46·50	54·63	− 8·13	Kindat.	
...	...	12	...	2	...	7	..	9	...	?	?	87	·890	6·2	8	...	...	6·57	10·89	− 4·32	50·86	61·84	−10·98	Bhamo.	
..	...	...	...	...	...	..	...	...	...	...	...	...	...	...	...	...	...	9·41	13·44	−4·03	...	...	...	**Assam.**	
28	...	...	1	...	1	...	...	...	1	3	−67	91	·938	8·7	16	...	...	12·61	15·09	− 2·48	69·16	74·86	− 5·70	Silchar .	Assam (Surma).
1	1	7	4	5	...	10	2	...	2	2	0	93	·952	8·5	15	...	...	10·74	12·64	− 1·90	55·49	55·37	+ 0·12	Sibsagar .	Brahmaputra.
5	...	5	5	1	3	9	1	1	4	3	+25	89	·928	6·7	6	...	...	4·87	12·59	− 7·72	48·47	61·43	− 12·96	Dhubri.	
...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	8·99	11·34	−2·96	...	...	...	**Bengal and Orissa.**	
3	...	...	6	16	5	...	...	...	4	5	−25	85	·928	8·0	9	...	...	4·27	12·09	− 7·82	54·17	74·47	−20·30	Chittagong	East Bengal.
...	...	...	...	...	...	...	...	...	?	?	?	94	·678	?	24	...	...	23·52	?	?	92·55	?	?	Lungleh.	
2	1	1	10	13	...	1	1	1	8	?	?	88	?	2·4	14	...	...	7·80	16·38	− 8·58	56·18	84·63	−28·45	Noakhali.	
1	1	...	1	13	8	5	1	...	3	?	?	88	?	4·5	9	...	...	7·40	11·37	− 3·97	36·81	63·96	−27·15	Comilla.	
...	...	3	9	11	5	2	...	...	3	?	?	92	?	6·7	8	...	...	4·72	?	?	33·96	?	?	Sirajganj.	
1	2	...	9	10	4	2	1	1	6	5	+20	88	·953	7·5	7	...	...	5·97	9·28	− 3·31	43·93	46·47	− 2·54	Dacca.	
9	1	...	2	10	5	2	...	1	4	?	?	87	·968	6·9	17	...	...	11·41	12·37	− 0·96	41·40	56·99	−15·59	Bárisal.	
...	3	2	9	10	5	1	...	...	4	?	?	90	·949	6·8	9	...	...	4·30	13·95	− 9·65	40·54	60·94	−20·40	Mymensingh.	
2	1	1	4	13	7	...	2	...	4	?	?	89	?	5·6	7	...	...	4·82	9·58	− 4·76	36·79	47·57	−10·78	Faridpur .	Deltaic Bengal.
5	...	...	3	14	7	...	...	1	4	3	+33	89	·993	7·9	14	...	...	6·09	9·37	− 3·28	33·59	45·12	−11·53	Jessore.	
1	1	2	13	7	3	3	...	...	5	4	+25	90	·957	7·8	19	...	...	9·25	9·93	− 0·68	36·74	46·44	− 9·70	Calcutta.	
...	1	5	7	4	9	3	...	1	12	10	+20	90	·971	8·2	19	...	...	14·33	13·05	+ 1·28	65·35	57·44	+ 7·91	Saugor Island.	
...	...	3	9	10	4	1	1	2	6	?	?	86	?	6·9	8	...	...	3·84	7·74	− 3·90	28·88	38·57	− 9·69	Krishnagar.	
2	2	10	1	8	5	2	...	...	9	?	?	88	?	3·7	16	...	...	10·44	8·15	+ 2·29	46·86	42·74	+ 4·12	Midnapore.	
8	...	2	14	3	3	...	...	...	4	?	?	91	?	6·9	12	...	...	5·56	8·50	− 2·94	34·62	43·27	− 8·65	Bankura .	Central Bengal.
...	...	5	13	6	3	2	...	(b) ...	3*	?	?	88*	?	3·4	14	...	...	4·55	?	?	33·16	?	?	Raniganj.	
...	1	1	10	9	5	4	...	...		3	+33	84	·911	7·6	6	...	...	1·82	8·51	− 6·69	34·21	41·62	− 7·41	Burdwan.	

* Mean of 29 days.

(a) Wind observations for 24 days only. (b) Wind observations for 29 days only.

Table

Abstract of Observations taken at 8 A.M., at 160 Stations

Meteorological Province or District.	Station.	Height of Station 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.
Central Bengal —*contd.*	Naya Dumka	490	29·254	?	29·699	29·347	19th	29·124	6th	·223	81·3	88·5	?	76·8	?	82·7	?	11·7	92·6	21st & 22nd.	73·3	22nd	19·3
	Berhampore	66·45	29·688	−·003	29·704	29·796	28th	29·568	6th	·228	81·0	89·7	+0·9	78·2	−0·2	84·0	+0·4	11·5	94·2	21st	75·2	22nd	19·0
	Rampur Boalia.	70	29·690	?	29·712	29·797	26th	29·574	6th	·223	82·1	88·4	?	78·7	?	83·4	?	9·7	92·8	22nd	75·6	22nd & 27th.	17·2
	Malda	80	29·678	?	29·709	29·781	25th	29·564	6th	·217	83·6	91·3	?	78·6	?	85·0	?	12·7	95·6	11th	75·7	22nd	19·9
	Bogra	61·48	29·697	+·027	29·711	29·804	25th	29·592	6th	·212	82·3	89·8	+2·0	78·0	+0·8	84·0	+1·4	11·8	93·8	11th & 21st.	73·7	17th	20·1
North Bengal	Dinajpur	117·59	29·649	−·004	29·720	29·762	25th	29·548	1st	·214	82·6	90·3	+2·1	78·6	+1·1	84·4	+1·6	11·7	95·1	21st & 22nd.	75·2	17th & 24th.	19·9
	Rangpur	123	29·667	?	29·744	29·783	25th	29·565	6th	·218	81·8	90·3	?	77·6	?	84·0	?	12·7	95·3	22nd	73·2	17th	22·1
	Jalpaiguri	283·7	29·492	+·011	29·728	29·583	25th	29·396	16th	·187	81·5	89·3	+2·1	76·6	+1·4	82·9	+1·8	12·7	93·4	3 days	74·1	30th	19·3
Orissa	Balasore	53·98	29·671	−·015	29·672	29·817	28th	29·484	6th	·333	81·0	86·5	−1·0	77·3	+0·7	81·9	−0·2	9·2	91·4	16th & 17th.	74·8	4 days	16·6
	False Point	20·60	29·717	−·012	29·680	29·863	28th	29·543	6th	·320	82·0	86·4	−1·5	77·4	−0·7	81·9	−1·1	9·0	89·5	10th & 17th.	73·6	12th	15·9
	Cuttack	80	29·653	−·006	29·675	29·799	29th	29·472	6th	·327	81·8	88·0	−1·9	77·2	−0·7	82·6	−1·3	10·8	92·4	5 days	74·8	3 days	17·6
	Shortt's Island	?	29·690	?	?	29·861	28th	29·526	17th	·335	82·1	86·3*	?	78·6*	?	82·4*	?	7·7	90·0	15th	73·4	26th	16·6
	Puri	11·99	29·706	?	29·655	29·854	28th	29·545	6th	·309	82·0	86·9	?	79·5	?	83·2	?	7·4	91·7	29th	76·6	22nd	15·1
Gangetic Plain and Chota-Nagpur.		...	...	−·010	...	...	...	...	...	...		89·8	+0·2	77·4	+0·4	83·7	+0·3	12·4	...	...	...	...	20·2
Chota-Nagpur	Hazaribagh	2,007·12	27·733	−·013	29·682	27·845	20th	27·599	6th	·246	75·5	84·1	−0·3	72·1	0	78·1	−0·2	12·0	88·7	12th	68·3	29th	20·4
	Ranchi	2,128·14	27·607	?	29·671	27·720	20th	27·461	6th	·259	74·7	81·9	?	71·2	?	76·7	?	10·7	86·0	22nd	67·4	29th & 30th.	18·6
	Chaibassa	760	28·952	−·011	29·660	29·061	30th	28·772	6th	·289	78·8	88·0	−0·7	76·1	+0·5	82·1	−0·1	11·9	91·4	15th & 16th.	72·7	29th & 30th.	18·7
Bihar, South	Gaya	374·5	29·339	−·022	29·666	29·436	20th	29·229	6th	·207	81·8	91·4	+0·6	78·5	+0·6	85·0	+0·6	12·9	95·0	22nd	75·3	30th	19·7
	Dehri	351·14	29·360	?	29·663	29·452	21st	29·246	6th	·206	82·7	90·1	?	78·2	?	84·1	?	11·9	97·3	22nd	76·0	29th & 30th.	21·3
	Patna	182·84	29·552	−·012	29·686	29·661	19th	29·447	6th	·214	83·9	91·6	+1·2	79·9	+0·7	85·7	+1·0	11·7	94·9	12th	76·2	30th	18·7
	Arrah	190·02	29·534	?	29·675	29·642	20th	29·419	6th	·223	83·3	91·5	?	78·6	?	85·0	?	12·9	97·4	14th	74·6	30th	22·8
	Buxar	239·22	29·486	?	29·678	29·594	20th	29·381	6th	·213	82·9	90·1	?	77·8	?	84·0	?	12·3	93·4	21st	73·3	23rd	20·1
Bihar, North	Purnea	125	29·639	+·012	29·717	29·757	28th	29·533	1st	·224	82·7	91·1	+1·9	76·9	−0·4	84·0	+0·8	14·2	94·7	22nd	73·7	17th	21·0
	Bhagalpur	159·78	29·585	?	29·697	29·685	19th	29·466	6th	·219	83·3	90·5	?	78·3†	?	84·6†	?	12·2	94·7	22nd	75·5	30th	19·2
	Darbhanga	166·32	29·593	+·008	29·712	29·695	19th	29·495	6th	·200	83·1	91·1	+2·9	78·7	−0·2	84·9	+1·4	12·4	95·9	22nd	76·0	24th & 25th.	19·9
	Muzaffarpur	178·42	29·553	?	29·684	29·656	19th	29·447	6th	·209	82·5	90·7	?	79·2	?	85·0	?	11·5	95·3	22nd	74·2	23rd	21·1
	Motihari	223·61	29·519	?	29·699	29·620	19th	29·425	6th	·195	83·2	91·9	?	78·2	?	85·1	?	13·7	96·2	22nd & 23rd	74·9	30th	21·3
	Chapra	181·3	29·553	?	29·687	29·660	20th	29·446	6th	·214	83·3	91·5	?	78·4	?	84·9	?	13·1	95·3	12th	76·1	17th & 24th.	19·2
N.-W. Provinces (Eastern Districts).	Benares	266·97	29·448	−·013	29·672	29·567	20th	29·333	7th	·234	81·5	90·1	−1·1	78·1	+0·6	84·2	−0·3	12·0	93·8	21st	74·0	23rd	19·8
	Allahabad	309·28	29·390	−·033	29·655	29·506	20th	29·266	8th	·240	82·3	90·5	−0·3	77·7	+0·9	84·1	+0·3	12·8	94·9	23rd	73·6	17th & 30th.	21·3
N.-W. Provinces (Eastern Sub-montane).	Gorakhpur	255·93	29·478	+·001	29·694	29·582	20th	29·385	6th	·197	82·8	90·7	0	78·6	+0·6	84·6	+0·3	12·1	95·4	23rd	76·2	5 days	19·2
Oudh, South	Lucknow	369·4	29·343	−·021	29·673	29·465	21st	29·218	4th	·247	81·6	90·1	−1·8	77·1	+0·7	83·6	−0·6	13·0	94·8	21st	73·3	30th	21·5
N.-W. Provinces (Central).	Cawnpore	415·57	29·281	?	29·655	29·406	20th & 21st	29·165	8th	·241	81·9	89·8	?	77·6‡	?	83·7‡	?	12·2	93·5	2 days	74·1	2 days	19·4
Upper—Sub-Himalayas		...	..	+·007	...	...	...	...	...	...	...	90·9	−1·6	75·0	+1·5	83·0	−0·1	15·9	...	...	...	...	27·0
N.-W. Provinces (Sub-montane).	Bareilly	568·47	29·152	+·004	29·689	29·271	20th	29·035	16th	·236	79·9	86·6	−3·9	76·0	+0·1	81·3	−1·9	10·6	92·3	13th & 21st	71·6	22nd	20·7
	Dehra Dun	2,232·4	27·547	?	29·736	27·664	20th	27·434	16th	·230	74·0	83·6	?	71·0	?	77·3	?	12·6	87·5	1st	67·0	4th	20·5
	Roorkee	886·63	28·854	+·017	29·714	28·971	24th	28·735	16th	·236	79·1	89·6	−1·7	75·4	+1·7	82·5	0	14·2	95·7	21st	71·0	6th	24·7
	Meerut	737·48	29·000	+·020	29·706	29·120	24th	28·889	1st	·231	80·3	88·8	−2·9	75·5	+0·7	82·2	−1·1	13·3	92·8	21st	70·5	27th	22·3
Punjab (Central).	Delhi	717·81	29·014	+·007	29·699	29·123	20th	28·890	1st	·233	80·6	88·4	−4·5	77·5	+0·8	82·9	−1·9	10·9	92·5	2nd	72·6	28th	19·9
	Lahore	702·2	29·014	+·010	29·686	29·128	20th	28·885	1st	·243	83·6	98·2	+1·2	76·5	+2·7	87·4	+2·0	21·7	103·8	10th	69·9	24th	33·9

* Mean of 20 days. † Mean of 28 days. ‡ Mean of 29 days.

I—*continued.*

in India, Burma, &c., in September 1891—continued.

Wind Direction. Number of Winds from: Calm.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	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 1891.	Normal rainfall for period, 1st June to 30th September.	Variation from normal of period from 1st June to 30th September.	Station.	Meteorological Province or District.
2	...	1	12	7	5	2	...	1*	5	?	?	84	?	3·2	13	...	...	4·33	10·19	— 5·86	34·35	46·58	—12·23	Naya Dumka	Central Bengal.—*contd.*
...	...	1	16	3	8	1	...	...	4	4	0	91	·964	7·8	11	...	..	6·65	10·30	— 3·65	25·92	41·30	—15·38	Berhampur.	
...	...	3	9	11	4	2	..	1	5	?	?	89	?	5·2	9	...	...	2·72	10·88	— 8·16	34·45	43·51	— 9·06	Rampore Boalia.	
1	...	4	13	11	1	...	...	...	3	?	?	85	?	3·5	8	...	...	5·63	11·06	— 5·43	27·42	41·72	—14·30	Malda.	
7	1	...	9	10	2	...	1	...	3	?	?	87	·967	4·5	8	...	...	3·21	10·74	— 7·53	27·71	50·43	—22·72	Bogra.	
...	...	...	21	5	2	2	...	...	2	?	?	87	·967	5·5	7	..	...	2·59	11·21	8·62	30·94	53·21	—22·27	Dinajpur .	North Bengal.
...	...	1	15	5	7	1	1	...	2	?	?	88	?	2·0	8	...	...	5·49	13·02	— 7·53	42·24	63·10	—20 86	Rangpur.	
...	3	8	6	8	2	1	...	1*	3	?	?	90	·960	1·5	11	...	...	6·78	24·41	- 17·63	49·32	102·91	—53·59	Jalpaiguri.	
2	5	3	2	1	8	7	1	1	5	?	?	89	·946	5·2	20	...	...	19·63	11·32	+ 8·31	51·68	46·69	+ 4·99	Balasore .	Orissa.
...	3	...	...	2	8	6	9	2	10	8	+ 25	88	·960	8·4	18	...	...	18·58	11·53	+ 7·05	52·58	44·12	+ 8·46	False Point.	
1	1	3	4	...	5	9	6	1	2	2	0	82	·887	7·9	18	...	...	30·16	10·14	+20·02	62·41	45·67	+16·74	Cuttack.	
...	1	3	2	4	3	13	2	1*	12	?	?	86	·947	7·2	15	...	...	19·09	?	?	44·11	?	?	Shortt's Island.	
10	4	...	...	...	4	9	2	1	9	?	?	87	?	7·1	16	...	...	14·87	9·79	+ 5·08	33·30	38·67	— 5·37	Puri.	
...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	...	..	...	6·50	7·72	—1·12	...	...	...	**Gangetic Plain and Chota-Nagpur.**	
2	...	1	9	9	7	1	...	1	10	7	+ 43	88	·780	8·4	13	...	...	9·24	8·22	+ 1·02	38·37	42·50	— 4·13	Hazaribagh.	Chota-Nagpur.
7	3	4	2	5	4	2	2	1	7	?	?	87	?	8·5	21	...	...	13·82	8·19	+ 5·63	35·29	40·73	— 5·44	Ranchi.	
11	1	7	4	1	2	2	2	...	2	?	?	90	·893	7·5	16	...	...	12·94	8·11	+ 4·83	44·27	43·99	+ 0·28	Chaibassa.	
...	2	...	23	...	5	...	...	...	6	2	+200	86	·931	5·4	6	...	...	4·24	7·71	— 3·47	30·20	40·72	—10·52	Gaya .	Bihar, South.
1	1	...	13	12	...	1	1	1	5	?	?	83	?	5·0	12	...	...	4·76	?	?	17·17	?	?	Dehri.	
1	...	1	22	5	1	...	...	...	7	3	+133	81	·938	7·1	7	...	...	3·45	6·12	— 2·67	26·96	37·96	—11·00	Patna.	
...	1	5	10	9	3	1	...	1	1	?	?	86	?	2·6	9	...	...	4·71	8·25	— 3·54	22·71	37·86	—15·15	Arrah.	
1	1	2	23	2	1	...	...	...	7	?	?	83	?	5·8	9	...	...	5·05	7·37	— 2·32	17·43	33·81	—16·38	Buxar.	
11	...	2	9	6	2	...	...	...	2	2	0	87	·972	4·7	3	...	...	6·20	14·97	— 8·77	24·89	54·53	—29·64	Purnea .	Bihar, North.
9	...	...	6	12	3	...	...	...	2	?	?	84	?	5·9	8	...	...	3·11	7·76	— 4·65	32·09	38·34	— 6·25	Bhagalpur.	
...	1	4	14	9	...	1	1	...	4	4	0	85	·965	4·2	8	...	...	3·31	8·39	— 5·08	34·03	41·57	— 7·54	Darbhanga.	
1	...	3	13	10	3	...	..	...	6	?	?	87	?	3·9	4	...	...	1·22	8·42	— 7·20	29·03	36·80	— 7·77	Muzaffarpur.	
...	1	10	14	5	...	...	...	..	7	?	?	83	?	5·1	7	...	...	4·16	8·99	— 4·83	37·73	41·19	— 3·46	Motihari.	
...	1	1	24	4	...	...	...	...	5	?	?	86	?	4·6	9	...	...	3·12	7·29	— 4·17	21·50	33·58	—12·08	Chapra.	
6	2	2	14	3	...	1	2	...	5	4	+ 25	88	·950	6·7	9	...	...	6·71	5·54	+ 1·17	23·26	32·85	— 9·59	Benares .	N.-W. Provinces (East Districts).
2	2	9	10	1	...	2	4	...	6	3	+100	86	·950	7·4	9	...	...	7·57	5·29	+ 2·28	42·93	31·80	+11·13	Allahabad.	
...	2	5	14	5	3	..	1	...	3	2	+ 50	84	·946	4·2	10	...	...	7·45	8·14	— 0·69	51·02	40·35	+16·67	Gorakhpur	N.-W. Provinces (Eastern Sub-montane).
2	2	5	17	3	1	...	...	...	3	3	0	83	·947	7·2	13	...	..	9·71	5·61	+ 4·10	32·93	31·83	+ 1·10	Lucknow .	Oudh, South.
...	2	8	12	5	1	1	...	1	4	?	?	90	·982	7·2	13	...	...	12·82	4·57	+ 8·25	40·33	27·86	+12·47	Cawnpore .	N.-W. Provinces (Central).
...	...	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...	...	6·48	5·49	+0·99	...	...	...	**Upper—Sub-Himalayas.**	
17	...	3	4	4	1	1	...	...	2	3	— 33	88	·907	4·8	13	...	...	19·50	7·65	+11·85	56·12	43·15	+12·97	Bareilly .	N.-W. Provinces (Sub-montane).
26	...	1	...	1	1	1	..	...	1	1	0	89	·757	8·5	14	...	...	7·43	10·46	— 3·03	42·70	75·86	—33·16	Dehra Dun.	
20	2	1	2	3	2	...	...	...	1	2	— 50	87	·858	6·4	10	...	...	8·46	7·22	+ 1·24	40·53	37·55	+ 2·98	Roorkee.	
13	1	2	7	4	1	...	1	1	1	2	— 50	84	·865	5·0	9	...	...	7·02	5·82	+ 1·20	30·50	27·89	+ 2·61	Meerut.	
14	...	1	8	5	...	1	1	...	2	4	— 50	85	·887	4·7	12	...	..	6·68	4·59	+ 2·09	30·76	26·22	+ 4·54	Delhi .	Punjab (Central).
8	...	...	7	6	5	...	3	1	2	2	0	71	·810	2·0	3	...	...	1·22	2·84	— 1·62	8·84	16·66	— 7·82	Lahore.	

* Wind observations for 29 days only.

Table

Abstract of Observations taken at 8 A.M., at 160 Stations

Meteorological Province or District.	Station.	Height of Station in feet.	Pressure, 8 A.M., in inches. 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.	Temperature of Air. 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.
Punjab (Sub-montane).	Ludhiana	811·86	28·904	−·009	29·687	29·010	20th	28·780	1st	·230	81·5	94·6	−0·4	75·3	+0·3	85·0	−0·1	19·3	103·3	21st	71·0	24th	32·3
Punjab (North).	Sialkot	829·47	28·880	+·006	29·683	28·998	2 days	28·755	16th	·243	81·8	95·0	−0·5	75·7	+2·5	85·4	+1·0	19·3	100·7	18th	69·3	3rd	31·4
	Rawalpindi	1,648·9	28·085	−·003	29·676	28·221	25th	27·965	16th	·256	78·5	93·2	−0·4	72·0	+3·3	82·6	+1·5	21·2	99·0	14th	62·1	29th	36·9
Indus Valley and North-West Rajputana.		...	...	−·002	...	...	...	...	...	...	...	99·6	+2·4	77·4	+1·9	88·5	+2·2	22·2	...	...	...	...	34·1
Punjab, West	Peshawar	1,110·4	28·639	+·013	29·684	28·797	25th	28·504	16th	·293	80·5	98·2	+2·6	72·3	+2·3	85·2	+2·5	25·9	102·0	3 days	63·0	28th	39·0
	Khushab	611·51	29·087	?	29·670	29·245	25th	28·951	1st	·294	82·9	101·0	?	73·7	?	87·4	?	27·3	106·0	10th	67·0	3 days	39·0
	Montgomery	558·46	29·142	?	29·665	29·276	25th	29·006	1st	·270	87·0	102·7	?	78·7	?	90·8	?	24·0	110·4	3rd	72·7	24th	37·7
	D. I. Khan	572·56	29·111	−·010	29·657	29·281	25th	28·987	2 days	·294	81·6	103·2	+2·6	77·1	+2·0	90·1	+2·3	26·1	109·5	3rd	69·8	26th	39·7
	Mooltan	420·19	29·267	−·008	29·649	29·439	25th	29·120	1st	·319	86·1	103·1	+3·7	79·7	+2·4	91·4	+3·1	23·4	110·2	3rd	72·2	30th	38·0
	Sirsa	661·61	29·053	+·001	29·680	29·163	20th	28·926	1st	·237	83·4	98·4	+0·2	78·4	+3·6	88·4	+1·9	20·0	108·4	3rd	73·3	29th	35·1
Sind and Cutch.	Jacobabad	185·9	29·502	−·005	29·649	29·599	22nd	29·364	1st	·235	84·4	106·5	+3·9	77·8	+1·8	92·2	+2·9	28·7	112·2	11th	72·2	30th	40·0
	Hyderabad	117·43	29·603	+·002	29·675	29·708	22nd	29·478	1st	·230	81·9	99·4	+2·4	76·9	+0·7	88·2	+1·6	22·5	106·2	28th	75·1	22nd & 23rd.	31·1
	Kurrachee	49	29·721	−·006	29·723	29·799	25th	29·614	1st	·185	80·9	89·5	+1·4	77·7	+0·8	83·6	+1·1	11·8	93·0	27th & 28th.	75·8	14th & 22nd.	17·2
	Bhuj	394·9	29·381	?	29·727	29·445	14th	29·270	1st	·175	81·7	94·1	?	76·8	?	85·5	?	17·3	98·0	4th	74·5	21st	23·5
Rajputana, West	Bickaneer‡	743·5	29·081	?	29·781	29·167	1st	29·005	21st	·162	86·6	99·3	?	82·5	?	90·9	?	16·8	108·5	5th	72·5	11th	36·0
	Pachpadra	380	29·373	?	29·726	29·466	29th	29·258	1st	·208	83·5	99·4	?	76·7	?	88·1	?	22·7	105·0	3rd	71·6	1st	33·4
East Rajputana, Central India and Guzerat.		...	...	−·015	...	...	...	...	...	...	...	89·2	−0·5	75·0	+1·2	82·1	+0·3	14·2	...	...	...	...	23·5
Rajputana, East	Jeypore	1,430·6	28·320	−·019	29·712	28·413	21st	28·229	1st	·184	80·0	91·1	−1·7	74·5	+2·1	82·8	+0·2	16·6	99·1	3rd & 4th.	70·0	28th	29·1
	Sambhar	1,253·52	28·478	−·019	29·696	28·560	21st	28·369	1st	·191	80·7	92·4	+0·8	76·0	+2·2	84·2	+1·5	16·4	103·5	2nd	70·9	28th	32·6
	Ajmere	1,611	28·158	−·002	29·728	28·246	21st	28·035	1st	·211	80·8	93·9	+3·5	76·7	+4·2	85·3	+3·9	17·2	102·9	5th	70·6	10th & 11th.	32·3
	Deesa	465·5	29·318	−·009	29·741	29·396	21st	29·205	1st	·191	81·6	96·5	+4·5	76·9	+3·2	86·7	+3·9	19·6	102·4	28th	72·8	21st	29·6
Kathiawar	Rajkot	428·83	29·383	+·003	29·767	29·455	30th	29·271	1st	·184	80·1	92·5	+1·8	73·5	+0·9	83·1	+1·4	19·0	96·9	4th	70·8	13th	26·1
	Veraval	?	29·813	?	29·775	29·882	30th	29·688	1st	·194	80·4	84·3	?	77·5	?	81·0	?	6·8	86·8	2nd & 5th.	74·3	20th	12·5
	Bhavnagar	?	29·405	?	29·390	29·477	30th	29·301	1st	·176	81·8	92·3	?	76·7	?	84·5	?	15·6	96·4	1st & 4th.	74·0	7th, 20th & 22nd.	22·4
Central India	Nowgong	757·04	28·950	−·031	29·671	29·065	21st	28·812	8th	·253	78·1	86·4	−4·4	75·1	+0·2	80·8	−2·1	11·3	91·0	21st	72·5	6th	18·5
	Sutna	1,040·1	28·650	−·044	29·657	28·774	20th	28·505	8th	·269	78·3	86·2	−1·1	73·4	−1·1	79·8	−1·1	12·8	91·1	22nd	70·1	29th & 30th.	21·0
	Indore	1,823·2	27·953	−·012	29·742	28·054	21st	27·857	1st	·197	74·2	82·5	−2·3	70·0	−0·2	76·3	−1·3	12·5	87·0	3rd	66·1	4th	20·9
	Neemuch	1,630	28·134	−·017	29·732	28·232	21st	28·024	1st	·208	76·3	87·4	+0·2	72·1	+1·7	79·7	+1·0	15·3	92·8	3rd & 4th.	69·6	28th & 29th.	23·2
Guzerat	Surat	36	29·805	+·004	29·786	29·875	29th	29·686	1st	·189	79·6	87·3	−0·8	75·2	−0	81·3	−0·5	12·1	90·1	26th	70·0	4th	20·1
N.-W. P. (West)	Agra	555·44	29·181	−·005	29·700	29·296	20th	29·074	1st	·222	80·6	88·5	−3·8	76·5	+0·1	82·5	−1·9	12·0	93·5	1st	72·5	28th	21·0
	Jhansi	840·13	28·858	−·027	29·660	28·979	21st	28·721	9th	·258	79·3	87·7	−3·0	76·1	+1·1	81·9	−1·0	11·6	92·5	2 days	72·9	8th & 25th.	19·6
Deccan		...	...	−·016	...	...	...	...	...	...	...	84·2	−2·3	71·1	0	77·7	−1·2	13·1	...	..	...	...	21·8
Bombay, Deccan	Belgaum	2,524	27·362	+·011	29·844	27·415	14th	27·250	1st	·165	69·8	77·9	−0·7	64·7	−0·5	71·3	−0·6	13·2	81·8	23rd & 30th.	61·9	21st	19·9
	Sholapur	1,589·7	28·270	+·020	29·820	28·341	30th	28·146	1st	·195	75·0	88·6	+0·5	70·3	0	79·5	+0·3	18·3	94·7	24th & 25th.	68·0	16th	26·7
	Poona	1,840·37	28·021	+·008	29·823	28·085	14th	27·908	1st	·177	74·6	84·1	+0·5	68·5	−0·3	76·3	+0·1	15·6	88·5	26th	64·4	21st	24·1
Khandeish	Malegaon	1,430·12	28·394	+·005	29·788	28·483	30th	28·271	1st	·212	77·1	86·8	−0·2	71·0	+1·1	78·9	+0·5	15·8	90·4	28th	66·3	17th	24·1
	Ahmednagar	2,151·62	27·698	?	29·807	27·771	30th	27·588	1st	·183	73·7	84·3	?	68·0	?	76·2	?	16·3	87·3	23rd & 26th.	62·5	17th	24·8
Berar	Akola	930	28·846	−·010	29·738	28·932	21st	28·714	26th	·218	76·2	85·5	−2·8	72·1	−0·3	78·9	−1·6	13·4	90·9	24th	68·8	28th	22·1
	Amraoti	1,215·5	28·540	−·015	29·724	28·634	20th & 30th.	28·380	26th	·254	74·4	84·3	−3·4	71·9	+0·3	78·2	−1·6	12·4	90·8	24th	69·3	6th	21·5

I —*continued.*

in India, Burma, &c., in September 1891 —continued.

Wind Direction. Number of Winds from									Wind Velocity.			Hygrometry, 8 A.M.		Mean cloud amount.	Rainfall.									Station.	Meteorological Province or 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 1891.	Normal rainfall for period, 1st June to 30th September.	Variation from normal of period from 1st June to 30th September.		
20	...	1	2	3	1	...	3	...	1	1	0	79	·847	4·1	5	...	...	3·53	3·73	−0·20	11·43	24·58	−13·15	Ludhiana.	Punjab (Sub-montane).
6	2	3	16	2	1	...	...	...	2	2	0	81	·886	2·5	5	...	...	2·74	3·38	−0·64	21·10	23·37	−2·27	Sialkot .	Punjab, North.
9	1	3	1	9	...	...	...	7	2	1	+100	74	·729	1·5	3	...	...	1·74	3·72	−1·98	14·71	21·13	−6·42	Rawalpindi.	
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·56	1·01	−0·45	...	...	...	**Indus Valley and North-West Rajputana.**	
4	6	...	1	...	1	3	3	12	8	3	+167	64	·679	0·6	0	...	...	0·08	0·78	−0·70	1·09	4·51	−3·42	Peshawar .	Punjab, West.
2	2	11	11	1	1	1	...	1	4	?	?	66	·758	1·0	1	...	...	0·38	1·41	−1·03	6·27	6·98	−0·71	Khushab.	
1	...	3	3	9	10	3	...	1	7	?	?	66	·840	1·6	2	...	...	1·19	1·03	+0·16	8·14	7·72	+0·42	Montgomery	
17	...	5	5	2	...	1	...	...	1	2	−50	71	·755	1·1	2	...	...	0·37	0·32	+0·05	2·60	4·99	−2·39	D. I. Khan.	
15	1	...	...	6	...	7	...	1	1	3	−67	61	·753	0·9	1	...	...	0·22	0·37	−0·15	0·56	4·55	−3·99	Mooltan.	
2	...	1	11	6	5	2	3	...	6	4	+50	76	·876	2·8	4	...	...	2·09	1·54	+0·55	7·31	11·73	−4·42	Sirsa.	
12	...	...	5	11	2	...	...	...	3	3	0	64	·750	1·2	0	...	...	0·04	0·07	−0·03	0·46	2·88	−2·42	Jacobabad	Sind and Cutch.
...	...	3	...	1	1	24	1	...	13	13	0	66	·714	2·4	1	...	...	0·10	0·89	−0·79	0·61	6·77	−6·16	Hyderabad.	
...	1	...	...	2	...	4	17	6	15	15	0	81	·864	5·6	1	...	...	0·20	0·75	−0·55	0·21	6·32	−6·11	Kurrachee.	
...	1	...	...	...	2	2	19	6	17*	11	+55	75	·811	5·2	2	...	...	0·89	2·16	−1·27	5·40	13·33	−7·93	Bhuj.	
...	1	3	2	2	5	11	4	1	7	6	+17	55	·687	2·7	1	...	...	0·71	1·13	−0·42	4·22	9·85	−5·63	Bickaneer‡.	Rajputana, West.
...	2	1	1	...	3	12	8	3	?	?	?	63	·721	4·7	2	...	...	0·46	1·72	−1·26	8·37	8·83	−0·46	Pachpadra.	
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	8·06	4·95	+3·67	...	...	...	**East Rajputana, Central India and Guzerat.**	
5	3	4	7	1	...	...	4	6	4	5	−20	77	·793	5·0	10	...	...	6·79	3·73	+3·06	16·69	25·75	−9·06	Jeypore .	Rajputana, East.
8	3	1	5	1	...	...	10	2	8†	7	+14	74	·783	4·3	6	...	...	2·10	2·69	−0·59	10·42	20·41	−9·99	Sambhar.	
1	...	2	1	3	...	1	17	5	8	5	+60	71	·744	3·9	3	...	...	1·20	2·28	−1·08	6·29	20·75	−14·46	Ajmere.	
...	1	1	...	2	2	4	17	3	10†	8	+25	73	·790	6·3	3	...	...	1·57	3·17	−1·60	12·56	24·74	−12·18	Deesa.	
...	...	...	...	...	1	5	20	4	10	8	+25	84	·860	6·6	5	...	...	2·27	4·63	−2·36	25·70	29·22	−3·52	Rajkot .	Kathiawar.
3	1	...	1	...	2	5	14	4	10	?	?	85	·883	5·6	5	...	...	3·51	?	?	23·90	?	?	Veraval.	
...	...	...	...	...	5	22	3	...	14	?	?	85	·919	3·5	11	...	...	5·89	?	?	19·18	?	?	Bhavnagar.	
10	4	4	5	1	...	...	5	1	2	2	0	89	·868	7·9	18	...	...	15·02	5·41	+9·61	44·60	41·59	+3·01	Nowgong .	Central India.
1	8	3	5	2	4	...	6	1	6	6	0	89	·866	7·0	17	...	...	12·81	5·12	+7·69	42·90	37·40	+5·50	Sutna.	
1	5	...	...	..	...	2	11	11	5	5	0	89	·761	9·0	12	...	...	8·92	8·48	+0·44	27·53	32·62	−5·09	Indore.	
...	...	3	1	...	...	9	13	4	12	10	+20	85	·782	3·9	8	...	...	3·97	5·20	−1·23	19·90	29·91	−10·01	Neemuch.	
...	1	2	...	1	...	18	5	3	?	9	?	88	·898	6·9	10	...	...	12·38	7·99	+4·39	67·63	41·05	+26·58	Surat .	Guzerat.
2	...	10	...	8	...	...	...	10	4	4	0	89	·925	6·8	14	...	...	14·64	4·86	+9·78	29·52	27·98	+1·54	Agra . .	N.-W. P. (West).
5	5	6	1	2	1	3	1	6	3	3	0	89	·898	6·3	19	...	...	21·78	5·89	+15·89	38·36	36·58	+1·78	Jhansi.	
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	14·60	7·48	+7·12	...	...	...	**Deccan.**	
...	...	...	...	...	...	2	18	10	3	17	−82	89	·650	6·6	4	...	...	1·01	4·31	−3·30	34·08	36·18	−2·10	Belgaum .	Bombay, Deccan.
...	...	...	...	...	...	10	15	5	8	10	−10	89	·683	7·9	6	...	...	7·37	9·09	−1·72	17·45	27·19	−9·74	Sholapur.	
...	...	...	...	...	...	2	18	10	12	11	+9	79	·681	8·2	4	...	...	1·19	5·41	−4·22	13·07	19·84	−6·77	Poona.	
2	...	...	...	...	...	8	15	5	9	8	+13	77	·707	6·4	5	...	...	2·20	6·92	−4·72	13·67	21·51	−7·84	Malegaon .	Khandeish.
...	...	1	...	2	...	1	14	12	9	?	?	84	·696	6·0	10	...	...	7·96	7·86	+0·10	15·54	20·46	−4·92	Ahmednagar	
...	...	...	...	...	...	1	10	19	11	6	+83	86	·767	8·9	10	...	...	13·73	6·93	+6·80	29·59	30·80	−1·21	Akola .	Berar.
...	...	...	...	...	...	...	22	8	9	4	+125	92	·789	8·6	15	...	...	22·53	5·68	+16·85	36·90	30·77	+6·13	Amraoti.	

* Mean of 28 days. † Mean of 25 days. ‡ Mean of 29 days.

Table

Abstract of Observations taken at 8 A.M., at 160 Stations

Meteorological Province or District.	Station.	Height of Station 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.
Central Provinces (West).	Khandwa	1,043·71	28·723	−·011	29·737	28·814	21st & 22nd.	28·626	1st	·188	75·5	83·8	−3·6	73·4	+0·7	78·6	−1·5	10·4	88·2	4th	71·6	3rd & 30th.	16·6
	Hoshangabad	1,020	28·726	−·013	29·716	28·827	21st	28·624	27th	·203	75·6	84·3	−3·8	72·6	−0·6	78·5	−2·2	11·7	89·3	2nd	68·3	23rd.	21·0
	Nagpur	1,025	28·690	−·039	29·679	28·793	30th	28·508	25th	·285	76·8	84·1	−5·0	73·2	−0·4	78·7	−2·7	10·9	91·3	1st	69·2	6th	22·1
Central Provinces (Central).	Seoni	2,030	27·688*	−·056*	29·702*	27·809	20th	27·563	27th	·246	74·0	82·5	−2·9	69·8	−0·8	76·2	−1·9	12·7	86·1	3 days	66·1	6th	20·0
	Jubbulpore	1,327·02	28·377	−·043	29·672	28·502	20th	28·276	8th	·226	75·5	84·0	−3·1	72·8	0	78·4	−1·6	11·2	89·4	1st	69·1	6th	20·3
	Saugor	1,761·5	27·958	−·044	29·683	28·078	21st	27·848	8th	·230	75·0	83·0	−3·1	71·9	+0·9	77·4	−1·1	11·1	89·3	23rd	69·2	8th & 29th.	20·1
	Sehore	1,610	28·121	?	29·685	28·230	22nd	27·990	26th	·240	75·3	84·0	?	71·9	?	77·9	?	12·1	89·0	1st	65·2	11th	23·8
Central Provinces (East).	Raipur	960	28·744	−·028	29·672	28·868	30th	28·632	7th	·236	77·3	84·2	− 3·4	73·9	−0·7	79·1	−2·1	10·3	91·0	1st	70·1	6th	20·9
Hyderabad (South).	Secunderabad	1,786·69	28·034	−·004	29·779	28·118	29th	27·895	1st	·223	74·7	85·7	−0·8	70·8	+0·4	78·3	−0·2	14·9	89·1	9th	68·4	8th	20·7
West Coast		...	...	+·009	...	...	...	...	...	...	...	84·6	+0·8	73·3	+0·1	79·0	+0·5	11·3	...	...	...	...	15·3
Konkan	Bombay	37	29·839	+·005	29·817	29·903	30th	29·722	1st	·181	79·2	84·1	−·0·2	76·5	+0·2	80·3	0	7·6	86·4	15th & 29th.	73·0	29th	13·4
	Ratnagiri	110	29·785	+·023	29·834	29·846	15th	29·667	1st	·179	79·8	84·0	+0·1	73·3	−0·9	78·7	−0·4	10·7	85·9	4 days	71·4	13th & 18th.	14·5
	Mormugao	?	29·849	?	29·845	29·906	14th	29·723	1st	·183	79·2	84·2	?	75·4	?	79·8	?	8·8	86·0	24th	73·4	3 days	12·6
	Karwar	43·87	29·879	+·013	29·859	29·927	14th	29·766	1st	·161	77·0	83·5	+0·9	73·0	−0·4	78·3	+0·3	10·5	84·7	30th	71·8	16th & 17th.	12·9
Malabar	Mangalore	25·60	29·921	+·009	29·881	29·970	7th	29·822	1st	·148	77·1	83·9	+0·7	74·1	+0·3	79·0	+0·5	9·8	85·8	15th	71·4	10th	14·4
	Calicut	26·58	29·917	−·003	29·876	29·961	7th	29·832	1st	·129	79·0	85·5	?	74·7	?	80·1	?	10·8	87·3	27th	72·6	11th	14·7
	Cochin	11·03	29·946	+·008	29·886	29·990	7th	29·868	1st	·122	79·5	86·7	+2·6	75·1	+1·1	80·9	+1·9	11·6	88·2	26th & 30th.	73·7	6 days	14·5
	Trivandrum	?	29·602	?	29·880	29·653	8th	29·542	1st	·111	78·6	84·9	?	64·6	?	74·8	?	20·3	88·0	20th	62·5	? 16th	25·5
South India		...	...	+·008	...	...	...	...	...	...	...	91·8	+2·4	75·4	+0·9	83·6	+1·7	16·3	...	...	...	...	25·2
Madras, South	Pamban	37	29·861	?	29·825	29·933	29th	29·789	1st	·144	83·6	89·3*	?	79·6*	?	84·5*	?	9·7	91·3	21st & 23rd.	72·2	30th	21·1
	Madura	446·60	29·435	+·008	29·817	29·503	29th	29·356	1st	·147	84·0	99·5	+3·7	77·2	+2·1	88·4	+2·9	22·3	102·4	13th & 14th.	72·5	8th	29·9
Madras, South (Central).	Salem	939·91	28·979	+·008	29·864	29·048	30th	28·901	1st	·147	79·9	97·6	+6·5	73·5	+2·5	85·5	+4·5	24·1	101·9	17th	67·9	30th	34·0
	Coimbatore	1,347·64	28·547	+·004	29·853	28·614	30th	28·467	1st	·147	76·0	90·6	+1·3	70·7	+0·1	80·7	+0·7	19·9	93·3	13th & 14th.	66·6	10th	26·7
Coorg	Mercara	3,780·7	26·234	?	29·886	26·285	28th	26·150	1st	·135	64·9	71·8	−0·7	62·3	+0·4	67·1	−0·2	9·5	76·8	30th	60·7	12th	16·1
Mysore	Bangalore	2,981·46	26·985	+·024	29·899	27·041	11th	26·885	1st	·156	70·7	85·3	+3·4	66·0	+1·1	75·7	+2·3	19·3	89·2	14th	62·0	10th	27·2
Madras, East Coast (South).	Negapatam	15	29·848	+·008	29·810	29·931	29th	29·777	1st & 17th	·154	83·7	95·8	+3·7	78·0	+1·7	86·9	+2·7	17·8	100·2	8th	73·7	15th	26·5
	Cuddalore	12·44	29·849	?	29·792	29·921	28th	29·770	1st	·151	83·5	95·3	?	77·4	?	86·4	?	17·9	101·3	6th	72·2	29th	29·1
	Trichinopoly	254·78	29·628	+·005	29·818	29·714	30th	29·543	1st	·171	82·1	98·9	+3·8	76·4	+1·1	87·7	+2·5	22·5	102·1	5th & 14th.	71·4	28th & 30th.	30·7
	Madras	22	29·845	+·020	29·800	29·934	29th	29·753	1st	·181	83·8	97·2	+3·5	78·7	+1·7	88·0	+2·6	18·5	101·5	3 days	72·5	28th	29·0
Madras, East Coast (Central).	Nellore	70·82	29·759	?	29·767	29·869	29th	29·650	1st	·219	83·8	96·6	?	78·8	?	87·7	?	17·8	102·3	16th	72·1	28th	30·2
	Masulipatam	15·0	29·795	+·006	29·747	29·905	28th	29·674	1st	·231	81·9	93·5	+2·0	77·9	+0·5	85·7	+1·3	15·6	99·7	11th & 15th.	73·1	26th	26·6
Madras, Central	Cuddapah	433·36	29·443	?	29·819	29·493	29th	29·319	1st	·174	82·1	94·9	?	76·6	?	85·8	?	18·3	99·2	16th & 27th.	71·7	29th	27·5
	Kurnool	923·45	28·935	?	29·809	29·001	29th	28·815	1st	·186	78·8	91·3	?	73·5	?	82·4	?	17·8	95·5	26th	70·4	7th & 12th.	25·1
	Bellary	1,474·63	28·400	+·025	29·832	28·463	30th	28·276	1st	·187	78·6	92·9	+1·9	73·4	+0·5	83·2	+1·2	19·5	96·9	15th & 16th	70·0	10th & 11th.	26·9
Madras, East Coast (North).	Rajahmundry	112	29·672	?	29·723	29·787	29th	29·556	1st	·231	81·1	89·4	?	77·0	?	83·2	?	12·4	94·0	22nd	72·0	27th	22·0
	Cocanada	26	29·756	?	29·719	29·880	28th & 29th	29·634	1st	·246	81·3	88·9	?	76·7	?	82·8	?	12·2	92·7	17th	72·6	27th	20·1
	Vizagapatam	31	29·724	−·016	29·695	29·875	29th	29·594	1st	·281	84·3	87·8	+0·2	81·4	+1·6	84·6	+0·9	6·4	92·9	10th	77·4	27th & 28th.	15·5
	Gopalpur	21·45	29·710	−·002	29·673	29·854	30th	29·556	6th	·298	81·8	86·7	−0·8	78·1	−2·2	82·4	−1·5	8·6	90·2	22nd	75·8	3 days	14·4
Hill Stations		...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Beluchistan	Quetta	5,502·28	24·623	+·040	?	24·694	25th	24·546	1st	·148	68·0	86·3	+0·8	50·7	−0·1	68·5	+0·4	35·6	90·6	19th	43·4	29th	47·2

* Mean of 29 days.

I —*continued.*

in India, Burma, &c., in September 1891 —continued.

Wind Direction. Number of Winds from: Calm.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	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 1891.	Normal rainfall for period 1st June to 30th September.	Variation from normal of period from 1st June to 30th September.	Station.	Meteorological Province or District.
...	...	...	...	...	...	2	22	6	8	6	+33	87	·763	8·1	9	...	...	8·12	7·63	+0·49	31·62	29·84	+1·78	Khandwa	Central Provinces (West).
4	1	1	1	...	5	8	10	...	6	2	+200	93	·834	9·1	22	...	...	22·70	12·00	+10·70	61·11	53·91	+7·20	Hoshangabad.	
...	3	...	1	...	3	6	11	6	10	5	+100	87	·808	8·8	24	...	...	24·69	8·89	+15·80	50·08	43·94	+6·14	Nagpur.	
...	3	...	2	2	2	4	8	9	5	4	+25	96	·814	7·1	19	...	...	24·95	9·75	+15·20	74·89	50·84	+24·05	Seoni	Central Provinces (Central).
2	1	3	2	3	2	6	9	2	3	3	0	92	·811	8·8	22	...	...	28·84	6·87	+21·97	73·57	52·97	+20·60	Jubbulpore.	
...	1	4	4	1	...	4	11	5	4	3	+33	93	·800	8·0	22	...	...	29·39	5·79	+23·60	62·88	39·29	+23·59	Saugor.	
...	...	...	...	...	...	...	...	...	...	...	...	90	·786	7·0	17	...	...	18·06	8·79	+9·27	?	?	?	Sehore.	
4	...	...	2	3	3	8	9	1	10	6	+66	89	·835	8·7	16	...	...	15·09	8·31	+6·78	53·33	48·02	+5·31	Raipur	Central Provinces (East).
...	1	...	...	...	...	4	16	9	10	3	+233	80	·699	6·8	10	...	...	5·82	5·44	+0·38	14·40	24·46	−10·06	Secunderabad	Hyderabad (South).
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...	10·03	11·21	+0·10	...	...	...	**West Coast.**	
...	2	...	1	4	6	5	10	2	11	11	0	87	·875	8·0	21	...	...	22·62	12·16	+10·46	75·78	73·58	+2·20	Bombay	Konkan.
...	1	1	2	4	2	14	4	2	8	8	0	86	·874	6·5	22	...	...	21·22	14·54	+6·68	97·41	103·72	−6·31	Ratnagiri.	
8	1	2	1	...	3	...	11	4	6	?	?	87	·877	5·4	18	...	...	9·48	?	?	59·07	?	?	Mormugao.	
12	2	6	...	...	...	2	8	...	1	?	?	89	·829	5·4	22	...	...	10·29	13·09	−2·80	72·91	113·87	−40·96	Karwar.	
21	5	1	1	...	...	...	...	2	2	2	0	96	·897	7·4	16	...	...	8·33	11·05	−2·72	81·51	106·12	−24·61	Mangalore	Malabar.
14	6	...	...	1	2	...	...	7	6	?	?	84	·828	4·4	6	...	...	2·09	5·86	−3·77	72·75	84·89	−12·14	Calicut.	
7	4	16	1	...	1	...	1	...*	4	?	?	84	·856	3·8	10	...	...	3·35	10·58	−7·23	58·09	76·84	−18·75	Cochin.	
...	22	7	...	...	...	..	...	1	11	?	?	82	·809	4·6	8	...	...	2·85	?	?	36·45	?	?	Trivandrum.	
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3·42	5·37	−1·76	...	...	...	**South India.**	
2	1	1	1	2	9	11	2	1	9	?	?	73	·840	2·8	1	...	...	0·18	?	?	0·18	?	?	Pamban.	Madras, South.
...	11	...	...	...	1	...	1	17	2	3	−33	58	·679	2·3	3	...	...	1·66	4·60	−2·94	6·04	10·80	−4·76	Madura	
4	...	1	...	...	13	9	2	1	3	4	−25	71	·736	4·5	7	...	..	4·21	6·41	−2·20	11·10	21·75	−10·65	Salem	Madras, South (Central).
...	1	1	...	...	20	5	2	1	5	7	−29	84	·762	4·4	0	...	...	0	1·04	−1·04	2·66	5·24	−2·58	Coimbatore.	
...	...	...	...	...	...	...	21	9	5	7	−29	91	·566	8·1	11	...	...	6·77	11·87	−5·10	92·80	109·68	−16·88	Mercara	Coorg.
...	...	...	...	...	...	5	24	1	9	7	+29	78	·583	7·2	2	...	...	0·68	5·08	−4·40	14·48	18·46	−3·98	Bangalore	Mysore.
...	1	...	...	...	2	10	15	2	3	5	−40	64	·749	5·6	1	...	...	0·20	3·46	−3·26	2·21	10·87	−8·66	Negapatam	Madras, East Coast (South).
...	...	...	1	...	1	7	9	12	3	?	?	75	·859	4·4	6	...	...	2·55	4·68	−2·13	4·97	13·81	−8·84	Cuddalore.	
3	...	...	...	...	...	2	16	9	7	7	0	68	·740	5·5	6	...	...	4·83	3·44	+1·39	11·88	10·76	+1·12	Trichinopoly	
2	...	...	...	...	4	8	15	1	7	9	−22	69	·800	6·1	2	...	...	2·16	4·53	−2·37	5·77	15·77	−10·00	Madras.	
...	...	...	...	...	4	2	...	24	10	?	?	70	·797	8·1	6	...	...	3·75	3·13	+0·62	8·29	9·85	−1·56	Nellore	Madras, East Coast (Central).
2	...	...	...	...	3	3	10	12	5	6	−16	82	·890	6·1	9	...	...	5·99	5·08	+0·91	20·72	23·00	−2·28	Masulipatam.	
...	1	...	...	...	1	6	12	10	?	?	?	67	·730	7·1	8	...	...	3·60	5·28	−1·68	11·65	17·35	−5·70	Cuddapah.	Madras (Central).
27	...	...	...	...	1	2	...	...	?	?	?	73	·717	5·5	9	...	...	2·73	6·03	−3·30	9·46	20·20	−10·74	Kurnool.	
4	...	...	...	...	...	...	17	9	12	9	+33	66	·649	5·8	2	...	...	0·63	3·76	−3·13	4·46	9·70	−5·24	Bellary.	
7	...	...	...	...	...	2	11	10	?	?	?	83	·891	7·0	14	...	...	8·65	6·96	+1·69	23·59	25·22	−1·63	Rajahmundry	Madras, East Coast (North).
2	1	...	...	1	2	5	18	1	7	?	?	77	·822	5·8	11	..	...	7·53	6·50	+1·03	22·17	21·66	+0·51	Cocanada.	
...	1	...	...	...	...	3	22	4	3	2	+50	75	·877	7·3	9	...	...	3·42	7·00	−3·58	14·50	21·68	−7·18	Vizagapatam.	
1	5	...	...	1	6	11	2	4	12	7	+71	85	·916	4·8	10	...	...	5·50	7·74	−2·24	16·85	30·95	−14·10	Gopalpur.	
...	...	...	...	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	**Hill Stations.**	
30	...	...	...	...	...	...	...	...	0	3	0	52	·367	0·9	1	...	...	0·45	0·14	+0·31	0·52	1·34	−0·82	Quetta	Beluchistan.

* Observation for 24 days only.

Table

Abstract of Observations taken at 8 A.M., at 160 Stations

Meteorological Province or District.	Station.	Height of Station 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.
Beluchistan—*contd.*	Shebo	?	?	?	?	?	?	?	?	?	69·4	90·8	?	66·0*	?	78·5*	?	24·8	96·8	19th	57·1	1st	39·7
Northern India	Murree	6,343·86	23·867	+·040	?	23·973	20th	23·781	8th	·192	64·0	74·1	0	59·3	+0·2	66·7	+0·1	14·8	79·6	17th	52·3	7th	27·3
	Simla	7,274	23·057	+·010	?	23·164	19th	22·975	1st	·189	61·1	67·9	−3·4	57·7	+0·5	62·8	−1·5	10·2	71·4	2 days	54·1	3 days	17·3
	Mussoorie	?	23·578	?	?	23·652	25th	23·516	16th	·136	61·7	67·9	0	56·4	−1·4	62·2	−0·7	11·5	71·3	5 days	51·0	3 days	20·3
	Ranikhet	6,068·75	24·064	+·011	?	24·166	20th	23·982	16th	·184	63·6	70·3	−2·2	60·6	+0·6	65·5	−0·8	9·7	76·5	23rd	55·5	28th	21·0
	Darjeeling	7,421·1	23·007	+·005	?	23·097	20th	22·917	1st & 16th	·180	60·5	65·8	+0·9	56·6	+1·4	61·2	+1·2	9·2	71·1	21st	53·6	29th	17·5
	Kalimpong	?	25·985	?	?	26·116	7th	25·896	13th	·220	68·8	76·7	?	66·7	?	71·7	?	10·0	79·8	11th & 23rd	64·3	21st	15·5
Central India	Mount Abu	3,945	25·983	−·004	?	26·039	14th & 22nd.	25·902	1st	·137	68·4	75·8	+0·2	63·9	−1·1	69·9	−0·5	11·9	80·7	28th	60·9	29th & 30th.	19·8
	Pachmarhi	3,511	26·331	−·039	?	26·454	21st	26·232	27th	·222	68·4	73·5	−3·6	65·8	−0·5	69·6	−2·1	7·7	78·7	2nd	60·2	6th & 7th.	18·5
South India	Wellington	6,200	24·263	+·037	?	24·317	28th	24·193	1st	·124	65·8	73·2	+2·2	55·4	−0·4	64·3	+0·9	17·8	78·2	17th	49·2	23rd	29·0
Extra India		...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Persia	Bushire	14	29·712	?	29·682	29·825	30th	29·603	1st	·222	87·0	93·7	?	79·5	?	86·6	?	14·2	98·5	1st	72·8	23rd	25·7
Arabia	Aden	94·1	29·734	?	29·758	29·798	14th & 15th	29·640	11th	·158	87·3	94·1	?	83·9	?	89·0	?	10·2	98·1	7th	80·8	26th	17·3
	Perim	?	29·621	?	?	29·692	30th	29·489	8th	·203	87·6	95·6	?	85·6	?	90·6	?	10·0	99·3	25th	82·2	16th & 21st	17·1
Arabian Sea Islands.	Minicoy	10·5	29·971		29·907	30·032	14th	29·891	1st	·141	80·9	84·5	?	79·6	?	82·1	?	4·9	86·1	26th & 27th	76·9	11th	9·2
Africa	Zanzibar	73	30·082	?	30·083	30·125	3rd	30·039	7th	·086	75·7	82·0	?	73·4	?	77·7	?	8·6	84·1	29th	71·3	17th	12·8

* Mean of 29 days.

I —*concluded.*

in India, Burma, &c., in September 1891 —concluded.

Wind Direction. Number of Winds from: Calm.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	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 1891.	Normal rainfall for period, 1st June to 30th September.	Variation from normal of period from 1st June to 30th September.	Station.	Meteorological Province or District.
11	...	1	3	7	2	3	2	1	5*	?	?	53	·381	0·7	1	...	...	0·16	?	?	?	?	?	Shebo .	Beluchistan—*contd.*
10	1	2	1	...	1	3	1	11	5	5	0	71	·430	3·3	9	...	...	10·10	5·70	+4·40	28·88	31·93	−3·05	Murree .	Northern India.
14	...	1	2	5	6	...	...	2	?	2	?	85	·459	6·0	15	...	...	11·53	5·83	+5·70	56·42	47·93	+8·49	Simla.	
...	5	3	12	3	2	1	1	3	?	8	?	92	·511	6·1	24	...	...	10·35	9·72	+0·63	46·93	77·74	-30·81	Mussoorie	
28	...	...	2	...	...	...	...	...	0	2	0	90	·527	7·6	15	...	...	7·85	6·82	+1·03	45·43	38·44	+6·99	Ranikhet.	
14	1	4	8	2	...	1	...	...	4	3	+33	92	·488	7·4	15	...	...	5·74	16·21	−10·47	69·61	99·95	−30·34	Darjeeling.	
10	...	6	1	7	...	2	1	1‡	?	?	?	94	·663	3·8	14	...	...	8·62	?	?	45·72	?	?	Kalimpong.	
...	2	2	...	1	1	3	14	7	8	7	+14	82	·562	5·4	6	...	...	2·28	6·55	−4·27	40·11	57·91	−17·80	Mount Abu	Central India.
1	1	1	1	...	...	4	14	8	8	6	+33	93	·649	9·2	26	...	...	56·96	13·31	+43·65	115·76	70·14	+45·62	Pachmarhi.	
11	2	...	...	1	2	10	3	1	3	3	0	62	·392	4·0	3	...	...	1·56	4·90	−3·34	11·13	14·86	−3·73	Wellington .	South India.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	**Extra India.**	
...	3	1	3	17	...	...	1	5	6	8	−25	69	·890	0	0	...	...	0	0	0	0	0	0	Bushire .	Persia.
15	...	5	2	1	2	5	...	...	10	9	+11	75	·966	2·2	0	...	...	0	0·08	−0·08	0·70	0·39	+0·31	Aden .	Arabia.
...	5	1	8	4	...	5	5	2	13	?	?	77	1·013	3·9	0	...	...	0	?	?	?	?	?	Perim.	
...	...	...	...	...	...	8	18	4	15*	?	?	82	·868	5·7	12	...	...	3·86	?	?	?	?	?	Minicoy .	Arabian Sea Islands
...	...	...	...	6	13	11	...	...	?	5	?	84	·746	6·7	8	..	...	2·21	?	?	?	?	?	Zanzibar .	Africa.

* Mean of 29 days. † Mean of 13 days ‡ Observations for 28 days only.

Table

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

Station.	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 to 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.
Murree	23·870	23·829	·041	23·842	+·016	29+ ?	74·1	58·6	15·5	77·9	52·1	25·8	67·7	70·7	65·1	−0·4	54·2	61·2	63·7	59·7
Chamba	26·827	26·731	·096	26·787	−·013	?	83·6	67·1	16·5	88·0	60·8	27·2	76·1	80·4	73·7	+0·6	65·0	69·3	72·9	69·1
Kailang	20·792	20·728	·064	20·768	+·024	?	69·9	44·8	25·1	80·0	35·0	45·0	60·4	65·0	55·2	+1·2	42·9	52·3	52·7	49·3
Simla	23·078	23·017	·061	23·040	−·003	?	67·8	57·6	10·2	71·4	54·1	17·3	63·5	63·9	61·5	−0·4	55·3	60·2	61·4	58·9
Peshawar	28·655	28·524	·131	28·584	0	·661	98·1	72·3	25·8	102·3	63·2	39·1	87·9	96·1	84·5	+2·8	66·8	74·3	75·3	72·1
Lahore	29·033	·919	·114	·970	+·001	·631	98·2	76·5	21·7	104·0	70·1	33·9	90·0	95·3	86·4	+3·0	72·7	77·9	77·6	76·1
Ludhiana	28·924	·814	·110	·863	−·013	·636	94·6	75·6	17·5	98·6	71·9	26·7	86·2	92·1	83·8	+0·3	74·1	77·6	78·2	76·6
Mooltan	29·278	29·173	·104	29·220	−·015	·597	103·0	79·9	23·1	110·2	74·2	36·0	91·2	101·9	91·0	+4·1	71·3	78·4	82·3	77·3
Jacobabad	·522	·400	·122	·455	−·011	·596	106·5	77·6	28·8	112·6	70·8	41·8	93·8	103·4	91·1	+2·9	70·9	77·6	77·6	75·4
Hyderabad	·611	·514	·097	·565	−·011	·632	99·3	77·3	22·0	106·2	74·9	31·3	90·2	95·4	87·1	+1·8	72·4	74·7	75·8	74·3
Kurrachee	·729	·647	·081	·690	−·009	·691	89·5	77·7	11·7	93·0	75·8	17·2	85·9	85·9	82·5	+1·1	74·9	78·0	78·7	77·2
Jeypore	28·334	28·233	·101	28·280	−·015	·657	90·8	74·5	16·3	99·1	70·2	28·9	84·4	86·6	81·0	−1·0	71·8	75·7	76·2	74·6
Ajmere	·171	·061	·110	·110	−·015	·658	93·7	77·1	16·6	102·9	70·6	32·3	85·4	91·8	84·5	+3·0	72·8	75·1	76·7	74·9
Mount Abu	26·000	25·925	·075	25·961	−·005	?	75·8	64·5	11·3	80·8	60·9	19·9	71·3	74·1	69·7	+0·8	62·8	66·0	67·5	65·4
Chakrata	23·238	23·178	·060	23·200	−·024	?	68·8	58·0	10·8	73·3	55·1	18·2	64·9	64·3	62·1	+0·4	56·9	61·7	61·9	60·2
Ranikhet	24·082	24·022	·060	24·038	+·008	?	70·1	60·6	9·6	76·5	55·5	21·0	66·0	67·3	64·4	−1·2	58·9	63·1	63·7	61·9
Pithoragarh	·744	·673	·071	·695	+·052	?	74·3	62·6	11·7	81·3	56·1	25·2	69·2	71·7	67·6	−1·7	61·5	66·3	67·0	64·9
Dehra	27·564	27·473	·091	27·511	+·014	·687	83·5	70·6	12·8	87·2	67·1	20·1	78·0	78·8	75·6	−1·6	69·5	73·3	74·1	72·3
Roorkee	28·871	28·769	·103	28·814	+·016	·663	89·5	75·4	14·1	95·5	71·6	23·9	83·2	85·7	81·2	−0·8	72·8	77·0	77·7	75·9
Meerut	29·022	·913	·109	·959	+·019	·659	88·2	75·6	13·2	92·8	71·0	21·8	83·7	94·6	80·9	−2·1	75·0	78·2	77·9	77·0
Agra	·197	29·092	·105	29·139	−·002	·651	88·8	76·5	11·7	92·4	72·3	20·1	84·0	85·3	81·9	−1·4	75·4	79·6	79·5	78·2
Lucknow	·356	·244	·112	·303	−·025	·629	88·8	77·1	12·8	94·8	73·3	21·5	85·0	86·5	82·6	−1·3	75·4	80·0	80·1	78·5
Allahabad	·404	·277	·127	·344	−·037	·604	90·9	77·6	12·9	94·6	73·4	21·2	85·8	87·5	82·7	−0·4	76·2	80·2	80·2	78·9
Ghazipur	·514	·390	·124	·456	−·007	·628	91·7	79·5	12·2	96·2	74·7	21·5	87·0	87·9	84·3	+1·4	77·3	80·7	80·4	79·5
Nowgong	28·956	28·853	·103	28·907	−·037	·617	86·2	75·1	11·1	91·0	72·5	18·5	81·1	82·4	79·2	−2·8	74·3	77·6	77·8	76·6
Sutna	·663	·551	·112	·609	−·047	·605	86·0	74·0	12·0	91·1	70·1	21·0	81·6	83·2	78·7	−1·7	73·1	77·2	77·4	75·9
Darbhanga	29·607	29·480	·127	29·549	+·006	·657	91·1	79·1	12·0	95·9	76·0	19·9	86·7	87·8	84·1	+1·4	77·8	80·9	80·5	79·7
Patna	·563	·440	·123	·507	−·010	·641	91·6	79·8	11·8	95·0	76·2	18·8	87·2	88·3	84·4	+0·9	77·4	80·0	79·9	79·1
Hazaribagh	27·747	27·650	·097	27·702	−·010	·644	84·0	72·1	11·9	88·7	68·3	20·4	79·0	80·5	76·8	−0·1	71·0	74·1	74·7	73·3
Darjeeling	23·023	22·961	·067	22·997	+·037	?	65·8	56·5	9·2	70·9	53·4	17·5	63·0	63·2	60·5	+2·0	54·8	60·9	61·4	59·0
Pedong	25·275	25·176	·099	25·228	+·006	?	75·9	64·6	11·3	79·7	61·5	18·2	72·2	72·4	69·4	+2·2	63·4	69·7	69·6	67·6
Berhampore	29·702	29·581	·121	29·644	−·002	·660	89·6	78·2	11·5	94·2	75·3	18·9	84·7	86·2	82·8	−0·2	76·9	79·9	79·9	78·9
Burdwan	·671	·550	·120	·614	−·001	·659	89·5	79·0	10·5	93·2	76·4	16·8	84·6	85·5	82·9	−0·6	77·5	78·8	78·7	78·4
Calcutta (Alipore)	·737	·629	·108	·685	−·001	·651	86·9	77·6	9·3	91·1	74·0	17·1	83·4	83·4	81·9	−0·4	76·1	79·3	79·0	78·1
Calcutta (Chowringhee)	·743	?	?	?	?	?	88·6	77·9	10·7	93·0	74·8	18·2	84·6	?	83·3	?	77·1	80·5	?	?
Saugor Island	·727	·625	·102	·678	−·005	·647	87·3	79·1	8·2	90·0	75·3	8·2	84·1	84·1	82·0	−0·6	77·3	80·4	80·0	79·2
Dacca	·771	·649	·122	·715	+·004	·685	89·5	78·8	10·7	92·9	74·4	18·5	85·0	86·9	83·8	+0·9	76·5	80·1	80·9	79·2
Chittagong	·729	·630	·099	·684	+·002	·718	87·6	76·2	11·4	91·7	74·1	17·6	84·7	83·9	80·7	+0·2	75·1	79·5	79·7	78·1
Demagiri	Not recorded.						87·3	76·4	10·9	90·2	74·7	15·5	84·3	85·8	81·5	+1·9	Not recorded.			
Tura							84·6	73·0	11·6	91·0	71·1	19·9	79·7	81·2	78·0	?	?	75·9	76·7	?
Dhubri	·683	·548	·134	·622	−·011	·690	88·3	78·1	10·2	91·7	74·9	16·8	83·2	86·0	81·5	+2·3	76·4	79·2	79·8	78·5
Sibsagar	·461	·317	·145	·391	−·038	·677	89·9	77·3	12·6	95·1	74·1	21·0	83·8	87·5	82·0	+1·2	76·4	80·0	81·4	79·3

II.

at 89 Stations in India, Burma, &c., for September 1891.

Vapour Tension.					Humidity.					Cloud.				Wind Direction. Number of Winds from											Wind Steadiness.		Wind Velocity.		Station.
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.	
·379	·480	·523	·460	+·045	76	70	70	72	+ 7	4·7	4·9	4·8	+1·5	24	2	3	3	9	3	3	1	10	S 74° E	S 52° E	2	8	112	130	Murree.
·598	·642	·724	·655	+·107	89	71	70	77	+10	5·0	4·9	5·0	+1·9	13	7	...	1	...	...	1	6	32	N 44° W	N 10° E	67	9	79	106	Chamba.
·263	·327	·296	·295	?	87	62	49	66	?	5·5	5·3	5·4	+0·9	...	1	...	...	4	6	21	17	11	S 68° W	S 57° W	67	63	52	34	Kailang.
·414	·488	·519	·473	+·023	87	83	87	86	+ 8	7·7	9·1	8·4	+3·0	18	...	3	3	16	6	3	1	3	S 37° E	S 78° W	36	30	?	?	Simla.
·598	·682	·621	·634	+·039	75	52	37	54	− 1	0·5	2·4	1·5	−0·1	4	17	18	6	4	1	...	2	8	N 24° E	N 41° E	59	53	74	76	Peshawar.
·755	·796	·711	·754	+·036	83	57	44	61	+ 6	1·9	2·3	2·1	+0·7	11	6	5	5	6	9	5	9	4	S 31° W	N 60° E	8	13	54	49	Lahore.
827	·833	·790	·817	+·056	93	67	55	72	+ 6	5·4	5·1	5·2	+2·5	27	8	...	3	7	2	...	11	2	N 61° W	N 40° W	8	13	24	28	Ludhiana.
·652	·799	·840	·764	−·029	64	55	42	54	− 7	1·1	1·4	1·2	+0·3	8	...	8	...	13	...	25	...	6	S 22° W	S 32° W	30	33	31	63	Mooltan.
·672	·730	·602	·669	−·025	71	46	29	46	− 7	1·0	1·6	1·3	+0·7	24	...	2	5	14	8	5	2	...	S 28° E	S 36° E	38	41	70	70	Jacobabad.
·733	·651	·628	·671	−·079	78	46	38	54	− 8	2·4	3·2	2·8	+1·2	0	...	3	...	2	...	51	1	3	S 47° W	S 40° W	82	75	337	300	Hyderabad.
·831	·856	·886	·865	+·036	87	69	71	78	+ 2	3·5	2·3	2·9	−1·1	...	1	...	...	2	...	15	35	7	N 83° W	S 62° W	84	83	356	359	Kurrachee.
·738	·782	·774	·765	+·089	86	66	63	72	+ 8	5·0	6·3	5·7	+2·2	1	6	11	12	3	...	...	8	19	N 1° E	N 27° W	42	45	85	121	Jeypore.
·754	·743	·731	·743	+·050	82	62	50	65	− 2	3·8	4·2	4·0	+0·8	...	2	11	6	2	...	5	26	8	N 62° W	N 80° W	38	44	195	119	Ajmere.
·555	·582	·598	·579	+·034	91	77	71	80	+ 4	6·0	5·8	5·9	−0·1	...	4	9	1	1	1	14	21	9	N 80° W	S 67° W	50	27	205	175	Mount Abu.
·456	·519	·533	·502	+·033	93	84	88	89	+ 6	8·1	9·6	8·9	+2·5	2	2	3	9	...	2	12	29	1	S 78° W	S 74° W	47	36	97	113	Chakrata.
·490	·549	·557	·532	+·022	91	85	83	86	+ 5	8·5	8·7	8·6	+2·7	48	...	1	5	...	1	5	...	...	S 30° E	S 52° W	7	39	5	50	Ranikhet.
·538	·620	·616	·592	+·019	94	86	79	87	+ 7	8·1	7·7	7·9	+2·2	40	...	2	6	...	1	11	...	...	S 3° W	S 14° E	12	34	50	61	Pithoragarh.
·709	·764	·786	·753	?	94	80	80	85	?	7·2	7·5	7·3	+2·6	6	6	6	4	6	11	7	9	4	S 31° W	N 80° W	13	18	29	27	Dehra.
·774	·862	·848	·828	+·058	88	76	70	78	+ 5	5·7	6·4	6·1	+2·3	35	1	...	3	9	8	...	2	2	S 26° E	S 6° E	22	9	32	49	Roorkee.
·865	·895	·867	·876	+·118	98	78	73	83	+21	6·5	5·7	6·1	+2·4	15	2	4	14	16	2	3	3	1	S 66° E	N 34° W	40	17	3	47	Meerut.
·867	·954	·933	·918	+·136	95	82	77	84	+17	7·0	6·8	6·9	+3·2	...	5	15	...	12	1	3	...	24	N	N 26° W	35	13	95	99	Agra.
·860	·963	·943	·922	+·084	93	80	75	82	+ 9	7·4	7·7	7·5	+2·1	...	5	18	24	7	2	1	1	2	N 73° E	N 1° E	67	14	80	68	Lucknow.
·888	·957	·933	·926	+·030	94	77	72	81	+ 1	7·4	7·2	7·3	+2·1	3	4	13	24	5	1	2	3	5	N 69° E	N 42° E	52	11	152	75	Allahabad.
·909	·967	·942	·939	+·065	90	75	72	79	+ 3	6·2	5·6	5·9	+0·8	6	...	1	24	21	3	4	...	1	S 62° E	S 28° E	68	7	51	58	Ghazipur.
·841	·902	·894	·879	+·087	97	85	81	88	+15	7·9	8·1	8·0	+2·4	1	5	11	12	5	5	1	16	4	N 31° E	N 67° W	12	28	52	57	Nowgong.
·803	·879	·871	·851	+·086	96	81	77	85	+12	6·7	6·7	6·7	+1·8	5	14	9	6	8	4	2	6	6	N 25° E	N 55° W	25	31	136	155	Sutna.
·937	·976	·947	·953	+·015	94	77	73	82	− 1	4·2	3·9	4·1	−1·4	2	1	7	26	19	1	4	...	...	S 75° E	S 86° E	72	54	102	90	Durbhunga.
·912	·931	·910	·918	+·002	90	72	69	77	− 3	6·6	6·9	6·8	−0·2	...	...	1	41	13	3	1	1	...	S 76° E	S 77° E	85	42	156	70	Patna.
·749	·785	·788	·774	+·012	95	79	76	83	+ 2	8·7	8·7	8·7	+0·9	1	1	5	19	12	17	3	1	1	S 51° E	S 64° E	59	21	230	169	Hazaribagh.
·414	·511	·530	·484	+·005	90	89	91	90	− 4	8·1	7·9	8·1	0	22	...	15	9	1	...	5	2	2	N 60° E	S 72° E	27	12	92	73	Darjeeling.
·573	·697	·693	·654	+·036	94	88	87	89	− 2	7·3	8·4	7·8	+0·7	...	1	5	12	14	13	...	...	1	N 51° E	?	65	?	?	?	Pedong.
·909	·957	·935	·934	−·001	94	80	76	83	− 3	7·3	7·0	7·2	−0·9	1	1	1	27	9	14	4	1	2	S 55° E	S 41° E	59	36	99	88	Berhampore.
·926	·910	·893	·910	−·022	93	76	73	81	− 1	7·6	7·7	7·7	+0·4	4	1	2	12	14	17	8	1	...	S 30° E	S 31° E	59	38	91	71	Burdwan.
·884	·947	·935	·922	−·033	93	83	82	86	− 1	8·2	7·7	8·0	+0·9	...	1	5	14	17	11	8	3	1	S 41° E	S 27° E	52	43	112	103	Calcutta (Alipore).
·924	·989	?	?	?	97	84	?	?	?												Not recorded								Calcutta (Chowringhee).
·919	·990	·976	·962	−·018	92	84	83	87	+ 1	8·1	7·8	8·0	+1·3	...	...	5	9	16	17	9	2	2	S 25° E	S 4° W	55	48	304	241	Saugor Island.
·883	·963	·977	·941	−·025	90	80	76	82	− 4	7·3	6·3	6·8	+0·1	...	1	2	5	18	21	6	4	3	S 15° E	S 11° E	59	57	151	111	Dacca.
·858	·941	·961	·920	+·005	95	79	83	86	0	8·0	8·1	8·0	+1·4	6	1	...	...	17	17	13	4	2	S 4° W	S 29° E	60	31	84	109	Chittagong.
?	?	?	?	?	?	?	?	?	?	2·7	5·5	4·1	+0·5	6	...	...	1	51	1	1	...	...	S 44° E	N 83° W	88	5	?	?	Demagiri.
?	·855	·866	?	?	?	84	81	?	?	4·8	4·7	4·7	−1·6	...	2	2	10	3	22	18	2	1	S 3° W	S 4° W	55	56	?	?	Tura.
·888	·944	·935	·922	+·026	92	83	75	83	− 4	6·4	6·2	6·3	−0·1	9	...	15	7	4	1	23	...	1	S 21° E	S 66° E	15	28	98	77	Dhubri.
·871	·947	·960	·926	+·008	93	82	76	84	− 2	7·5	6·8	7·2	−0·9		...	24	7	7	2	19	...	1	S 80° E	N 73° E	25	18	45	59	Sibsagar.

Table

Abstract of Observations recorded at 10 A.M. and 4 P.M., at 89 Stations

Station.	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 to 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.
Silchar	29·704	29·570	·133	29·642	−·016	29·697	91·2	76·8	14·5	99·6	73·7	25·9	84·5	88·1	82·8	+1·3	75.6	79·8	80·5	78·7
False Point	·734	·632	·102	·685	−·016	·648	86·3	77·3	8·9	89·5	73·9	15·6	83·6	84·0	80·9	−1·0	76·1	79·7	79·8	78·4
Cuttack	·662	·557	·105	·614	−·022	·636	88·1	77·7	10·4	97·4	74·8	22·6	84·7	85·8	82·0	−0·5	76·0	78·5	78·8	77·8
Sambalpur	·244	·133	·111	·192	−·033	·597	87·5	76·6	10·9	90·5	74·4	16·1	82·7	83·4	81·0	−1·3	74·3	78·2	78·3	77·0
Raipur	28·758	28·641	·117	28·701	−·033	·607	84·1	73·7	10·4	90·0	69·9	20·1	79·9	82·2	78·5	−2·0	72·1	75·7	76·5	74·8
Khandwa	·733	·634	·099	·685	−·013	·687	83·9	73·4	10·5	88·2	71·6	16·6	79·1	81·3	77·3	−1·7	71·3	74·1	75·1	73·5
Hoshangabad	·737	·634	·103	·687	−·027	·667	84·0	72·6	11·4	89·5	68·3	21·2	78·6	80·1	76·6	−3·0	72·1	75·6	76·8	74·9
Saugor	27·941	27·837	·104	27·890	−·059	·596	83·0	71·9	11·1	89·3	69·1	20·2	77·6	79·6	75·8	−1·5	70·9	74·8	75·9	73·9
Jubbulpore	28·391	28·281	·109	28·337	−·035	·616	84·0	72·7	11·3	88·7	69·3	10·8	78·1	80·3	76·7	−2·1	71·8	74·7	75·8	74·1
Pachmarhi	26·345	26·264	·080	26·306	−·030	?	73·5	65·8	7·7	78·5	60·2	18·3	69·7	70·9	68·4	−2·0	64·5	67·9	68·6	67·0
Seoni	27·699	27·610	·089	27·656	−·045	·611	82·5	69·6	12·9	86·1	66·1	20·0	76·3	77·5	74·6	−1·5	68·5	75·0	76·7	73·4
Nagpur	28·700	28·592	·107	28·647	−·032	·626	83·9	73·4	10·4	89·3	69·4	19·9	79·4	80·0	77·7	−2·7	70·8	75·5	76·0	74·1
Chanda	29·137	29·024	·113	29·082	−·014	·663	85·2	72·9	12·4	88·6	69·0	19·6	80·4	81·6	78·2	−2·3	71·4	75·0	75·5	74·0
Sironcha	·387	·272	·115	·331	−·027	·677	87·0	75·0	12·0	89·4	71·4	18·0	80·4	81·3	79·6	−1·8	73·6	77·0	77·4	76·0
Chikalda	26·219	26·139	·080	26·180	−·041	?	70·6	65·2	5·4	76·3	63·4	12·9	67·6	69·2	67·0	−2·1	64·9	66·7	68·2	66·6
Buldana	27·674	27·577	·098	27·626	−·020	·694	80·7	69·5	11·2	85·1	67·3	17·8	75·7	78·3	74·5	−1·3	67·4	71·0	72·3	70·2
Akola	28·858	28·742	·116	28·801	−·012	·683	85·6	72·6	13·0	90·8	69·7	21·1	79·8	83·5	78·5	−1·3	71·0	74·5	75·4	73·6
Makhla			Not re	corded.			73·9	67·6	6·3	80·2	65·7	14·5	69·9	71·3	70·1	−1·3	66·8	68·8	69·9	68·5
Deesa	29·326	29·206	·121	29·265	−·018	·679	96·4	76·8	19·5	102·5	72·8	29·7	86·9	93·1	85·3	+3·6	73·2	76·1	76·3	75·2
Bombay	·850	·764	·086	·804	+·020	·781	84·1	76·3	7·8	87·0	73·2	13·8	81·2	81·3	79·7	0	74·0	77·7	76·9	76·2
Poona	28·027	27·940	·087	27·989	+·016	·776	84·4	68·4	16·0	88·4	64·5	23·9	78·4	78·9	74·3	−0·2	66·9	71·3	70·9	69·7
Sholapur	·270	28·138	·132	28·214	+·006	·744	88·9	70·2	18·7	94·5	67·9	26·6	80·4	86·3	78·2	+0·6	68·8	72·3	74·0	71·7
Ratnagiri	29·798	29·714	·084	29·753	+·030	·801	84·0	73·5	10·5	86·1	71·6	14·5	82·3	82·0	78·4	−0·3	71·9	77·5	77·3	75·6
Karwar	·895	·809	·086	·849	+·032	·825	83·2	73·5	9·6	85·0	71·8	13·2	80·0	81·1	77·8	+0·2	72·7	75·9	76·5	75·0
Belgaum	27·373	27·285	·088	27·331	+·015	·791	78·2	64·7	13·5	84·2	61·7	22·5	73·7	74·0	70·0	−0·5	64·1	68·8	68·7	67·2
Secunderabad	28·042	·929	·113	·996	+·001	·721	85·8	70·8	15·0	89·3	68·6	20·7	79·2	81·1	76·4	−0·9	69·2	72·8	73·9	71·9
Vizagapatam	29·742	29·620	·122	29·683	−·015	·651	87·7	81·3	6·4	92·8	77·5	15·3	86·5	87·2	84·4	−0·6	73·9	78·5	79·2	77·2
Bellary	28·401	28·265	·136	28·344	+·009	·750	93·1	73·4	19·7	97·0	70·0	27·0	84·2	90·0	81·8	+1·6	67·9	72·1	72·3	70·8
Madras*	29·741	29·785	·142	29·787	+·013	·767	97·0	78·8	18·2	101·6	72·4	29·2	93·3	83·3	84·8	+0·9	?	78·4	78·5	77·3
Salem	28·981	28·815	·166	28·911	−·011	·780	97·4	73·8	23·6	101·7	68·2	33·5	86·4	93·6	83·3	+4·2	70·9	74·4	76·6	73·9
Mercara	26·245	26·160	·085	26·203	−·036	·868	71·9	62·4	9·5	76·7	60·6	16·1	67·0	67·5	65·6	−0·6	61·2	65·1	65·4	63·9
Trichinopoly	29·632	29·473	·159	29·565	−·003	·748	98·9	76·5	22·4	101·0	71·6	30·3	89·4	95·8	85·4	+2·5	71·6	75·2	76·9	74·6
Cochin	·956	·861	·095	·905	+·013	·843	86·6	75·4	11·2	88·2	73·7	14·5	83·1	84·3	80·4	+1·5	74·1	77·5	77·9	76·5
Wellington	24·270	24·191	·079	24·231	+·036	?	73·0	55·2	17·8	78·2	49·1	29·1	68·5	67·7	63·8	+1·7	52·2	60·2	60·3	57·6
Akyab	29·822	29·712	·110	29·771	+·007	·734	85·9	?	?	89·4	?	?	81·9	82·9	81·8	+0·4	74·4	79·2	79·3	77·6
Diamond Island	·842	·748	·094	·798	+·010	·774	83·9	71·3	12·6	88·3	68·6	19·7	80·4	80·1	76·3	−2·5	71·0	77·0	76·5	74·8
Rangoon	·829	·728	·101	·779	−·009	·757	81·5	74·9	10·2	98·8	73·0	25·8	80·3	78·4	78·1	−0·6	73·7	78·0	76·3	76·0
Mergui	·826	·724	·102	·777	+·003	·805	81·8	68·2	13·6	88·2	66·4	21·8	78·8	78·4	74·1	−3·3	66·6	76·0	75·7	72·8
Cocos Island	·781	·700	·082	·743	?	?	84·3	?	?	87·2	?	?	81·5	81·0	?	?	?	78·5	77·8	?
Port Blair	·842	·753	·090	·800	+·019	·792	85·0	76·8	8·2	89·1	74·4	14·7	82·3	81·8	79·7	+0·2	74·3	79·0	78·5	77·3
Quetta	24·629	24·548	·081	24·581	+·031	?	86·1	50·7	35·4	90·5	43·5	47·0	78·1	83·9	67·6	+0·7	46·2	59·5	59·5	55·1
Leh	19·760	19·647	113	19·712	+·024	?	73·5	44·4	29·1	80·7	36·7	44·0	62·3	68·5	55·4	−0·8	37·2	47·8	49·4	44·8
Katmandu	25·592	25·501	·091	25·550	+·005	?	91·2	66·1	25·2	97·4	60·7	36·7	77·1	78·1	75·4	+1·5	64·8	70·7	71·7	69·1
Minicoy	29·982	29·892	·090	29·939	?	·874	84·5	79·5	5·0	86·1	76·9	9·2	82·5	83·1	81·7	?	75·5	77·5	77·7	76·9
Aden	·737	·613	·124	·676	−·013	·700	94·3	83·7	10·6	97·3	77·4	19·9	89·5	91·7	88·4	+1·4	74·8	80·2	79·6	78·2
Perim	·638	·517	·121	·577	?		95·7	85·4	10·3	99·3	81·9	17·4	90·9	92·1	89·7	?	64·7	82·5	82·3	76·5
Zanzibar	30·094	·986	·108	30·041	?	30·041	82·1	73·4	8·7	84·1	71·3	12·8	77·3	81·5	77·6	?	70·0	72·9	72·6	71·9

* The hours of observations are 14 hours and 20 hours (in case of winds the results are calculated from the hourly means

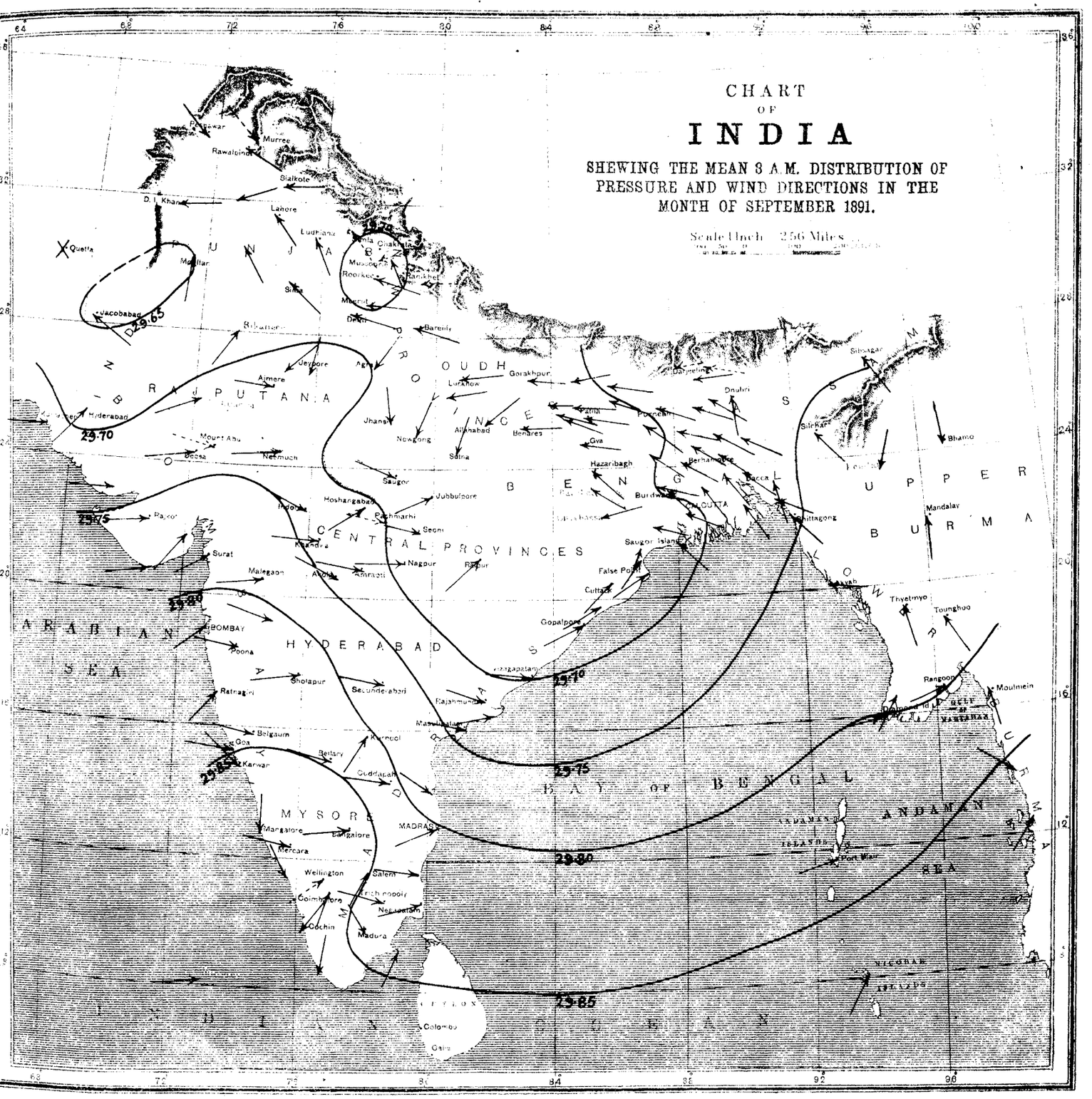
II —*concluded.*

in India, Burma, &c., for September 1891 —concluded.

Vapour Tension.					Humidity.					Cloud.				Wind Direction. Number of Winds from											Wind Steadiness.		Wind Velocity.		Station.
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.	
·877	·955	·942	·924	+·019	94	81	72	82	− 2	8·1	7·7	7·9	+0·8	41	...	2	3	2	...	1	6	5	N 59° W	S 89° W	8	2	17	62	Silchar.
·887	·966	·915	·933	+·005	94	84	81	86	+ 2	8·2	7·9	8·0	+1·3	...	5	2	2	8	17	14	9	3	S 26° W	S 25° W	45	36	240	195	False Point.
·879	·892	·892	·888	−·012	92	75	73	80	− 1	7·5	7·8	7·6	+1·2	2	4	10	1	4	12	15	8	4	S 43° W	S 10° W	27	20	58	57	Cuttack.
·818	·903	·900	·874	−·027	89	81	80	83	+ 2	7·3	7·4	7·4	+1·7	...	3	4	5	8	13	18	7	2	S 18° W	S 49° W	42	13	105	57	Sambalpur.
·769	·835	·837	·814	+·011	92	82	77	84	+ 6	9·1	8·5	8·8	+2·2	6	2	2	3	3	4	21	15	4	S 61° W	S 69° W	50	29	235	142	Raipur.
·740	·777	·792	·770	+·031	90	78	75	81	+ 7	7·9	7·3	7·6	+2·3	...	4	...	...	...	1	1	33	21	N 70° W	N 69° W	87	66	189	145	Khandwa.
·785	·851	·884	·840	+·054	98	87	86	90	+12	8·9	9·2	9·0	+3·2	3	3	5	4	1	7	17	17	3	S 64° W	N 86° W	42	50	141	58	Hoshangabad.
·748	·832	·852	·810	+·085	96	88	85	89	+13	7·9	8·0	7·9	+3·5	...	5	5	4	4	3	11	18	10	N 84° W	N 77° W	38	43	91	80	Saugor.
·768	·821	·838	·809	+·038	95	85	82	87	+10	8·6	8·7	8·7	+2·6	...	3	6	2	5	2	6	24	12	N 77° W	N 69° W	47	34	76	79	Jubbulpore.
·594	·663	·673	·644	+·016	93	91	89	91	+ 9	9·2	8·6	8·9	+1·7	1	5	...	2	1	...	10	27	14	N 80° W	N 58° W	70	45	?	134	Pachmarhi.
·687	·855	·915	·821	+·124	95	94	97	95	+20	7·3	7·5	7·4	+3·5	...	7	3	5	5	3	4	16	17	N 60° W	N 56° W	38	29	159	93	Seoni.
·722	·838	·850	·803	+·036	87	84	84	85	+10	9·1	9·5	9·3	+2·1	1	5	1	1	1	7	15	18	11	S 82° W	N 54° W	57	37	236	118	Nagpur.
·754	·795	·801	·783	−·026	93	76	74	81	+ 3	8·3	8·1	8·2	+1·3	3	1	1	1	1	...	23	22	8	S 77° W	N 70° W	72	42	142	97	Chanda.
·809	·886	·891	·862	+·019	93	86	84	87	+ 7	8·1	8·0	8·1	+1·8	20	3	...	1	2	4	10	15	5	S 76° W	N 85° W	40	41	57	70	Sironcha.
·615	·650	·679	·648	+·018	98	97	95	97	+ 9	9·6	9·1	9·4	+2·2	3	15	...	...	...	1	...	8	33	N 40° W	N 23° W	82	62	347	224	Chikalda.
·646	·700	·718	·686	+·001	89	79	75	80	+ 2	8·0	6·5	7·3	+0·9	2	6	...	...	...	...	...	7	45	N 46° W	N 48° W	90	64	229	194	Buldana.
·741	·783	·773	·765	+·031	93	77	68	79	+ 6	9·0	9·3	9·1	+2·7	...	3	...	...	...	...	2	17	38	N 58° W	N 66° W	90	66	262	139	Akola.
?	?	?	?	?	?	?	?	?	?	10·0	9·9	10·0	+1·5	...	7	...	...	...	1	9	9	34	N 59° W	S 89° W	77	51	?	?	Makhla.
·770	·757	·684	·741	+·012	83	59	45	61	− 6	6·1	5·9	6·0	+1·0	...	5	3	1	2	3	13	24	5	S 85° W	S 65° W	57	50	249	203	Deesa.
·811	·902	·868	·860	−·009	89	85	81	85	− 1	7·8	7·6	7·7	+0·3	...	2	1	1	3	5	13	32	3	S 74° W	S 89° W	68	55	272	274	Bombay.
·641	·679	·658	·670	−·004	92	70	67	79	+ 2	8·0	7·7	7·9	+0·1	...	...	...	...	...	...	5	35	20	N 79° W	N 89° W	90	70	297	258	Poona.
·688	·695	·689	·698	+·036	93	67	56	73	+ 3	7·5	8·2	7·9	−0·2	1	...	...	...	...	...	11	36	12	N 89° W	N 73° W	87	68	196	236	Sholapur.
·763	·879	·875	·849	+·012	93	80	80	88	+ 4	5·2	5·4	5·3	−0·6	1	4	...	1	...	5	17	29	3	S 75° W	S 88° W	73	55	177	188	Ratnagiri.
·793	·839	·851	·831	+·010	96	82	80	87	0	4·9	5·3	5·1	−0·8	1	4	1	...	...	...	1	33	20	N 69° W	N 86° W	84	78	35	?	Karwar.
·594	·643	·636	·633	−·015	97	78	76	86	+ 1	7·0	6·7	6·9	−0·6	...	...	...	...	...	8	28	21	3	S 59° W	N 84° W	84	82	453	400	Belgaum.
·696	·725	·748	·723	+·030	92	73	72	79	+ 4	6·9	7·6	7·3	+1·4	...	2	...	...	...	...	4	28	26	N 70° W	N 78° W	89	67	233	82	Secunderabad.
·733	·875	·898	·835	−·048	68	69	70	69	− 4	7·4	8·4	7·9	+2·3	...	1	...	1	...	6	23	24	5	S 68° W	S 60° W	77	48	78	49	Vizagapatam.
·613	·635	·575	·608	−·050	74	53	41	56	− 9	6·8	8·4	7·6	+0·3	7	1	...	...	...	...	2	29	21	N 72° W	N 78° W	80	74	280	217	Bellary.
?	·773	·911	·838	+·029	?	50	80	71	− 1	3·6	5·1	4·4	−1·6	...	...	...	1	12	17	21	9	...	S 20° W	S 36° W	72	53	181	205	Madras.*
·717	·693	·691	·700	−·046	86	56	45	62	−11	4·1	5·9	5·0	−0·4	...	...	2	...	3	11	30	10	4	S 45° W	S 68° W	72	77	80	85	Salem.
·528	·600	·603	·577	0	93	91	89	91	0	7·3	8·0	7·7	−1·0	...	...	...	...	...	...	...	45	15	N 79° W	N 72° W	95	84	117	178	Mercara.
·709	·686	·668	·687	−·040	78	50	40	56	− 8	5·1	6·1	5·6	−1·5	7	1	1	1	1	...	4	20	25	N 68° W	N 80° W	68	80	165	167	Trichinopoly.
·831	·867	·876	·858	+·025	94	76	74	81	− 4	2·3	4·5	3·4	−2·0	2	1	2	...	...	...	1	11	43	N 52° W	N 82° W	87	61	91	?	Cochin.
·363	·437	·446	·415	−·013	83	63	67	71	− 6	6·5	7·7	7·1	+0·2	7	1	...	...	2	6	19	13	12	S 71° W	S 79° W	59	33	70	74	Wellington.
?	·964	·954	?	?	?	88	85	?	?	7·9	7·7	7·8	+0·8	...	4	3	5	9	22	7	8	2	S 2° W	S 9° E	43	41	83	73	Akyab.
·757	·886	·866	·837	−·040	98	85	84	89	+ 2	8·4	8·6	8·5	+1·5	3	1	...	1	3	6	19	18	9	S 68° W	S 39° W	62	58	143	159	Diamond Island.
·816	·931	·884	·877	−·019	94	90	91	92	+ 3	8·7	9·0	8·9	+0·8	...	3	3	2	1	8	22	21	...	S 59° W	S 23° W	62	59	81	91	Rangoon.
·634	·863	·854	·784	−·061	92	88	88	89	0	9·5	9·3	9·4	+0·8	...	2	...	...	...	2	16	6	34	N 73° W	S 64° W	72	59	56	36	Mergui.
?	·938	·912	?	?	?	87	86	?	?	8·4	8·7	8·4	?	...	1	...	...	4	10	29	15	...	S 45° W	?	78	?	?	?	Cocos Island.
·816	·948	·933	·899	+·005	88	86	86	87	− 1	7·7	8·8	8·3	+1·4	...	...	1	...	1	2	27	26	3	S 68° W	S 43° W	81	73	301	213	Port Blair.
·276	·319	·259	·285	+·023	72	33	23	43	+ 4	0·8	1·8	1·3	+0·8	58	...	...	...	...	...	...	1	1	N 68° W	N 56° W	3	50	?	80	Quetta.
·164	·210	·189	·188	+·021	56	38	28	41	0	4·6	5·3	5·0	+1·1	2	...	4	2	...	4	27	17	4	S 63° W	S 59° W	63	32	28	41	Leh.
·615	·670	·704	·666	+·040	94	73	74	81	+ 3	6·3	7·5	6·9	+0·9	4	2	3	33	3	1	...	11	3	N 82° E	S 86° W	40	37	20	?	Katmandu.
·829	·876	·879	·861	?	82	79	77	80	?	5·5	5·7	5·6	?	1	1	...	...	...	...	15	37	6	S 84° W	?	87	?	?	?	Minicoy.
·744	·908	·851	·835	−·014	64	65	57	62	− 4	2·1	1·7	1·9	−0·4	14	...	2	9	8	16	8	2	...	S 18° E	S 31° E	46	51	245	215	Aden.
·350	1·000	·973	·774	?	29	69	65	54	?	1·9	3·2	2·6	?	...	10	6	13	7	2	2	7	13	N 17° E	?	27	?	286	?	Perim.
·692	·753	·685	·710	?	84	80	64	76	?	7·0	4·5	5·8	?	...	1	5	1	5	19	10	2	1	S 4° W	S 12° W	57	46	?	113	Zanzibar.

and the means are as given in the registers sent by the Government Astronomer, Madras.

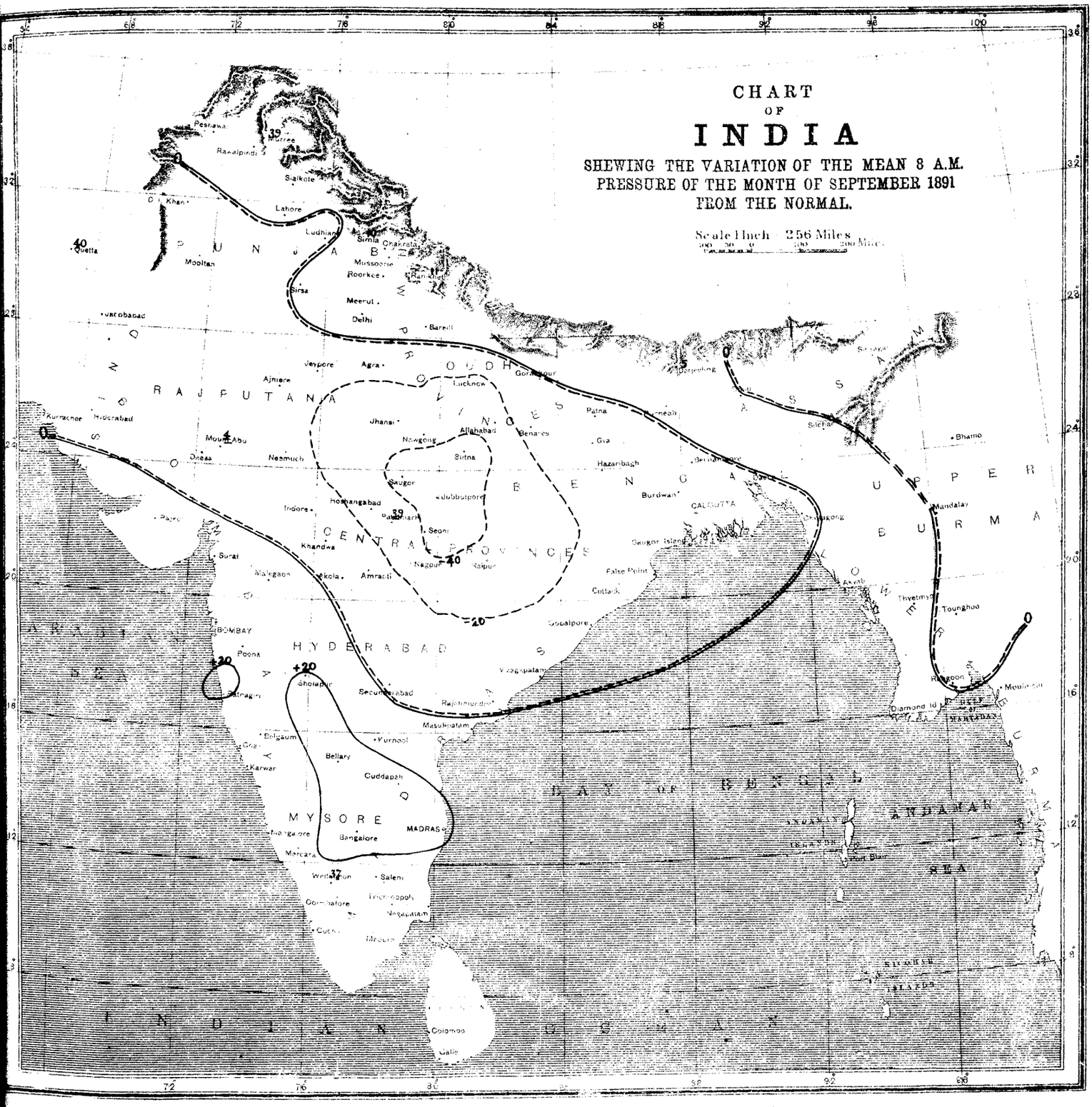
GOVERNMENT OF INDIA CENTRAL PRINTING OFFICE.—No. 103 METRO.—4-5-93.—400.



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.



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 ariation (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.

Reg. No. 29, Wr., I.—Feb. 92.—415.

Photo-litho. S. I. O., Calcutta.

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

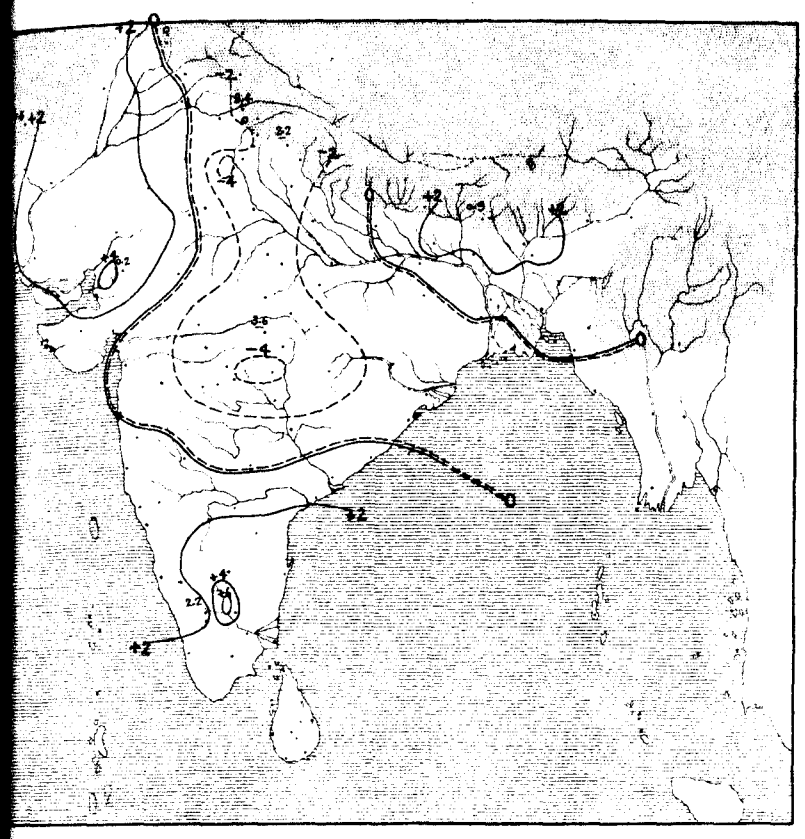
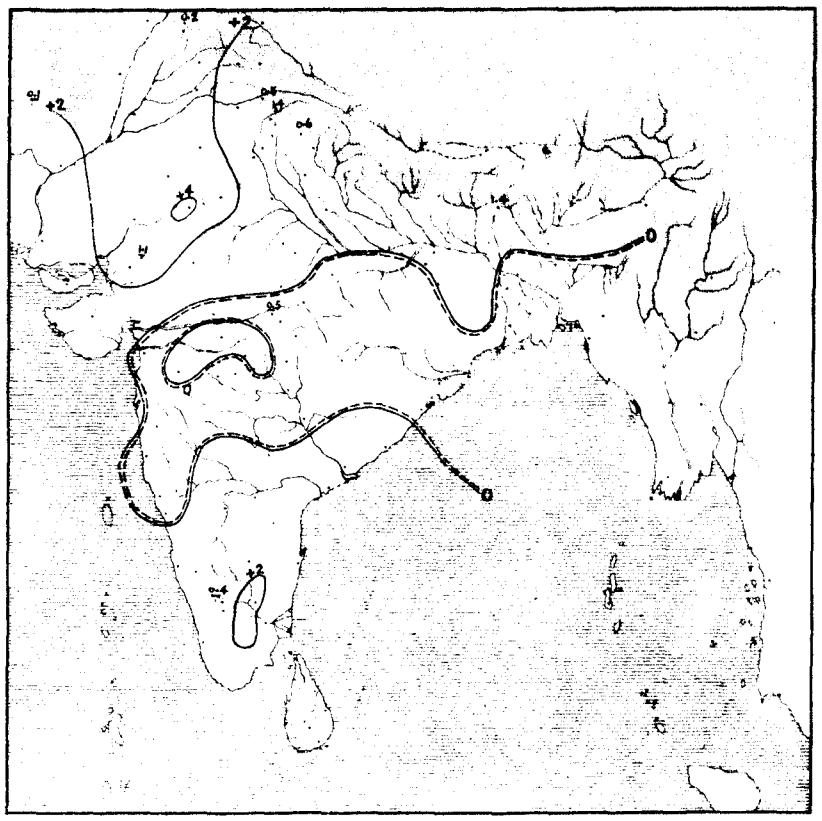


CHART SHEWING THE VARIATION OF THE MEAN MINIMUM TEMPERATURE OF THE MONTH FROM THE NORMAL.



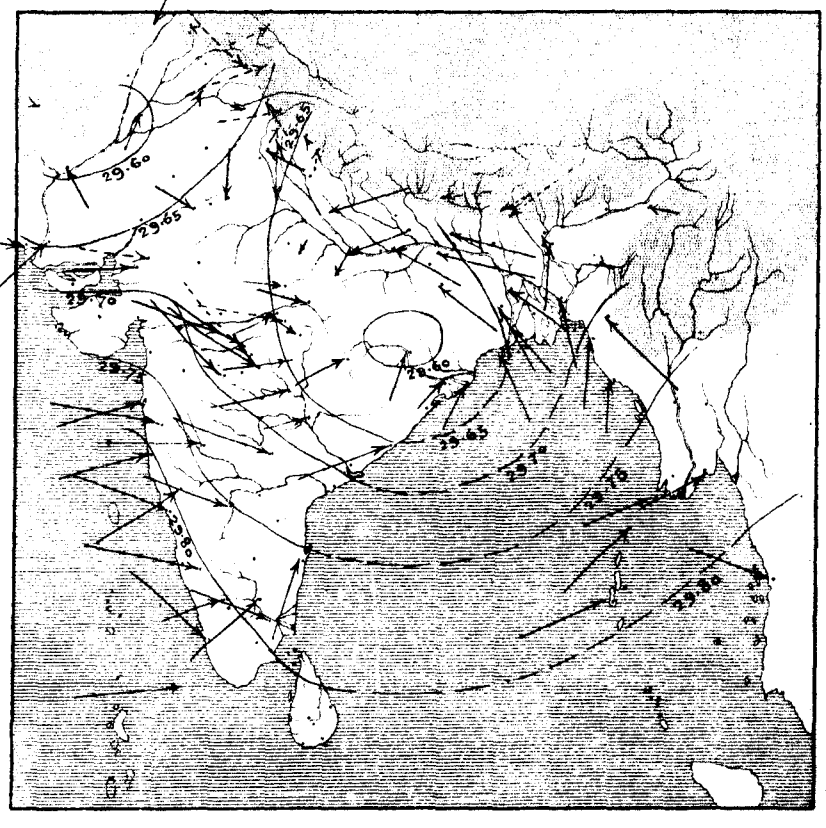
Explanation.

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 1891.



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.

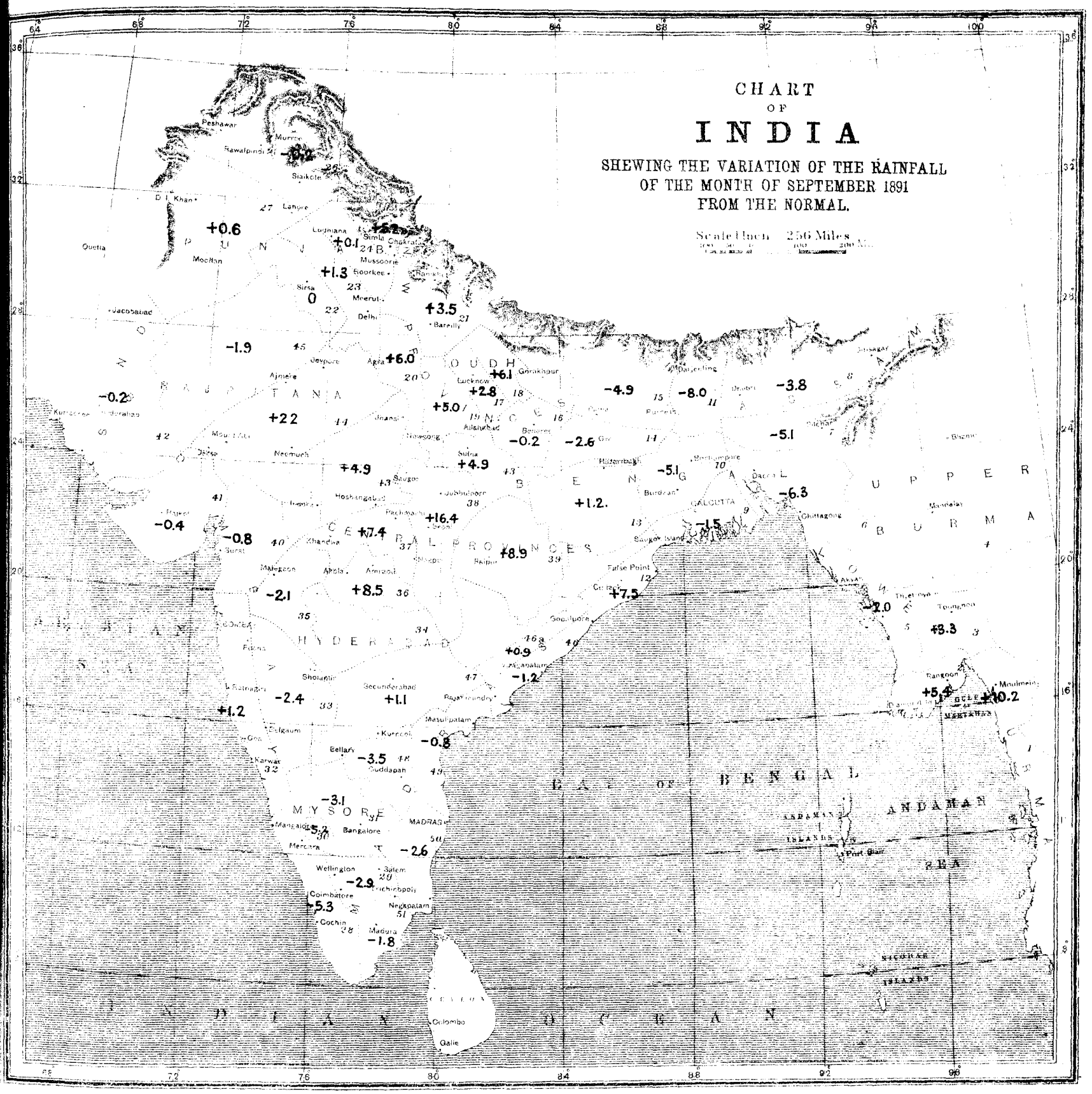
The Chart is prepared in the same manner as the Monthly Charts which have hitherto appeared in the Annual Report, the only alteration made being that pressures are reduced to constant gravity (45°). The isobars are given for each twentieth of an inch. The arrows show the directions of the resultants 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 ⅕th 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. 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.

Ref. No 20, Wr., I.—Feb. 92.—415

Photo-litho. 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 51 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 name of the districts 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
3. Central do.
4. Upper do.
5. Arakan
6. Eastern Bengal
7. Assam (Surma)
8. Do. (Brahmaputra)
9. Deltaic Bengal
10. Central do.
11. North do.
12. Orissa
13. Chota Nagpore
14. Behar (South)
15. Do. (North)
16. North Western Provinces (East)
17. Oudh (South)
18. Do. (North)
19. North Western Provinces (Central)
20. Do. do. (West)
21. Do. do. (Submontane)
22. Punjab (South)
23. Do. (Central)
24. Do. (Submontane)
25. Do. (Hill Districts)
26. Do. (North West)
27. Punjab (West)
28. Malabar
29. Madras (South Central)
30. Coorg
31. Mysore
32. Konkan
33. Bombay Deccan
34. Hyderabad (North)
35. Khandeish
36. Berar
37. Central Provinces (West)
38. Do. (Central)
39. Do. (East)
40. Guzerat
41. Kattiawar
42. Sind
43. Central India (East)
44. Rajputana (East) Central India (West)
45. Rajputana (West))
46. East Coast (North)
46(a.) Do. do. (a)
47. Hyderabad (South)
48. Madras (Central)
49. East Coast (Central)
50. East Coast (South)
51. Madras (South)

GOVERNMENT OF INDIA.

METEOROLOGICAL DEPARTMENT.

MONTHLY WEATHER REVIEW,

PUBLISHED BY ORDER OF

THE GOVERNMENT OF INDIA.

CALCUTTA, OCTOBER, 1891.

INTRODUCTION.

THIS review of the weather in India during the month of October 1891 is based on observations taken daily at 8 A.M. at 162 stations, and on additional observations taken at 10 A.M. and 4 P.M. at 89 stations. The rainfall summary is based partly on the rainfall data of the meteorological observatories and the weekly rainfall telegrams sent to Simla by District Officers throughout India, and partly on the provincial rainfall statements of the month that have been received up to date. The meteorological data of the Bay of Bengal and the Arabian Sea which are collected at the ports of Calcutta and Bombay are also used, so far as is at present possible, in discussing the weather of India.

Summary of the chief features of the weather in India during the month of October 1891.

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 portion 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 very slight. The most important feature of the pressure distribution during the month is its approximate uniformity. Pressure is slightly higher in the

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interior than in the coast districts and is lowest in the Bay and 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 ranges between 75° (in the North Punjab) and 85° (in Central Rajputana), and the daily range of temperature from 28° in Upper Sind and West Rajputana to 10° in the coast districts of Bengal and Madras. The amount of aqueous vapour diminishes rather rapidly in amount 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 chiefly 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 uniform conditions of temperature and pressure of the month appear to be especially favourable to their growth, provided the humid south-west current in the south of the Bay is strong enough to ensure abundant supplies of aqueous vapour, the condensation of which undoubtedly supplies the motive power of the storm.

The following gives a brief statement of the more important features of the weather during the month of October 1891.

The meteorology of the month of October 1891 was in several respects very abnormal. The most noteworthy feature was the very early withdrawal of the south-west monsoon currents from North-Eastern India and the prevalence of continuous dry weather from the second week of October until the end of the year. Moderate occasional rain in October and November is necessary for the rice crops in Behar and Bengal, and the drought over a considerable portion of that area during this period hence caused a partial failure of the staple crops in several districts in these provinces. Another equally noteworthy and important feature was the unusually rapid transfer of the rainfall area from Northern India to Southern India accompanying the retreat of the south-west monsoon. Usually this retreat is a comparatively slow process, and the Deccan Circars and Ganjam generally receive moderate to heavy rain during the second half of October and the month of November In October 1891 the retreating south-west monsoon retreated suddenly in the second week of the month to the south of the Bay, and the pressure conditions initiated at this period were unfavourable to the advance of a humid current or of a cyclonic storm from the Bay across the north Madras coast. Hence the eastern districts of Hyderabad, Ganjam, the Circars and the Deccan received practically no rain during this period, and suffered more or less from drought. The abnormal meteorological features and conditions of the month and their relations to each other are hence of great interest.

October 1891 may be divided into five periods, each marked by special features. These are :—

1st.—From the 1st to the 4th, during which the monsoon currents continued to give general rain to Northern India.

2nd.—From the 5th to the 9th, during which the south-west monsoon humid currents retreated from Northern India.

3rd.—From the 10th to the 18th, during which Southern India received fairly general rain from the retreating south-west monsoon current, and dry weather obtained in Northern and Central India.

4th.—From the 19th to the 24th, during which a diffused disturbance gave unsettled squally weather with heavy rain to the Bay area. The rainfall in Southern India from the 19th to the 22nd was hence small in amount, but was followed by a heavy burst of rain in the South Coromandel coast districts on the 23rd and 24th.

5th.—From the 25th to the end of the month, during which dry weather prevailed over the whole of India, except South Madras and Malabar, which received moderate showers daily.

First period from the 1st to the 4th.—At the commencement of the month pressure was largely in defect in Upper India, and a depression covered the central districts of the North-Western Provinces. This was the continuation of a cyclonic storm, which was the chief feature of the weather of the last week of September. This depression passed into the eastern districts of the North-Western Provinces on the 2nd and into Central Behar on the 3rd. It filled up gradually during this period and finally disappeared on the evening of the 3rd. The North-Western Provinces and Behar received heavy general rain from the 1st to the 3rd. Whilst the storm was filling up, a moderate indraught of humid winds from the Bombay coast gave fairly general rain to the East Punjab and East Rajputana on the 3rd and 4th. Bengal, Burma and the northern and central districts of the Peninsula obtained local showers of little importance during the same period. In South India the rainfall was fairly heavy and general. During this period rain was received in all

districts except Sind and West Rajputana. It was heavy in the North-Western Provinces, moderate in Behar and South India and light in other districts.

Second period from the 5th to the 9th:—A rapid increase of pressure commenced in Northern India on the 4th, which reversed the directions of the gradients. Pressure oscillated rapidly for some time afterwards, but the final result was the establishment of high pressure and anticyclonic conditions in Upper India. These pressure oscillations and changes accompanied a very rapid change in the weather. Skies cleared in the Punjab, the North-Western Provinces and Rajputana on the 5th and 6th. Rain in moderate amounts continued to fall in Bengal until the 6th and in the Central Provinces and North Deccan until the 8th. On the 9th skies were clear or lightly clouded over the whole of India to the north of Lat. 18° N. Westerly winds set in over the Gangetic Plain on the 5th and 6th, and gradually extended eastwards into Behar on the 7th and West Bengal on the 8th. On the morning of the 9th light dry land winds prevailed over the whole of Northern India and the north of the Bay. The following data for different provinces of Northern India for the 4th, 9th and 10th show the change of conditions that occurred during this interval:—

DISTRICT.	Average amount of cloud at 8 A.M. of			Average amount of aqueous vapour at 8 A.M. of			Average humidity at 8 A.M. of		
	4th.	9th.	10th.	4th. "	9th.	10th. "	4th. %	9th. %	10th. %
Punjab . .	3·6	0	0·5	·564	·495	·499	77	62	62
Rajputana and Sind . .	2·0	2·2	0·3	·653	·537	·566	73	58	61
North-Western Provinces . .	5·5	0	0	·794	·595	·627	88	73	75
Central India and Guzerat . .	2·7	1·1	0·3	·767	·656	·649	85	69	67
Central Provinces and Berar . .	2·6	0·9	0·7	·770	·577	·587	84	71	75
Behar . .	8·5	2·5	2·8	·844	·638	·621	88	71	67
Bengal . .	6·9	2·2	2·4	·900	·780	·774	89	79	77

Third period from the 10th to the 18th October:—At the commencement of this period temperature was below the normal over the whole of India with the exception of Burma and Madras. The deficiency was large in the Central Provinces, Berar and the North-Western Provinces, in which areas it averaged nearly 4°, and was greater in the day than in the night temperature. The contrary was the case in Bengal, where the temperature was 2° below the normal. The variations were small in other districts. Fine clear weather obtained during this period over the whole of Northern and Central India and the North Deccan, and the deficiency of temperature in this area generally became smaller in amount from day to day.

Southern India, Malabar and the Konkan received daily rain during this period. The rain in many cases, more especially in the Konkan and Malabar, accompanied thunderstorms. The rainfall was moderate in amount from the 10th to the 13th or 14th, and again on the 17th and 18th. Some very heavy downpours were received on the 15th and 16th, more especially in the Nilgherries and Malabar. This rainfall caused a considerable temporary reduction of temperature in South Madras, Mysore and the Konkan. On the 18th temperature was normal or in slight excess in Burma, the North-Western Provinces, Rajputana, Sind and Central India, and was in moderate defect in other provinces by amounts averaging 1½° and ranging from 1° in Madras to 2° in Bengal and the Punjab.

Fourth period from the 19th to the 24th October:—Weather had been squally in the south-west of the Bay during the week previous to the 19th. It became rapidly unsettled with squalls and heavy rain over the south and centre of the Bay on the 19th and 20th, and there was a slight tendency to the formation of an area of depression between the Andamans and the Coromandel coast. It however failed to concentrate, and squally rainy weather extended northwards as far as Lat. 19° N. on the 21st and 22nd. The slight indraught to the depression gave north-west winds and dry weather on the North Coromandel coast on the 20th and 21st. A small shallow disturbance crossed that coast on the morning of the 23rd and broke up on that day without advancing far into the interior. South Madras, more especially the South Coromandel coast districts received heavy rain on the 22nd and 23rd; Malabar also obtained heavy rain on the same days. Weather improved rapidly during the next 24 hours, and the rainfall was small in amount. This rainfall caused a large reduction of temperature in South Madras, *e.g.*, the mean temperature of the 24th at Salem, and Bangalore was 6° below the normal. Temperature had increased relatively to the normal over the whole of Northern and Central India, and was now generally in excess. The excess was greatest in West Rajputana, where it averaged 4°. The unusually clear dry weather in Bengal and Burma, however, continued to give abnormally low night temperatures to those areas.

Fifth period from the 25th to the end of the month:—This period immediately preceded the formation and appearance of the cyclone which passed over Port Blair on the early morning of the 2nd November. Fine clear weather prevailed in Northern India and the north of the Peninsula from the 25th to the 30th. A very shallow depression appeared in Sind on the 26th, but filled up during the day, after giving a few light local showers in the Punjab. South Madras and Malabar received fairly general moderate rain on the 25th, 26th and 27th, but during the remainder of the month the rainfall was scattered and small in amount. The barometric changes were rather large, but were apparently of little importance, except that they gave excessive pressure over the whole of the Indian area. The excess on the 31st was greatest in the eastern half of the Peninsula. Temperature was generally above the average, but the variations were not large, except

in the West Deccan, where the mean temperature was 4° to 8° above the normal.

The mean pressure of the whole of India for the month was very considerably above the normal (+·035″). The excess differed considerably in different parts and was greatest in a belt of country stretching across from Orissa to Khandeish and the West Deccan, *i.e.*, over the northern half of the Peninsula, where it ranged below ·05″ and ·06″. It was least in South India and Burma. The belt of high pressure in the Deccan was very persistent and prominent during the latter half of the month and was directly related to the failure of the retreating south-west monsoon rains in North Madras and the Deccan.

The mean maximum or day temperature of October was considerably below the average in the East Punjab, North-Western Provinces, the eastern states of Central India and the Central Provinces (areas which had received excessive rain during the previous two months), and also in South Madras, which obtained heavier rain than usual during the month.

The minimum or night temperature was in defect in a belt of country stretching from Kathiawar and the Konkan to Burma, Bengal and Assam. The deficiency was greatest in Bengal, Khandeish and Berar, areas which were much drier and more free from cloud than usual during the month.

The variations of the mean temperature from the normal were small in amount over the greater part of India. Temperature was below the normal in the East Punjab, East Rajputana, the North-West Provinces, Central India, Berar, the Central Provinces, Bengal, Assam and Upper and Central Burma. The variations were less than 2° except in the South-East Punjab and the western and central districts of the North-Western Provinces, and were absolutely greatest at Agra (—3·2°) and Ludhiana (—3·1°). The mean temperature of the month was slightly above 2° in excess in the area of drought in Western Rajputana. The following table gives a summary of the temperature data for the eleven meteorological divisions of India :—

Division.	Variation of		
	Mean maximum temperature from normal.	Mean minimum temperature from normal.	Mean temperature from normal.
	°	°	°
Burma Coast and Bay Islands	+1·1	—0·7	+0·2
Burma Inland	+1·1	—5·0	—2·0
Assam	—0·5	—2·4	—1·5
Bengal and Orissa	+0·6	—2·0	—0·7
Gangetic Plain and Chota Nagpur	—0·6	—1·8	—1·2
Upper Sub-Himalayas	—4·7	+0·3	—2·2
Indus Valley and North-West Rajputana.	—0·7	+1·6	+0·5
East Rajputana, Central India and Guzerat.	—0·9	—0·1	—0·5
Deccan	—0·3	—1·2	—0·8
West Coast	+1·7	—0·7	+0·5
Southern India	—0·3	+0·1	—0·1

Winds were, as is usual in October, very light in the Gangetic Plain. The westerly winds of the month were however steadier than usual. Westerly winds also prevailed to an unusual extent during the greater part of the month in Behar and West Bengal. Winds were light and irregular in Central India and the Central Provinces. Easterly winds prevailed in the Deccan and northerly winds with an unusual amount of westing on the Coromandel coast. Northerly winds set in abnormally early in the month in Burma, and continued steadily during the remainder of the month.

The air was slightly damper in the Punjab and the western and central districts of the North-Western Provinces. It was somewhat drier in Rajputana and Sind. The amount of aqueous vapour and humidity were both very largely below the normal in Behar, Bengal and Assam. They were generally slightly in defect in the Peninsula, except in South Madras. The variations in the amount of cloud were similar in character to those of the humidity. The mean cloud amount was somewhat in excess in the Punjab and North-Western Provinces, and was very largely in defect in Behar, Bengal and Assam. The variations were smaller in the Peninsula. There was a moderate defect in the Deccan and a slight excess in South Madras. The following gives comparative data for the larger meteorological divisions :—

Division.	Variation of		Cloud Amount.	
	Aqueous vapour pressure from normal.	Relative humidity from normal.	Actual.	Variation from normal.
	Inch.	%		
Burma Coast and Bay Islands	—·009	— 3	4·5	—1·3
Assam	—·046	— 1	3·5	—0·9
Bengal and Orissa	—·077	— 8	3·2	—1·2
Gangetic Plain and Chota Nagpur	—·009	0	2·1	—0·6
Upper Sub-Himalayas	+·050	+10	1·7	+0·9
Indus Valley and North-West Rajputana.	+·016	+ 1	1·1	+0·4
East Rajputana, Central India and Guzerat.	+·048	+ 5	1·5	—0·3
Deccan	—·017	0	3·1	—0·9
West Coast	—·034	— 3	2·6	—1·4
Southern India	+·009	0	6·5	+0·4

The distribution of the rainfall of the month has been indicated in the previous remarks. The whole of Northern and Central India received a moderate burst of rain during the first week of the month. The rains ceased almost simultaneously (on the 6th and 7th) over nearly the whole of Northern and Central India. Hence, although the rains continued slightly beyond their normal period in Upper India, they terminated very early and prematurely in North-Eastern and Central India and the Central Provinces.

Hence the rainfall of the month was more or less considerably in defect over the whole of Northern and Central India, except the eastern districts of the Punjab and western districts of the North-Western Provinces.

Rain was falling in Southern India in the first week of the month, and it intensified considerably immediately after the rains ceased in Northern India, and heavy rain was received during the second week of the month. It continued to receive moderate showers during the remainder of the month. North and Central Madras and the Deccan also obtained occasional showers, chiefly during the first fortnight of the month.

The rainfall of the month was hence considerably in defect in North and Central Madras and the Deccan, and normal or in moderate excess in the southern districts of Madras.

The following table gives rainfall data for the month of the eleven meteorological provinces into which India is divided :—

Division.	Rainfall.		
	Rainfall of month.	Normal rainfall of month.	Variation from normal.
	Inches.	Inches.	Inches.
Burma Coast and Bay Islands	5·90	9·53	—3·63
Burma Inland	2·67	4·44	—1·77
Assam	3·30	4·49	—1·19
Bengal and Orissa	1·75	5·18	—3·68
Gangetic Plain and Chota Nagpur	1·68	2·81	—1·07
Upper Sub-Himalayas	1·57	0·49	+1·08
Indus Valley and North-West Rajputana.	0·02	0·12	—0·09
East Rajputana, Central India and Guzerat.	0·66	0·88	—0·11
Deccan	2·40	3·02	—0·41
West Coast	10·25	7·48	+2·23
South India	7·86	8·16	—1·06

Atmospheric Pressure.

The distribution of mean 8 A.M. pressure for October is shown by means of two charts. The first chart (Plate I) gives the distribution of the mean pressure of the month reduced to sea-level and to constant gravity (that of latitude 45°) by means of isobars drawn for differences of pressure of ·05″ or $\frac{1}{20}$th of an inch. The second chart (Plate II) gives the variations of the actual mean pressure from the normal pressure. These values are obtained from the barometric readings reduced for temperature only. A small chart, No. 4 of Plate III, shows the distribution of the monthly mean daily pressure and of the mean winds in the same form and manner as in the monthly charts given hitherto in annual reports on the meteorology of India. The data on which this chart is based are given in Table II. The pressure data used in this chart are, it should be noted, reduced to constant gravity (that of 45° Lat.) as well as to sea-level.

The more important barometric changes and movements during the month are fully described in the following statement of the barometric depressions of the month. The data that are chiefly used in this discussion are the 8 A.M. reduced observations and the variations derived from a comparison of these observations and the normal values given in Table I. The means in the third column are not only reduced or corrected to sea-level but also to constant gravity. The normal means are obtained, except in a few cases, from the observations of the period 1878-88, and in order that the means and variations may be strictly comparable, the means have been calculated for observations of the same period in all cases.

October is a month of transition from south-west monsoon conditions to north-east monsoon or trade wind conditions. The change is usually not fully completed over the whole Indian region until the middle or end of December. The baric gradients established by this change in the cold weather are opposite in direction to those which obtain in the rainy season. The month of October is hence a period of great uniformity of pressure and of light and variable winds over the Indian region. It is also a period of marked uniformity of temperature conditions over India.

Pressure is on the average of the month slightly higher in the West Deccan, Central India, Berar and the western districts of the Central Provinces. Over the remainder of India the mean range of pressure is less than ·05″. The charts of the Bay of Bengal for this month, prepared by Mr. Dallas, show an area of slightly deficient pressure over the centre of the Bay in this month. It is, however, doubtful how far this represents the normal pressure conditions of the month. It is probable that it, in part at least, represents the fact that the depressions and cyclonic storms of the month originate almost entirely in the centre of the Bay. An important meteorological feature of the months of September and October is the increase of pressure in Northern India. This increase is usually most rapid in North-Western India, and the phenomena appear to suggest that it commences in the north-west frontier and extends south and south-eastwards. The trough of low pressure, which is a prominent and important feature of the rains, is hence shifted southwards, but at the same time fills up. Its existence in October is very faintly indicated by the mean pressure data of the land stations. They suggest that its mean position is probably between the Circars Coast and the West Pegu Coast or the Andamans, but its position shifts considerably during the month. Its position, however,

varies greatly in different years, and depends upon the character of the pressure changes in the Burmese Peninsula as well as those in North-Western India and the Peninsula. The mean range of pressure over the Bay to the north of Lat. 8° N. is almost certainly less than ·02″ and probably less than ·01″, so that pressure is even more uniform over the Bay than the Indian land area.

The mean pressure of the whole of India for the month of October 1891 was ·035″ above the normal. Relatively to the general state pressure was locally in defect (or the pressure anomalies were negative) in the Punjab, Sind, Rajputana, the Peninsula to the south of Lat. 14° N. and Burma. The negative anomalies were small, except in Tenasserim, South Madras and Malabar, where they exceeded ·02″. They were absolutely greatest at the following stations:—Calicut (—·052″), Cochin (—·042″) and Colombo (—·042″). Pressure was locally in excess over the remainder of India, but the positive pressure anomalies were small, except in West Orissa, the Central Provinces, Berar and Khandeish, where they slightly exceeded ·02″. They were absolutely greatest at Akola (+·028″), Nagpur and Raipur (+·025″), Cuttack (+·030″) and perhaps Gopalpur (+·045″).

The mean distribution of the 8 A.M. pressure is shown in Plate I and of the mean pressure in Chart IV of Plate III. Pressure was highest in the western districts of the Central Provinces, Berar and Khandeish, in which areas the mean 8 A.M. pressure of the month slightly exceeded 29·95″, and was very uniform over the whole of North-Eastern India. Pressure was lowest in the Indian area across the Bay from Negapatam to Port Blair and Tavoy, averaging 29·86″ in this area or trough of minimum pressure in the Indian area. The mean range of the 8 A.M. pressure in the Bay slightly exceeded three hundredths of an inch.

It will thus be seen that the chief points of difference between the mean pressure distribution of October, 1891, and the normal were the following:—

1st.—Pressure was largely in excess in the Indian area, apparently indicating a more rapid establishment of cold-weather conditions than usual in North-Western India.

2nd.—The excess of pressure was greatest in the north of the Peninsula and smallest in the south of the Peninsula and the south of the Bay.

3rd.—The position of the trough of low pressure was hence removed to the south of the Bay much earlier than usual in the month, and on the average lay between the South Coromandel coast and the Andamans.

The meteorology of the month may be divided into five well-marked periods—

1st.—From the 1st to the 4th, when south-west monsoon winds prevailed over the whole of Northern India.

2nd.—From the 5th to the 8th, during which the humid winds of the south-west monsoon withdrew from Northern India.

3rd.—From the 9th to the 18th, during which Southern India received frequent rain, and fine dry weather obtained in Northern and Central India.

4th.—From the 19th to the 24th, when squally, rainy weather prevailed in the south and centre of the Bay.

5th.—From the 25th to the end of the month, when the weather conditions were similar to those of the third period.

The following gives an account of the pressure conditions during each of these periods:—

At the commencement of the month the distribution of pressure was such as usually obtains in September. Pressure was lowest in the South-West Punjab and highest in the West Deccan and south of the Bay. A shallow depression which was the continuation of the storm of the last week of the previous month covered the central districts of the North-Western Provinces and was determining heavy rainfall to that area. The following table of the mean pressure variation data of the 1st illustrates the chief features of the distribution of pressure at this time:—

PROVINCE.	Variation of mean pressure at province from the normal on 1st October.
	Inch.
Burma	+·065
Bengal	+·040
North-Western Provinces	—·050
Punjab	—·060
Rajputana	—·040
Central India	—·010
Central Provinces	+·030
Bombay	+·045
Madras	—·040

Pressure was most in excess across the Bay from the Circars to Lower Pegu, where it was ·08″ in excess.

The following observations define the storm on the 1st:—

STATION.	BAROMETER.			WIND.	
	Actual corrected to sea-level and constant gravity.	Change in preceding 24 hours.	Variation from normal of day.	Direction.	Average velocity during previous 24 hours, in miles per hour.
	Inches.	Inches.	Inches.		
Lucknow	29·699	—·028	—·097	E. S. E.	4
Agra	·772	+·045	—·029	N. E.	4
Cawnpore	·691	+·037	?	S. S. W.	5
Nowgong	·761	+·083	—·040	W.	3
Allahabad	·738	+·048	—·050	S. S. E.	4

The air movement in the Gangetic Plain was everywhere feeble, and was even less than the normal of the period in

the area of depression. The centre of the depression was a little to the west of Cawnpore. During the next 24 hours the depression shifted slowly eastwards, and the centre was near Allahabad at 8 A.M. of the 2nd.

The following observations define its position at this time :—

Station.	Barometer.			Wind		Amount of cloud.
	Actual corrected to sea-level and constant gravity.	Change in preceding 24 hours.	Variation from normal of day.	Direction.	Average velocity during previous 24 hours, in miles per hour.	
	Inches.	Inches.	Inches.			
Allahabad	29·796	+·058	+·004	W.	3	10
Gorakhpur	·869	+·073	+·068	E.	6	10
Lucknow	·847	+·148	+·041	N. E.	7	10
Sutna	·848	+·086	+·037	W.	7	8

A general increase of pressure had occurred during the previous 24 hours. The rise in the area of depression was greater than the average rise in Northern India, thus showing that the depression was filling up. Moderate rain had fallen in Behar and the eastern districts of the North-Western Provinces, but elsewhere little rain was falling.

The depression continued to fill up during the day, and on the morning of the 3rd a very shallow depression and diffused disturbance without any definite centre covered Behar and the eastern districts of the North-Western Provinces. The depression disappeared during the next 24 hours. Moderate rain was received in the area of depression on the 1st, 2nd and 3rd. Whilst this depression was filling up on the 3rd and 4th the depression in Upper Sind and the South-West Punjab intensified slightly and determined moderate indraught from the Arabian Sea, and general rain for a period of 48 hours to the East Punjab, East Rajputana, the western districts of the North-Western Provinces and Central India.

A rapid increase of pressure commenced on the afternoon of the 4th, which largely modified the pressure conditions and accompanied the withdrawal of the monsoon currents from North-Western India.

The following table gives the mean pressure in different parts of India on the 4th and 7th :—

Province.	8 A. M. : Average pressure.		
	4th.	7th.	Change from 4th to 7th.
	Inches.	Inches.	Inches.
Punjab	29·83	29·98	+·15
North-Western Provinces	·84	·96	+·12
Rajputana	·80	·98	+·18
Central India	·85	·97	+·12
Bengal	·86	·92	+·06
Central Provinces	·88	·97	+·09
Deccan	·88	·93	+·05
Southern India	·87	·90	+·03

The following table gives the average cloud amount at 8 A.M. of the 4th, 7th and 10th, and the average rainfall of the previous 24 hours, and indicates clearly the character of the great change of weather which occurred during the period from the 4th to the 10th :—

Province.	Average cloud amount at 8 A. M. of the			Average rainfall preceding 24 hours of the		
	4th.	7th.	10th.	4th.	7th.	10th.
				Inches.	Inches.	Inches.
Punjab	3·6	0	0·5	0·49	*Nil*	*Nil*
North-Western Provinces	5·5	1·5	0	0·08	*Nil*	*Nil*
Rajputana	1·7	0·6	0·6	0·01	*Nil*	*Nil*
Central India	2·7	4·1	0·3	0·05	0·35	0·01
Bengal	7·3	2·1	2·7	0·22	*Nil*	*Nil*
Central Provinces	2·9	4·2	0·6	0·05	0·26	*Nil*
Deccan	4·7	3·2	1·2	0·23	0·04	0·08
Southern India	7·4	5·3	5·4	0·89	0·36	0·43

The pressure changes in India from the 5th to the 9th were rather large and rapid, but they were apparently oscillatory, forming part of the general atmospheric movement establishing high pressure conditions in Upper and Central India, and were very slightly related to the actual weather. Showers were received in the Central Provinces, Berar and North Bombay until the 8th, after which date little or no rain fell to the north of Lat. 17° N. The south of the Peninsula (*i. e.*, South Madras and Malabar) received daily rain during the whole of the period from the 1st to the 9th. Fine clear weather prevailed in Northern and Central India from the 10th to the 18th. The Konkan, Malabar and South Madras received daily rain during the period, much of which fell during thunderstorms. South-west winds prevailed in the south-east of the Arabian Sea off the Malabar and Ceylon coasts, and weather was slightly unsettled with squalls. On the 18th and 19th pressure increased off the Konkan and Malabar coasts and decreased in the Bay, and a very shallow depression formed, which was the chief feature of the weather during the next five days.

Depression of the 19th to the 24th October.—The first indications of the formation of this depression were shown by the observations of the 19th. The barometer rose in every part of India, and was steady or falling in the Bay. A very shallow depression covered the south of the Bay between the Coromandel coast and the Andaman and Nicobar Islands. Winds were very light, ranging from force 0 to 2 over the greater part of the Bay. Weather was slightly unsettled and squally over the whole of the Bay to the south of Lat. 18° N. The following gives extracts from the loss of three hsips, showing the character

of the weather in different parts of the Bay at this period:—

VESSEL.	Hour.	POSITION. BAROMETER.			WIND		WEATHER.
		Lat. North.	Long. East.	Reduced to 32° and to Lat. 45° gravity.	Direction.	Force.	
				Inches.			
S.S. *Skelmorlie* .	8 A.M.	...	...	?	S	...	Very heavy squall.
(Course N. 18′ E.) .	Noon	15°59′	90° 24′	29·858	ESE	...	Threatening.
	4 P.M.	...	...	?	E	4	Overcast, slight sea.
S. S. *Fazilka* .	8 A.M.	...	...	·823	NNE	2	Showery.
(Course N. 24° E.) .	Noon	11°21′	83° 58′	·782	NNE	2	Rain; squally.
	8 P.M.	...	...	·802	NNE	2	Cloudy.
	Midt.	...	...	·800	NNE	4	Fine.
S. *Four Winds* .	8 A.M.	...	...	?	Variable	1	Fine and clear.
(Course N. 27° W.) .	Noon	9° 8′	90° 46′	?	E	2	Fine weather and passing clouds.

The preceding data show that weather was squally on the south and south-east of the Bay, and that the squalls were most severe to the north and north-west of the Andamans.

The barometer fell generally during the next 24 hours. The depression covered the same part of the Bay on the morning of the 20th, the centre being in about Lat. 10½° N. and Long. 88° E. The logs of ships show that weather was squally and disturbed over the whole of the Bay to the south of Lat. 20° N., and that the squalls were most severe and rainfall heaviest at very considerable distances to the north of the central depression. The disturbance was hence widely diffused and showed no signs of concentration. The following gives extracts from the logs of six vessels in different parts of the Bay:—

VESSEL.	Hour.	POSITION.		BAROMETER.	WIND		WEATHER DURING DAY.
		Lat. North	Long. East.	Reduced to sea-level at constant gravity, Lat. 45°.	Direction.	Force.	
				Inches.			
S.S. *Nirano* .	Noon	10° 13′	83° 22′	29·861	N	3	Moderate sea, cloudy.
S. *Four Winds* .	Noon	11° 17′	90° 45′	?	E	2	Squally, cloudy and showery.
S.S. *Skelmorlie* .	Noon	17° 24′	90° 48′	·878	E	2	Light unsteady winds.
S.S. *Glencona* .	Noon	14° 23′	91° 46′	·803	Variable SW to ESE	...	Increasing rain. Light to moderate breezes with heavy rain and squalls.
S.S *Fazilka* .	Noon	15° 17′	85° 18′	·791	NNE to ENE	...	Hard squalls; incessant rain during the day.
S. *William Turner*	Noon	18° 7′	87° 7′	?	NE to E	0 to 5	Squally with heavy rain.

Pressure gave way during the next 24 hours over the whole of India and the Bay by nearly equal amounts. The depression in the Bay was hence unchanged in character and position on the morning of the 21st. The barometer at the centre of the depression (probably in about Lat. 10° N. and Long. 87° or 88° E.) was not more than an eighth of an inch lower than it was at the Burma, Bengal and Orissa coast stations. The weather was as on the 19th and 20th unsettled and squally with more or less heavy rain over the greater part of the Bay south of Lat. 20° N. The winds indicated the existence of a feebly developed cyclonic circulation, but were very light, the great majority of vessels reporting variable or light to moderate winds.

The following extracts from the logs of four vessels indicate the character of the weather on the Bay on this day:—

VESSEL.	Hour.	POSITION.		BAROMETER.	WIND		WEATHER.
		Lat. North.	Long. East.	Reduced to sea-level at constant gravity, Lat. 45°.	Direction.	Force.	
				Inches.			
S.S. *Clan Mackintosh.*	8 A.M.	...	...	29·701	N	...	1-30 A.M., very heavy rain. Showery; sea smooth.
	Noon	10° 21′	81° 26′	·758	NNE	...	Frequent heavy showers.
	8 P.M.	...	...	·675	NE	...	Squally, heavy rain
S.S. *Argus* .	8 A.M.	...	...	?	ENE	...	Squalls and constant rain.
	Noon	15° 10′	85° 34′	·792	ENE	5	Constant heavy rain.
	8 P.M.	...	...	?	NE	6	Threatening appearance.
S. *Glencona* .	8 A.M.	...	...	?	Variable	...	Thick rainy weather.
	Noon	16° 0′	91° 41′	·833	SE	2	Ditto.
	8 P.M.	...	...	?	S	...	Fine and clear.
S.S *Fazilka* .	Noon	19° 55′	86° 44′	·835	N	2	Cloudy with rain, squally at times.

Weather was also squally with heavy rain off the Malabar coast in the Arabian Sea.

The barometer fell during the day by nearly equal amounts over the Indian land area and the Bay. The depression in the Bay was hence unchanged in character on the morning of the 22nd. The following gives the weather experienced by a number of vessels in the Bay on that day:—

SHIP.	POSITION AT NOON.		BAROMETER, 8 A.M.	WIND, 8 A.M.		WEATHER.
	Lat. North.	Long. East.	Reduced to sea-level at constant gravity, Lat. 45°.	Direction.	Force.	
			Inches.			
S.S. *Palamcotta* .	7° 52′	82° 34′	29·726	E	2	Fine and clear.
S. *Charles Dickens* .	13° 27′	89° 46′	·814	Variable	...	4 A.M., rain in torrents.
S.S. *Clan Mackintosh.*	At Madras		·678	Variable	...	Heavy rain.
S. *Four Winds* .	15° 18′	90° 50′	?	SW	2	Cloudy.
S.S. *Glencona* .	17° 12′	90° 59	·803	Variable	...	Squally with rain.
S.S. *Argus* .	18° 59′	87° 1′	·782	NE	4	Showery.
S.S. *William Turner*	18° 19′	88° 34′	?	ENE	...	Fine.

The barometer began to rise during the day, but the changes were everywhere small. The observations of the 23rd in South Madras indicate that a very shallow and feeble depression crossed the Coromandel coast on the morning of the 23rd. The following gives the 8 A.M. observations at stations in South Madras:—

Station.	Barometer, 8 A.M.			Wind		Rainfall previous 24 hours.
	Corrected and reduced to 32° and sea-level at constant gravity, Lat. 45°.	Change since previous day.	Variation from normal.	Direction, 8 A.M.	Velocity in miles per hour during previous 24 hours.	
	Inches.	Inch.	Inch.			Inches.
Nellore . .	29·766	—·020	?	NE	9	0·43
Madras . .	·739	—·040	—·143	ESE	11	1·26
Cuddalore .	·741	+·024	?	WNW	3	7·50
Trichinopoly .	·779	+·009	—·105	WNW	8	3·41
Negapatam .	·762	+·035	—·108	WNW	6	1·16

These observations show clearly that a shallow depression was crossing the coast between Madras and Cuddalore at that hour. The observations taken on boardships are not sufficiently numerous to indicate whether this was the continuation of the depression which had been in the centre of the Bay and which had been either stationary or moving very slowly westwards during the previous three days, or whether it was a small subsidiary depression which had formed during the previous 24 or 36 hours. The latter appears to be the more probable supposition. Heavy rain had fallen in South Madras and Malabar during the previous 24 hours.

The weather was practically unchanged over the greater part of the Bay. Light and very irregular winds prevailed and weather was squally and rainy. The following gives 8 A.M. observations on boardships in different parts of the Bay on the 24th:—

Vessel.	Position at noon.		Barometer.	Wind		Weather.
	Lat. North.	Long. East.	Reduced to sea-level at constant gravity, Lat. 45°.	Direction	Force.	
			Inches.			
S.S. *Borghese* .	9° 43′	83° 15′	29·902	Calm	0	Fine.
S. *Tasmania* . .	13° 46	91° 21	·816	Variable	1	Fine.
S.S. *Palamcotta* .	14° 59	85° 32	·826	Variable	...	Sea smooth.
S. *Four Winds* .	18° 30′	90° 22	·829	NNE	2	Fine and clear.
S. *Skelmorlie* .	20° 42′	88° 27	·938	N	2	Fine.

The depression hence filled up and disappeared in the course of the 23rd and 24th. Pressure increased over the whole Indian area, the rise being greater in South Madras and the south-west of the Bay than elsewhere. On the 24th pressure was slightly lower in the south-west of the Bay than elsewhere, and westerly winds were blowing generally in South Madras. Rain hence ceased to fall except in light local showers in South India.

A shallow depression appeared in Sind and West Rajputana on the 26th, but it disappeared during the next 24 hours after giving some cloud and light local showers in Upper India. A second shallow depression appeared in the same area on the 29th. It filled up on the 30th, and pressure increased rapidly during the next 24 hours, thus re-establishing high pressure or anticyclonic conditions in Upper India. During the whole of this period, from the 26th to the 30th of the month, Southern India, south of Lat. 12° or 13° N., received frequent light to moderate showers. The 31st was practically rainless in Southern India. The pressure conditions on that day were such as usually accompany fine weather in India in October. Pressure was normal in Southern India, and considerably in excess in North-Western and Central India, and steepish gradients obtained in the north of the Bay. Pressure was very uniform over the southern half of the Bay, and weather was squally with light and unsteady southerly winds.

Summary of Special Storm Reports.

Cyclonic storms are of occasional occurrence in October, and are sometimes of exceptional severity. No cyclonic storm was generated in the Bay of Bengal during the month under discussion. Thunderstorms are of frequent occurrence durring the month, more especially in those areas which receive their final burst of south-west monsoon rain at this time. As a rule, little or no thunder occurs in the areas of frequent and steady rain during the south-west monsoon, but the rains frequently commence and terminate with series of thunderstorms in different parts of India, which are sometimes of exceptional violence.

Thunderstorms appear to have been less frequent than usual in October 1891. Malabar and the Konkan had, however, frequent and in some cases very heavy thunderstorms during the period from the 10th to 18th. The following gives a brief statement of the chief thunderstorms reported by observers during the month:—

4th.—Thunderstorm at Belgaum from 3-20 to 4 P.M.

5th.—Thunderstorm at Belgaum with strong winds from 3 to 4 P.M. Thunderstorm at Akola from 7 to 9 A.M.

6th.—Thunderstorm with heavy rain at Akola from 6-30 to 7-15 P.M.

7th.—Thunderstorm at Poona from 4 to 7 P.M.

16th.—Duststorm with thunder and lightning at Ajmere. Slight rain fell during the storm from 4-30 to 5 P.M.

22nd.—Thunderstorm at Lahore.

23rd.—Thunderstorm at Pedong from 5 to 6 P.M. During the next three days snow fell on the Sikkim Himalayas down to an elevation of 12,000 feet.

26th.—Thunderstorm at Karwar from 4 to 5 P.M. Temperature fell from 84° at 4 P.M. to 75·6° at 4-30 P.M Barometer was steady throughout. The strongest winds were of average velocity, 20 miles per hour.

29th.—Duststorm at Bushire from 9-45 A.M. to noon. Storm came down from north-east. No rain fell during the storm. Strongest winds, 34 miles per hour.

Weather in the Bay of Bengal and Arabian Sea.

Bay of Bengal.—At the commencement of the month light variable winds (force 1 to 3) prevailed over the whole of the Bay, excepting in the south and south-east, where weather was squally with moderate west to west-south-west winds. Winds became lighter in the north of the Bay during the next three or four days, and on the 5th light airs and calms obtained in the north and centre of the Bay. Occasional heavy rain showers were experienced at this time in different parts of the Bay. For example, the ship *Duchess of Edinburgh*, in Lat. 14° 10′ N. and Long. 89° 52′ E. on the 7th, had light variable airs and very heavy rain in the morning. The S.S. *Ramore Head*, in Lat. 10° 21′ N. and Long. 95° 54′ E. on the 10th, had heavy rain squalls.

Light north-north-east to north-east winds set in at the head of the Bay on the 8th and extended rapidly southwards. Light to gentle north-east breezes or variable airs obtained over the north and centre of the Bay on the 9th and 10th. On the 11th light north-east winds prevailed over the greater part of the Bay. Strongish south-west winds continued off the Ceylon coast, and weather was squally there and in the south of the Bay generally. No change occurred during the next few days except that the north-east winds appeared to strengthen steadily. North-east winds (force from 1 to 4) prevailed on the 16th over the north and west of the Bay. Weather was also more squally in the south and south-east of the Bay. The ship *Skelmorlie*, in Lat. 15° 59′ N. and Long. 90° 29′ E. on the 19th, had south winds and very heavy squalls. The weather became more unsettled and squally during the next four days, and the majority of vessels in the south and centre of the Bay reported squalls with more or less heavy rain. The S.S. *Glencona*, in Lat. 16° 1′ N. and Long. 91° 41′ E. on the 21st, had thick rainy weather. The S.S. *Clan Mackintosh*, in Lat. 10° 21′ N. and Long. 80° 26′ E. on the 21st, had very heavy rain, and on the 22nd, when off Madras, had torrents of rain. During this period light north-east or variable winds with clear weather obtained in the north of the Bay.

Weather improved on the 25th. Light to moderate north-east winds obtained during the remainder of the month over the greater part of the Bay. Weather was squally off the Coromandel coast, and moderate but somewhat unsteady south-west to south-east winds prevailed in the south-east of the Bay.

Arabian Sea.—Light, unsteady, and variable winds prevailed over the greater part of the Arabian Sea at the beginning of the month. Weather was squally in the south and south-east off the Malabar coast. Thus the S.S. *Argus*, in Lat. 18° 19′ N. and Long. 76° 59′ E. on the 4th, had frequent hard squalls from the west-north-west (force 6). On the 5th light north-east or variable winds obtained to the north of Lat. 12° N. The winds increased in force on the 6th and 7th, and on the 8th the S S. *Indrapura*, in Lat. 15° 54′ N. and Long. 57° 52′ E., had fresh easterly winds and occasional heavy rain squalls, and the S.S. *Egremont Castle*, in Lat. 15° 24′ N. and Long. 58° 42′ E., had hard squalls. Similar weather was experienced for some days in this part of the Arabian Sea. On the 13th light to moderate north-east monsoon winds obtained over the Arabian Sea to the north of Lat. 9° or 10° N. Further south winds were very unsteady and weather was showery. Off the Malabar coast weather continued squally with frequent rain. Thus, the S.S. *Cathay*, in Lat. 8° 27′ N. and Long. 76° 23′ E. on the 16th, had squally weather and continuous heavy rain during the day, and the *Lorna Doone*, in Lat. 10° 24′ N. and Long. 68° 14′ E., had variable winds with heavy squalls. North-east winds, force 2 to 4, prevailed over nearly the whole of the Arabian Sea to the north of Lat. 8° N. during the third week of the month, and weather was fine except off the Malabar and West Ceylon coasts, where it was squally and showery. Strong east-north-east winds (force 6) were experienced by the S.S. *Netherley Hall* in the Gulf of Aden on the 17th.

No important change appears to have occurred in this sea area during the remainder of the month. Weather continued squally with unsteady winds off the Malabar and Ceylon coasts, and probably in and to the north of the equatorial belt, but was fine with light to moderate winds in the centre and north of the Arabian Sea.

The wind data of the first six days of the month indicate that the winds shifted rather rapidly from west through west-north-west and north-west to north and north-east, when the south-west monsoon current retreated from the north and central area (between Socotra and Bombay) of the Arabian Sea.

Temperature of the Air.

The distribution of temperature in India for October 1891 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 data by means of which these charts have been prepared are given in Table I. The mean maximum and minimum temperatures have been obtained for each station from the observations of the same number of years, *viz.*, 1878 to 1888. 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 amounts which vary from month to month. But the variation of the mean daily temperature from the normal, as determined by the use of this definition, agrees in almost all cases closely with the variation as determined by the use of true daily means based on readings at 16 hours, in addition to those 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.

The temperature conditions of the month of October were very strongly marked. As will be presently seen, they were determined partly by the distribution of rainfall of the previous two months, and partly by the rainfall of he month itself.

The mean maximum or day temperature of the month was in defect in the Punjab, the North-Western Provinces, East Rajputana, Central India, the Central Provinces and South Madras. The deficiency exceeded 2° over the East Punjab and the North-Western Provinces, and was more than 5° at the following stations :—

Rawalpindi	—5·5°
Agra	—5·2°
Murree	—5·4°
Delhi	—6·2°

It exceeded 2° at Madura (—4·3°), Coimbatore (—2·3°) and Trichinopoly (—2·9°) in South Madras.

The mean maximum temperature of the month was more than 2° above the normal in West Rajputana the Central Deccan and Konkan. The following gives data for these areas :—

Province.	Station.	Mean maximum temperature. Actual, October 1891.	Normal, October.	Variation from normal.
		°	°	°
West Rajputana	Deesa	99·6	96·0	+3·6
	Ajmere	94·2	91·5	+2·7
Central Deccan	Bellary	92·3	89·7	+2·6
	Secunderabad	89·1	87·0	+2·1
Konkan	Ratnagiri	90·6	88·1	+2·5
	Karwar	87·5	85·0	+2·5

The mean minimum or night temperature was in defect in a belt of country stretching from the Konkan and Kathiawar to Bengal, Assam and Burma, and in excess in other districts. The deficiency exceeded 2° in Khandeish, West Berar, Assam, North Behar and North and East Bengal, and was more than 4° in the area represented by the following stations :—

Station.	Mean minimum temperature. Actual, October 1891.	Normal, October.	Variation from normal.
	°	°	°
Purneah	66·0	71·3	—5·3
Dinajpur	68·3	73·3	—5·0
Darbhanga	69·2	73·7	—4·5

The excess in the remaining districts was generally small in amount and was less than 2°, except at the following stations in the South-West Punjab, West Rajputana and Upper Sind :—

Station.	Mean minimum temperature. Actual, October 1891.	Normal, October.	Variation from normal.
	°	°	°
Sirsa	65·1	62·7	+2·4
Mooltan	67·0	64·7	+2·3
Jacobabad	65·5	63·4	+2·1
Ajmere	65·1	63·1	+2·0

The variations of the mean maximum and minimum temperatures of the month were either of opposite signs or were very small in amount, except in West Rajputana, where the rains had failed during the previous monsoon months.

The mean temperature of the month was below the normal in the East Punjab, East Rajputana, the North-Western Provinces, Central India, Berar, the Central Provinces, Behar, Bengal, Assam, Burma and South Madras. The deficiency was less than 2° except in three areas, *viz.* :—

1st.—The East Punjab and the western and central districts of the North-Western Provinces.

2nd.—A portion of North Behar.

3rd.—Madura in South Madras.

It was greatest in the first area at Agra (—3·2°), Ludhiana (—3·2°) and Rawalpindi (—2·9°). The deficiency was absolutely greatest at the adjacent hill stations, *viz.*, Murree (—4·7°) and Mussooree (—3·8°).

The mean temperature of the month was in excess in the Deccan, Bombay, Sind and West Rajputana. The variations were small, except in the East Deccan, where they were slightly above 1°, and in West Rajputana, at Deesa, (+2·6°) and Ajmere (+2·4°).

The following gives a brief statement of the more important changes of the temperature conditions during the month.

At the commencement of the month the temperature conditions were determined almost entirely by the rainfall distribution of the previous two months, temperature being in excess in the regions of deficient rainfall, and in defect where the rainfall had been more or less in excess. The following gives the variations in different provinces on the 1st :—

District.	Variation of			Average amount of cloud at 8 A.M.
	Mean maximum from normal of 1st.	Mean minimum from normal of 1st.	Mean temperature from normal of 1st.	
	°	°	°	
Burma	+1·5	+0·1	+0·8	7·3
Bengal and Assam	—0·6	+0·1	—0·3	4·3
North-Western Provinces	—7·4	—0·6	—4·0	6·0
Punjab	—0·9	+2·1	+0·6	0
Bombay	+1·4	—1·7	—0·2	1·4
Central Provinces	—5·6	—1·6	—3·6	5·0
Guzerat and Central India	—4·7	+0·5	—2·1	6·4
Sind and Rajputana	+0·6	+2·1	+1·4	2·8
Madras	+0·5	+0·3	+0·4	4·8

The deficiency was large in the North-Western Provinces, Central India and the Central Provinces, and was, as might be expected, much greater in the day than in the night temperature. The Punjab and Northern India generally received a brief general burst of rain on the 4th and 5th, which caused a large reduction of temperature in North-Western India. The following gives variation data of the 5th, the last day of fairly general rainfall in Northern India, due to the south-west monsoon of 1891 :—

District.	Variation from the normal of mean.			Average amount of cloud at 8 A.M. of 5th.
	Maximum temperature of 5th.	Minimum temperature of 5th.	Daily temperature of 5th.	
	°	°	°	
Burma	+1·6	—0·3	+0·7	3·6
Bengal and Assam	—1·5	—0·9	—1·2	6·0
North-Western Provinces	—6·2	—0·9	—3·6	3·2
Punjab	—11·9	—2·4	—7·2	1·3
Bombay	—0·1	—0·7	—0·4	7·9
Central Provinces	—1·9	+1·0	—0·5	6·1
Guzerat and Central India	—4·1	—2·0	—3·1	1·6
Sind and Rajputana	—4·8	—2·9	—3·9	0·1
Madras	—1·5	+0·7	—0·4	4·8

The south-west monsoon currents withdrew very rapidly from Northern India during the next two days, and fine clear weather with light variable or westerly winds were established in the Gangetic Plain and Central India on the 7th and 8th. At the same time general rain commenced in South and Central Madras, Mysore, Malabar and Konkan, and continued until the 18th. Hence temperature tended to increase during this period in Northern and Central India, where clear dry weather prevailed and was steadily below the normal in Southern India. The following gives variation data of the 18th, a day which is fairly typical of this period from the 9th to the 18th :—

District.	Variation from the normal of mean.			Average amount of cloud at 8 A.M. of 18th.
	Maximum temperature of 18th.	Minimum temperature of 18th.	Daily temperature of 18th.	
	°	°	°	
Burma	+0·3	—0·5	—0·1	5·5
Bengal and Assam	+0·5	—4·1	—1·8	0·8
North-Western Provinces	—1·3	+1·4	+0·1	1·2
Punjab	—4·5	+0·7	—1·9	0·5
Bombay	+0·3	—3·2	—1·5	5·6
Central Provinces	—0·3	—2·2	—1·3	0·1
Guzerat and Central India	+1·0	—0·1	+0·5	0
Sind and Rajputana	+0·5	+2·3	+1·4	2·3
Madras	—0·9	—1·0	—1·0	5·2

The most noteworthy features of this period were—

1st.—Unusually low night temperature in Bengal and Behar, due to abnormally dry weather and clear skies and the unusual prevalence of westerly winds.

2nd.—Abnormally low day temperature in the Punjab

The following table gives data in illustration of these two features :—

DATE.	Variation of maximum temperature from normal in Punjab.	Variation of minimum temperature from normal in Bengal.
	°	°
9th	—3·4	—3·1
10th	—2·5	—3·2
11th	—4·5	—2·7
12th	—6·0	—2·4
13th	—3·8	—3·0
14th	—3·7	—3·2
15th	—3·0	—3·6
16th	—1·7	—4·5
17th	—2·0	—4·3
18th	—4·5	—4·1
Mean	—3·5	—3·4
Average cloud at 8 A.M. for the period 9th to 18th.	0·9	1·6

The preceding data show that the peculiar features in question were even more marked at the end of the period than at the beginning, and were very persistent throughout the whole period.

3rd.—Steady deficiency of temperature (both day and night) in the North-Western Provinces and Central Provinces. The deficiency was greatest in the day temperature.

The following data give the variation of the maximum temperature from the normal during this period in these two provinces :—

DATE.	VARIATION OF MAXIMUM TEMPERATURE FROM THE NORMAL IN THE	
	N.-W. Provinces.	Central Provinces.
	°	°
9th	—4·1	—3·6
10th	—3·8	—3·8
11th	—3·2	—3·0
12th	—3·5	—2·9
13th	—3·0	—3·2
14th	—1·9	—2·5
15th	—1·8	—2·3
16th	—1·2	—2·4
17th	—0·2	—1·6
18th	+0·1	—1·3

These figures show that the variation of the maximum temperature from the normal diminished with approximate steadiness during this period.

During the next week, *i.e.*, from the 19th to the 24th, weather was disturbed and squally in the centre and south of the Bay. A shallow depression covered the south-west of the Bay. It failed to concentrate, and gave north-west winds to North and Central Madras, and the rainfall was hence small in amount except at the coast stations of Malabar and South Madras, which obtained moderate amounts. The disturbance gave moderate cloud to the whole of the province, whilst dry clear weather continued in Northern India. The following variation data of the 23rd are typical of this period :—

PROVINCE.	VARIATION OF			CLOUD AMOUNT.
	Mean maximum from normal.	Mean minimum from normal.	Mean from normal.	
	°	°	°	
Burma	—3·3	—0·8	—2·1	4·9
Bengal	—0·3	—2·6	—1·5	1·8
North-Western Provinces	—2·3	—1·2	—0·6	0·1
Punjab	—5·9	+2·0	—2·0	0
Rajputana	+3·7	+4·5	+4·1	0·7
Central India	+1·8	+0·7	+1·3	0
Central Provinces	—1·0	—3·5	—2·3	3·3
Bombay	+1·5	—5·7	—1·1	5·5
Madras	—4·0	—1·8	—2·9	7·0

The chief features of this period were :—

1st.—Excessive temperature in Sind, Rajputana and Beluchistan. The following data for three stations illustrate this feature :—

DATE.	VARIATION OF MEAN TEMPERATURE FROM NORMAL AT		
	Deesa.	Quetta.	Jacobabad.
	°	°	°
20th	+4·5	+5·4	+2·2
21st	+4·9	+6·3	+7·2
22nd	+3·2	+8·7	+7·1
23rd	+5·2	—0·5 (?)	+4·6
24th	+5·5	+2·2	+2·5

2nd.—Decreased temperature, more especially at night, in the Central Provinces, North Deccan, East Bengal and Assam. This was chiefly exhibited in the night temperatures. The following gives data in illustration :—

DATE.	BENGAL.		CENTRAL PROVINCES.	
	Variation of mean minimum temperature from normal.	Cloud amount.	Variation of mean minimum temperature from normal.	Cloud amount.
	°		°	
19th	—3·7	1·4	—2·8	0·5
20th	—3·0	2·4	—2·8	0·1
21st	—2·5	3·9	—3·8	0·2
22nd	—2·5	3·2	—4·5	0
23rd	—2·6	1·8	—3·5	3·3
24th	—2·7	2·2	—0·7	2·9

During the last week of the month, *i.e.*, from the 25th to 31st, dry clear weather obtained over the whole of Northern and Central India and the North Deccan. South Madras and Malabar obtained frequent light to moderate

showers. The temperature conditions of this period are represented fairly by the variation data of the 25th given in the following table:—

District.	Variation of		
	Mean maximum temperature from the normal of 25th.	Mean minimum temperature from the normal of 25th.	Mean temperature from the normal of 25th.
	°	°	°
Burma	−0·1	−2·4	−1·3
Bengal	+0·8	−2·4	−0·8
North-Western Provinces	−0·3	+2·2	+1·0
Punjab	−3·1	+1·9	−0·6
Bombay	+1·4	−0·9	+0·3
Central Provinces	+1·9	+0·6	+1·3
Guzerat and Central India	+3·1	+0·9	+2·0
Sind and Rajputana	+2·0	+2·7	+2·4
Madras	−1·2	+0·7	−0·3

The most noteworthy feature was the excessive temperature in the Central Provinces; the high temperature in Rajputana and Central India had now extended south and east to the North-Western Provinces and Central Provinces. The following gives data:—

Date.	Variation of mean temperature from normal in		
	Rajputana.	Central India.	Central Provinces.
	°	°	°
25th	+2·4	+2·0	+1·3
26th	+4·1	+2·1	+2·8
27th	+3·1	+3·2	+3·6
28th	+1·3	+3·4	+4·5
29th	−1·3	−1·1	+3·0
30th	−0·1	−2·4	−0·2
31st	+0·2	−1·4	−1·5

Temperature was also largely in excess in the drought area in the Deccan, as is indicated by the following data:—

Date.	Variation of mean temperature of day from normal at
	Sholapur.
	°
31st	+4·2
30th	+6·7
29th	+4·6
28th	+2·9
27th	+4·4
26th	+4·7

The following table gives the variation of the mean temperature week by week during the month from the normal in the larger provinces, and shows at a glance the more important temperature changes during the month:—

Province.	Difference of mean temperature from normal for week ending October				Difference of mean temperature from the normal for the month.
	10th.	17th.	24th.	31st.	
	°	°	°	°	°
Burma	+0·7	+0·7	−0·6	−0·8	+0·2
Bengal and Assam	−1·0	−1·4	−1·4	−0·1	−0·9
North-Western Provinces and Oudh	−3·5	−2·1	−0·5	−0·7	−1·9
Punjab	−4·5	−1·3	−0·2	−0·4	−1·3
Bombay	+0·2	−0·4	−1·1	+1·8	+0·1
Central Provinces and Berar	−2·4	−2·6	−1·8	+1·9	−1·3
Guzerat and Central India	−1·8	−0·6	+0·8	+0·8	−0·4
Sind and Rajputana	−1·4	+0·2	+2·6	+1·4	+0·8
Madras	0	+0·1	−1·2	+0·3	−0·1

Winds.

The mean wind directions at 8 A.M. during the month are shown in Plate I by arrows flying with the wind. They are obtained by the use of Lambert's formula, in which equal value is given to every wind. The data are given in Table I. The mean wind directions derived from the wind observations at 10 A.M. and 4 P.M. are given in the small chart (No. IV of Plate III) by means of arrows flying with the wind. The data for these will be found in Table II, together with the normal directions as obtained from the observations of the past 10 to 20 years.

Winds were even more irregular and unsteady than usual in October in the Punjab. They were stronger and steadier in Rajputana and had a very strongly marked westerly component. The abnormal westing of the winds was most conspicuous at Mount Abu, where the mean wind direction of the month was N. 51° W., the normal being N. 14° E.

Light westerly winds usually prevail in the North-Western Provinces, and variable winds in Bengal and Behar, the winds being most unsteady and changeable in Behar. In October 1891 westerly winds set in over the Gangetic Plain in the second week of the month and rapidly extended eastwards into Bengal and prevailed with abnormal steadiness during the remainder of the month. Winds were hence generally stronger and were much steadier than usual in this part of India, the increased steadiness being most marked in Behar. The following gives data for representative stations:—

Province.	Station.	Mean Direction.		Mean Steadiness.		Total daily Wind Velocity in miles.	
		Actual.	Normal.	Actual.	Normal.	Actual.	Normal.
				%	%		
North-Western Provinces	Allahabad	N 57° W	N 42° W	34	13	43	41
Behar	Patna	N 79° W	N 21° E	21	4	52	45
Bengal	Berhampore	N 65° W	N 12° W	47	16	47	51
	Saugor Island	N 32° W	N 10° E	43	13	199	156

The data show fully the very marked westing of the winds during the month.

Winds were even more abnormal in Burma, where southerly winds generally continue until nearly the end of the month. In October 1891 the southerly winds withdrew at the end of the second week of the month and were replaced by northerly winds, similar to those which prevail during the cold-weather months. Winds were on the whole steadier and stronger than usual, but the mean wind directions of the month differed very largely from the normal, *e.g.*—

Station.	Mean Wind Direction.		Total daily Wind Velocity in miles.	
	Actual, October 1891.	Normal, October.	Actual.	Normal.
Rangoon	N 31° W	S 46° E	72	76
Akyab	N 28° E	S 35° E	60	58
Mergui	N 4° E	S 79° W	52	35
Port Blair	S 69° E	S 5° W	99	149

Hence north-east winds set in over the east of the Bay and the North Andaman Sea at least a fortnight or three weeks earlier than usual.

Winds were very light and irregular in Central India and the Central Provinces. They were generally more unsteady and weaker than usual, and the mean wind directions in several cases were from opposite directions at neighbouring stations. The following data for two pairs of stations illustrate these features :—

Station.	Mean wind direction, actual.	Mean Steadiness.		Total daily Wind Velocity in miles.	
		Actual.	Normal.	Actual.	Normal.
		%	%		
Khandwa	N 17° E	43	28	50	69
Hoshangabad	S 29° W	18	25	62	38
Jubbulpore	N 19° E	14	17	29	50
Saugor	S 70° W	42	45	41	64

In the Deccan winds were steadier and stronger than usual and were more easterly than usual. The following data illustrate the chief features of the winds in this area :—

Station.	Mean Direction.		Mean Steadiness.		Total daily Wind Velocity in miles.	
	Actual.	Normal.	Actual.	Normal.	Actual.	Normal.
			%	%		
Sholapur	N 76° E	N 50° E	65	30	183	185
Poona	N 82° E	N 38° E	55	17	161	139

Humidity and Cloud.

The hygrometric data for 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 the minimum of the 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 *Vade-Mecum*, which are 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 5 to 20 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 computed are the means for periods varying from 5 to 25 years of the available cloud data for the same hours.

The air was much damper than usual in the Punjab, East Rajputana and North-Western Provinces. The amount of aqueous vapour present in the air was considerably in excess, and temperature was more or less below the normal. Hence the mean humidity of the month was largely above the average. The following gives data for stations at which the excess was greatest :—

Province.	Station.	Mean Aqueous Vapour pressure.			Mean Humidity.		
		Actual.	Normal.	Variation from normal.	Actual.	Normal.	Variation from normal.
		"	"	"	%	%	%
Punjab	Chamba	·391	·338	+ ·053	68	54	+ 14
	Lahore	·476	·453	+ ·023	56	47	+ 9
East Rajputana	Jeypore	·463	·423	+ ·040	49	45	+ 4
North Western Provinces	Meerut	·579	·497	+ ·082	70	57	+ 13
	Agra	·604	·489	+ ·115	63	49	+ 14
	Lucknow	·660	·572	+ ·088	71	61	+ 10

There was much less vapour in the air on the average of the month in Behar and Bengal. The deficiency was greatest in Central and East Bengal. As temperature was normal or slightly above the average, the mean humidity of the month was very considerably below the

average. The following gives data for representative stations:—

Province.	Station.	Mean Aqueous Vapour Pressure.			Mean Humidity.		
		Actual.	Normal.	Variation.	Actual.	Normal.	Variation from normal.
		"	"	"	%	%	%
Behar	Darbhanga	·676	·766	—·090	69	76	— 7
Bengal	Burdwan	·684	·795	—·111	67	75	— 8
	Calcutta	·734	·842	—·108	71	83	—12
	Dacca	·731	·854	—·120	71	80	— 9

The amount of aqueous vapour was also in defect but to a much smaller extent in Assam, Orissa and Chota Nagpur. It was also considerably in defect in Burma and Bombay as in Bengal. It was also in defect in the Central Provinces, but the variations were very irregular. Several stations at which the rainfall had been most excessive during the previous two months (*e.g.*, Jubbulpore and Saugor) show a slight excess. The following gives data for stations in Bombay, the Central Provinces and Burma, at which the deficiency was greatest:—

Province.	Station.	Mean Aqueous Vapour Pressure.			Mean Humidity.		
		Actual.	Normal.	Variation.	Actual.	Normal.	Variation.
		"	"	"	%	%	%
Berar	Buldana	·474	·546	—·072	54	61	—7
Bombay	Poona	·496	·555	—·059	55	59	—4
	Bombay	·793	·843	—·050	74	80	—6
Central Provinces	Chanda	·636	·690	—·054	68	71	—3
	Pachmarhi	·439	·448	—·009	54	63	—9
Burma	Diamond Island	·837	·875	—·038	80	84	—4

The amount of vapour in the air and the humidity percentage decreased on the whole fairly steadily from the beginning to the end of the month. The following average data for the 1st and 31st show the extent of the change which occurred during the month, and which accompanied and followed the withdrawal of the monsoon currents from Northern and Central India:—

Province.	Average Aqueous Vapour Pressure.			Average Humidity.		
	1st.	31st.	Difference.	1st.	31st.	Difference.
	"	"	"	%	%	%
Punjab	·730	·389	—·341	69	62	— 7
North-Western Provinces	·820	·502	—·318	90	76	—14
Bengal and Assam	·922	·646	—·276	85	79	— 6
Burma	·905	·790	—·115	90	82	— 8
Sind and Rajputana	·734	·387	—·347	71	54	—17
Central India	·797	·420	—·377	85	51	—34
Central Provinces	·774	·434	—·340	89	61	—28
Bombay	·803	·715	—·088	83	70	—13
Madras	·831	·751	—·080	79	81	+ 2

The average cloud amount of the month was more or less in excess of the normal in the Punjab, Sind and the western districts of the North-Western Provinces. The following gives data for representative stations:—

Province.	Station.	Cloud Amount.		
		Mean actual.	Mean normal.	Variation from normal.
Punjab	Murree	4·2	2·1	+2·1
	Peshawar	2·6	1·4	+1·2
	Lahore	1·0	0·7	+0·3
North-Western Provinces	Ranikhet	3·5	1·6	+1·9
	Meerut	1·4	0·7	+0·7
Sind	Hyderabad	1·2	0·4	+0·8

This excess was almost entirely due to the cloudy and disturbed weather of the first week of the month in Upper India. The cloud amount was normal or slightly below the average in the eastern districts of the North-Western Provinces, and was very largely in defect in Behar, Chota Nagpur, Bengal and Burma, and moderately in defect in Assam and Orissa. Skies are usually more or less clouded throughout the month, but in October 1891 fine clear weather with cloudless skies prevailed during the greater part of the month, more especially from the 10th to the 20th, and again from the 26th to the end of the month. The following gives data for representative stations:—

Province.	Station.	Cloud Amount.		
		Mean actual.	Mean normal.	Variation from normal.
Behar	Patna	2·2	3·5	—1·3
Bengal	Berhampore	2·5	4·7	—2·2
	Dacca	3·0	4·1	—1·1
	Pedong	3·0	5·5	—2·5
Assam	Sibsagar	5·7	6·5	—0·8
Orissa	Cuttack	3·1	4·4	—1·3
Chota Nagpur	Hazaribagh	4·2	4·3	—0·1
Burma	Rangoon	4·7	6·1	—1·4
Andamans	Port Blair	5·0	5·7	—0·7

The cloud amount was almost as largely in defect in the Central Provinces, Berar and Bombay as in North-Eastern India. The following gives data for representative stations:—

Province.	Station.	Cloud Amount.		
		Mean actual.	Mean normal.	Variation from normal.
Central Provinces	Sambalpur	2·0	3·2	—1·2
	Nagpur	2·5	4·0	—1·5
Berar	Buldana	2·0	4·2	—2·2
Bombay	Bombay	2·2	4·2	—2·0
	Ratnagiri	1·7	3·2	—1·5
	Sholapur	5·4	6·1	—0·7

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 officer in the province, and published in the *Provincial Gazette*. 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 October 1891, 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. 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 160 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 indicating the rainfall. The line of no rainfall is indicated by two parallel lines separated by a short distance, one continuous and the other dotted, the latter facing the districts of no rainfall.

The second chart, illustrating the distribution of the rainfall of the month, is given in Plate V, and shows by figures the variation of the mean actual rainfall of the month from the normal rainfall in each of the 52 meteorological districts into which India and Burma have been divided for purposes of comparing crops and rainfall. The data of this chart are deduced from the rainfall information telegraphed by district officers, of which a summary is given in the following table, and the actual figures utilized are those given in the last column. The numbers given in the centre of each district are the variations of the actual mean rainfall of the district from the normal mean rainfall: a number given in a corner of each district in small slanting figures serves as an index, by means of which, on referring to the list of districts at the foot of the chart, the name of the district can be at once ascertained.

The rainfall of October is due to the retreating south-west monsoon current. Over the whole of North-Western and Central India the average rainfall of the month is less than two inches, and diminishes westwards to the Indus Valley, for which it is less than two-tenths of an inch. In the North and Central Deccan, Central Provinces, Bengal and the greater part of Burma the average rainfall ranges between 2 and 5 inches, whilst in Lower Burma and the Peninsula, south of Lat. 13° N, it ranges between 5 and 13 inches, and is greatest in amount in the Madras coast districts from Vizagapatam to Cuddalore.

The distribution of rainfall during the month of October 1891 is shown in Plate IV. The rainfall of the whole of India to the north of a line running from Karwar to Masulipatam was almost without exception less than 5 inches in amount, and over the greater part of the area was less than one inch in amount. In the southern half of the Peninsula the lines of equal rainfall run east and west, and the amounts increased southwards to Trivandrum, Cochin and Pamben, where it slightly exceeded 20 inches. In Central Burma the rainfall was less than one inch, and it increased from this area in all directions, but was less than 5 inches except in Arakan and Tenasserim. The following table gives rainfall data of the month based on the weekly telegrams received from district officers and the weekly rainfall averages used in comparing the data of these telegrams with the normal:—

Province.	Division.	Average actual rainfall of Division, 1st to 3rd October 1891.	Average actual rainfall of Division, 4th to 10th October 1891.	Average actual rainfall of Division, 11th to 17th October 1891.	Average actual rainfall of Division, 18th to 24th October 1891.	Average actual rainfall of Division, 25th to 31st October 1891.	Total Rainfall during the month.	Normal average rainfall during the month.	Variation from normal.
		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Burma	Tenasserim	0·90	1·15	1·94	0·94	0·33	5·26	7·67	— 2·41
	Lower Burma	0·20	0·28	1·06	0·77	0·07	2·38	6·36	— 3·98
	Central do.	0·45	0·66	1·12	0·89	0·45	3·57	5·76	— 2·19
	Upper do.	0·44	0·86	0·30	0·93	0	2·53	?	?
	Arakan	0·79	0·49	0·64	2·86	0	4·78	7·15	— 2·37
Bengal and Assam	Eastern Bengal	0·21	1·11	0	0·59	0	1·91	5·63	— 3·72
	Assam (Surma)	2·66	2·65	0	0·32	0	5·63	6·10	— 0·47
	Do. (Brahmaputra)	1·05	0·82	0	0	0·02	1·89	3·32	— 1·43
	Deltaic Bengal	0·28	0·34	0	0·07	0·01	0·70	4·03	— 3·33
	Central do.	0·25	1·12	0·06	0	0·10	1·53	3·56	— 2·03
	North do.	1·70	0·82	0	0	0·03	2·55	4·09	— 1·54
	Orissa	0·27	0·17	0·70	0	0·02	1·16	6·21	— 5·05
	Chota-Nagpur	0·39	0·12	0·21	0	0·09	0·81	2·70	— 1·89
	Behar (South)	0·39	0·22	0·25	0	0·08	0·94	2·69	— 1·75
	Do. (North)	0·70	0·12	0	0	0·03	0·85	3·00	— 2·15

Province.	Division.	Average actual rainfall of Division, 1st to 3rd October 1891.	Average actual rainfall of Division, 4th to 10th October 1891.	Average actual rainfall of Division, 11th to 17th October 1891.	Average actual rainfall of Division, 18th to 24th October 1891.	Average actual rainfall of Division, 25th to 31st October 1891.	Total rainfall during the month.	Normal average rainfall during the month.	Variation from normal.
		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
North-Western Provinces and Oudh.	North-Western Provinces (East)	0·69	0·08	0	0	0·02	0·79	1·93	− 1·14
	Oudh (South)	1·32	0·11	0	0	0·08	1·51	1·21	+ 0·30
	Do. (North)	2·89	0·07	0·02	0	0	2·98	1·21	+ 1·77
	North-Western Provinces (Central)	1·36	0·13	0	0	0	1·49	0·76	+ 0·73
	Do. do. (West)	1·02	0·51	0·12	0·04	0·11	1·80	0·59	+ 1·21
	Do. do. (Sub-montane)	1·97	0·52	0	0·01	0·02	2·52	1·19	+ 1·33
Punjab	Punjab (South)	0·03	0·58	0	0·04	0·03	0·68	0·15	+ 0·53
	Do. (Central)	0·14	0·68	0	0·05	0·12	0·99	0·30	+ 0·69
	Do. (Sub-montane)	0·23	0·79	0	0·05	0·01	1·08	0·29	+ 0·79
	Do. (Hill Districts)	0·63	2·77	0	0·15	0·14	3·69	0·62	+ 3·07
	Do. (North-West)	0·16	0·19	0·31	0·24	0·02	0·92	0·40	+ 0·52
	Do. (West)	0	0·01	0	0·02	0	0·03	0·06	− 0·03
Bombay and Malabar Coast Districts (Madras).	Malabar	0·29	1·90	6·74	5·86	1·48	16·27	9·83	+ 6·44
	Madras (South Central)	0·90	2·04	4·77	3·19	1·78	12·68	7·69	+ 4·99
	Coorg	0·52	3·73	1·28	3·62	0·50	9·65	9·00	+ 0·65
	Mysore	0·76	0·99	1·76	2·36	0·47	6·34	5·67	+ 0·67
	Konkan	1·06	1·45	0·74	0·54	0·29	4·08	5·08	− 1·00
	Bombay Deccan	0·47	2·82	0·72	0·13	0·25	4·39	4·30	+ 0·09
	Hyderabad (North)	0·10	0·84	0·17	0	0	1·11	3·03	— 1·92
	Khandeish	0·19	2·00	0	0	0	2·19	2·87	− 0·68
Central Provinces and Berar.	Berar	2·91	2·05	0	0	0	4·96	2·25	+ 2·71
	Central Provinces (West)	2·53	0·83	0	0	0	3·36	1·73	+ 1·63
	Do. (Central)	2·21	0·54	0	0	0·02	2·77	1·54	+ 1·23
	Do. (East)	0·25	0·49	0·04	0	0·01	0·79	1·74	− 0·95
Bombay (North)	Guzerat	0·34	0·13	0	0	0	0·47	0·93	− 0·46
	Kathiawar	0·04	0·14	0	0	0	0·18	0·48	− 0·30
	Sind	0·07	0	0	0	0	0·07	0·03	+ 0·04
Rajputana and Central India.	Central India (East)	0·96	0·52	0	0·01	0·02	1·51	0·87	+ 0·64
	Rajputana (East), Central India (West)	0·27	0·37	0·01	0	0·09	0·74	0·47	+ 0·27
	Rajputana (West)	0	0	0	0	0	0	0·17	— 0·17
Madras	East Coast (North)	0·50	0·58	0·59	0·06	0·06	1·79	7·73	− 5·94
	Do. (do.) (a)	0·28	1·45	0·45	0	0	2·18	?	?
	Hyderabad (South)	0·78	0·20	0·28	0	0·02	1·28	2·74	— 1·46
	Madras (Central)	0·58	0·37	0·41	0·58	0·20	2·14	4·85	— 2·71
	East Coast (Central)	0·93	0·17	1·26	0·97	0·92	4·25	8·73	— 4·48
	Do. (South)	0·82	0·96	2·21	6·05	1·77	11·81	8·32	+ 3·49
	Madras (South)	0·47	2·88	3·26	3·08	4·46	14·15	8·17	+ 5·98

It should be noted that the average data in the preceding statement differ in certain cases to some extent from the data of the monthly rainfall statements. The discrepancy is mainly due to the rainfall of the week ending 3rd October being divided proportionately into two periods, from the 27th to the 30th September for the September Review, and from the 1st to the 3rd October for the present Review, as the rainfall occurred chiefly during the first period; this method has given in some cases a larger rainfall than actually occurred in the month of October at the expense of the month. Some of these statements are not yet published in time to permit of their use in the preparation of exact comparative rainfall data of the month, but it is hoped that their publication will be shortly accelerated so as to enable this to be done in the forthcoming year.

Chart V is based on these weekly rainfall telegrams, but in the following discussion the more exact and complete data of the monthly rainfall statements are used for all districts for which they are available.

The whole of Burma received light to moderate occasional showers from the 1st to the 26th or 27th. The rainfall was most general on the 1st and 2nd, and again on the 24th and 25th, and on these days Upper Burma received moderate and general rain. The last week of the month was almost rainless over the whole of Burma. The rainfall of the month was very irregularly distributed. Amounts of half an inch or less were registered at the following stations:—

District.	Station.	Rainfall.
Henzada	Kanaung	0·48 inch.
Thayetmio	Thayetmio	0·41 "
Shwebo	Shwebo	0·48 "

The largest amount received in the month was 12·39 inches at Maymyo in the Mandalay district.

The following gives comparative data of the rainfall of the month in Burma:—

Province.	Division.	Rainfall in Inches.			Number of rainy days.		
		Actual average.	Normal average.	Variation from normal.	Actual average.	Normal average.	Variation from normal.
Burma	Tenasserim	5·26	7·67	—2·41	10·3		
	Lower Burma	2·38	6·36	—3·98	7·6		
	Central Do	3·57	5·76	—2·19	5·3		
	Upper do.	2·53	?	?	5·2		
	Arakan	4·78	7·15	—2·37	8·2		

The rainfall in the province of Bengal was unusually small in amount. Showers were received during the first week of the month (chiefly on the 3rd, 4th and 5th). East Bengal obtained moderate rain on the 21st and 22nd, and South-West Bengal and Orissa light local showers on the 29th and 30th. Over the greater part of the Province no rain fell after the 6th or 7th of the month. During the first period (*i.e.*, the 1st to 7th) Behar received fairly general and heavy rain on the 2nd and 3rd, and North Bengal on the 4th. In other districts the rainfall of this period was sporadic, light, and very irregularly distributed.

The following rainfalls in 24 hours exceeding four inches were recorded during the month:—

District.	Station.	Date.	Rainfall of 24 hours preceding 8 A.M. of date.
			Inches.
Mymensingh	Dewanganj	3rd	4·57
Rangpur	Rangpur	3rd	5·25
	Do.	4th	5·15
	Ulipore	3rd	4·62
Champaran	Bogaha	2nd	4·95
Sonthal Parganas	Pakur	4th	4·11
Dacca	Joydebpore	5th	4·80
Puri	Khurda	14th	4·26

The rainfall of the month was small in amount in Chota Nagpur, Orissa and South-West Bengal, at many stations of which the rainfall was actually *nil* or less than a tenth of an inch in amount. Thus, four rainfall stations out of seven in the district of Midnapore, two out of three in Howrah, and four out of ten in Bankura reported no rain. The chief features of the rainfall of the month in Behar and Bengal were hence, 1st, general deficiency, 2nd, great irregularity in the distribution of the actual rainfall. The deficiency was least marked in North Behar and the northern districts of North Bengal, which received moderate to heavy rain during the first week of the month. It increased in amount southwards and was actually greatest in the coast districts of Orissa and South Bengal and in East Bengal. The following gives rainfall average data of the month for the Province:—

Province.	Rainfall.			Number of rainy days.		
	Average actual, October 1891.	Average normal, October.	Variation.	Average actual, October 1891.	Average normal, October.	Variation.
	Inches.	Inches.	Inches.			
East Bengal	1·73	5·43	—3·70	2·4	6·1	—3·7
Deltaic Bengal	0·15	4·86	—4·71	0·6	5·7	—5·1
Central Bengal	0·96	4·04	—3·08	1·5	5·1	—3·6
North Bengal	2·02	4·38	—2·36	2·2	4·3	—2·1
Orissa	1·31	6·16	—4·85	1·9	6·8	—4·9
Chota Nagpur	0·53	2·97	—2·44	2·0	4·2	—2·2
Behar, South	1·50	3·30	—1·80	2·1	3·4	—1·3
Do. North	1·37	3·54	—2·17	1·9	2·9	—1·0

The North-Western Provinces received a general burst of rain from the 1st to the 4th of the month. Some light showers fell, chiefly in the western districts, on the 25th and 27th, but they were of no importance. The rainfall of the first week was very heavy in the eastern districts through which advanced the feeble cyclonic storm which passed from the Central Provinces into the North-Western Provinces on the 30th of September. The following gives the most noteworthy rainfalls due to the storm in the North-Western Provinces:—

District.	Station.	Date.	Rainfall of 24 hours preceding 8 A.M. of date.
			Inches.
Gorakhpur	Parauna	1st	5·40
	Bansgaon	2nd	7·00
	Do.	3rd	5·30
	Moharajganj	2nd	6·30
	Gorakhpur	2nd	4·90

The rainfall of the period was hence very heavy in the Gorakhpur district. It was also large in amount in Sitapur, Bahraich, and Fyzabad in the north of Oudh, in which amounts ranging from 3 to 5 inches in 24 hours were also reported during this period. The rainfall diminished in amount westwards, and was less than an inch over the greater part of the Trans-Jumna districts of the Province. The rainfall of the month was in general excess. The excess was large in the Gorakhpur, Basti, Sitapur and Bahraich districts. The Gorakhpur district received an average of 9·1 inches, the normal amount for the month being 2·8 inches. The average fall of the Sitapur district was 4·9 inches (the normal being 1·2 inches), and of Bahraich 4·9 inches, the normal being 1·8 inches.

The rainfall of the month was below the normal in the following districts in the Gangetic Doab, for which data are given :—

District.	Rainfall.			Number of rainy days.		
	Average actual, October 1891.	Average normal, October.	Variation from normal.	Average actual, October 1891.	Average normal, October.	Variation from normal.
	Inches.	Inches	Inches.			
Etawah . .	0·19	1·12	—0·93	0·8	1·0	—0·2
Cawnpore . .	0·39	1·07	—0·68	0·9	1·2	—0·3
Farukhabad .	0·44	1·01	—0·57	1·0	1·0	0

The rainfall of the month was very irregularly distributed over the whole of the western and central districts one rainfall station in a district receiving little or no rain, whilst a neighbouring station had a considerable excess.

The following gives average data for the six meteorological districts into which the North-Western Provinces and Oudh are divided :—

District.	Rainfall.			Number of rainy days.		
	Average actual, October 1891.	Average normal, October.	Variation from normal.	Average actual, October 1891.	Average normal, October.	Variation from normal.
	Inches.	Inches.	Inches.			
North-Western Provinces, East.	2·51	2·48	+0·03	2·2	2·0	+0·2
North-Western Provinces, Central.	1·49	0·76	+0·73	1·3	1·1	+0·2
North-Western Provinces, West.	1·80	0·59	+1·21	1·4	0·6	+0·8
North-Western Provinces, Sub-montane.	2·52	1·19	+1·33	2·1	0·7	+1·4
Oudh, North . .	2·98	1·21	+1·77	2·2	1·5	+0·7
Do. South . .	1·51	1·21	+0·30	2·0	1·6	+0·4

The Punjab received general rain during the first week of the month from the 2nd to the 6th. Rain fell during this period in all districts except Montgomery, Jhang, Bannu, Dera Ismail Khan, Muzaffargarh, Mooltan, and the greater part of Shahpur. It was small in amount in the Jhelum, Guzerat and Gujranwala districts. The rainfall was moderately heavy in the remaining districts, the majority of stations receiving amounts exceeding one inch.

Showers giving very light but fairly general rain over the greater part of the province occurred on the 22nd and 23rd. The Peshawar, Hazara and Rawalpindi districts also received light showers on the 17th and 18th.

The rainfall of the month was characterised by great irregularity. The following gives example from the returns of four districts :—

District.	Station.	Actual rainfall of month.	Normal rainfall of month.
		Inches.	Inches.
Gurgaon . .	Palwal . . .	0·26	0·67
	Nuh	2·50	0·29
Rohtak . .	Rohtak . . .	0·15	0·37
	Gohana . . .	1·83	0·30
Lahore . .	Chunian . . .	0·15	0·30
	Kasur . . .	2·49	0·22
Umballa . .	Jagadhri . . .	0·05	0·43
	Rupar . . .	1·99	0·38

The normal average rainfall of the month ranges from *nil* in the western districts to half an inch at the more easterly stations lying at the foot of the hills.

The western districts of Bannu, Jhang, Mooltan, Muzaffargarh, Dera Ghazi Khan and Dera Ismail Khan received no rain during the month. The rainfall of the month was also in defect in the Jhelum and Montgomery districts, but was more or less in excess in other districts. The great majority of these districts obtained average amounts, three to four times as large as the normal average fall of the month, but, as already stated, the rainfall was very irregularly distributed even in these districts which received the largest amounts. The rainfall was most abundant in the south-eastern districts and in the Rawalpindi and Hazara districts. The following gives data showing the distribution of the rainfall in the districts where the rainfall was heaviest :—

District.	Average actual rainfall.	Normal average rainfall.	Smallest recorded rainfall in district.	Largest recorded rainfall in district.
	Inches.	Inches.	Inches.	Inches.
Lahore	0·95	0·32	0·07	2·49
Gurgaon	1·10	0·44	0·26	2·79
Gurdaspur . . .	1·71	0·43	0·62	3·19
Jullundur . . .	1·38	0·25	0·50	2·25
Ludhiana . . .	1·82	0·35	0·77	3·13
Hoshiarpur . . .	1·28	0·39	0·97	1·70
Rawalpindi . . .	2·01	0·69	0·25	4·04
Hazara	4·11	1·02	2·60	7·01
Umballa	0·94	0·43	0·05	1·99

The following table gives average rainfall data for the six meteorological districts into which the province is divided :—

District.	Rainfall.			Number of rainy days.		
	Actual average of district.	Normal average of district.	Variation from normal.	Actual average of district.	Normal average of district.	Variation from normal.
	Inches.	Inches.	Inches.			
Punjab, South . .	0·68	0·15	+0·53	1·2	0·4	+0·8
Do., Central . .	0·99	0·30	+0·69	1·6	0·5	+1·1
Do., Sub-mountane.	1·08	0·29	+0·79	1·9	0·3	+1·6
Do., North-West .	0·92	0·40	+0·52	2·7	0·7	+2·0
Do., West . .	0·03	0·06	—0·03	0·1	0·3	—0·2
Do., Hill Districts .	3·69	0·62	+3·07	4·5	1·5	+3·0

No rain fell in Kashmir during the month, and practically none in Beluchistan.

The western districts of Rajputana, including Jasulmere, Jodhpore, Bickaneer, Kerowlee, Tonk, Oodeypore, Sirohee, Partabgarh, Khusalgarh and Ajmir-Merwara received no rain during the whole of the month, with the exception of a few isolated local showers of no importance. The eastern states, including Ulwar, Bhurtpore and Jeypore, bordering on the North-Western Provinces, obtained moderate rain during the first week of the month. The 3rd and 4th were the days of most general rain. Ulwar obtained an average of 1·7 inches during this period. The normal fall of the month in that state is probably less than an inch. The rainfall was somewhat less in amount in Bhurtpore and Jeypore, but was above the normal of the month to a slight extent.

The month was as dry in the western districts of Central India as in the western districts of Rajputana. Indore and Gwalior received practically no rain. Moderate rain fell in Bhopal, Rewah and Bundelkhand during the first week of the month. The rainfall of the month was slightly in excess in Bundelkhand and below it in Rewa.

October 1891 was a very dry month in the Central Provinces. Rain fell between the 1st and the 7th, but was light and sporadic in character. It was most general on the 6th. Only 11 out of the 66 rainfall-recording stations received rainfalls in 24 hours exceeding one inch. No rain fell during the remainder of the month with the exception of a few local showers, chiefly on the 28th and 29th, of little or no importance.

The following gives data for the three meteorological districts into which the province is divided :—

District.	Rainfall.			Number of rainy days.		
	Actual average of district.	Normal average of district.	Variation from normal.	Actual average of district.	Normal average of district.	Variation from normal.
	Inches.	Inches.	Inches.			
Central Provinces (West) .	3·36	1·73	+1·63	1·7	2·6	−0·9
Do. (Central)	2·77	1·54	+1·23	1·8	2·4	−0·6
Do. (East) .	0·79	1·74	−0·95	1·9	2·6	−0·7

Hyderabad received some light local showers, chiefly during the first week of the month. The rainfall of the month was below the normal over nearly the whole State. The deficiency was small in Raichur, Beeder and Nulgoonda. The rainfall in the remaining districts ranged from 125 to 150 per cent. of the normal, which averages nearly 3 inches for the whole State, and ranges from 2 inches in Ibrampatam to 4½ inches in Raichur.

The rainfall in Bombay was, with very few exceptions below the normal of the month. The month was rainless in Sind. Kathiawar, Cutch and Guzerat obtained a few light local showers during the first week of the month, after which dry clear weather set in. The Bombay-Deccan districts of Poona, Ahmednagar, Sholapur and also Nasik and Khandesh obtained moderate rain during the first week of the month. The 5th and 6th were the days of most general rain. The Southern Deccan districts of Belgaum, Dharwar, Sholapur and Bijapur had almost daily moderate to heavy showers from the 2nd to the 19th, and a few local showers on the 24th, 25th, 26th and 27th. The northern coast districts of Surat, Thana and Colaba received moderate general rain on the 1st, 6th and 8th, after which dry weather set in, and continued during the remainder of the month. In Canara, as in Malabar, the rains continued fairly steadily until nearly the end of the month. The falls were generally light, but gave on the whole larger amounts than usual. The following gives comparative data for the districts into which the Bombay Presidency is divided :—

Meteorological District.	Rainfall in inches.			Number of rainy days.		
	Average actual.	Average normal.	Variation from normal.	Average actual.	Average normal.	Variation from normal.
Konkan . .	3·18	5·72	−2·54	5·2	7·4	−2·2
Bombay (Deccan)	4·31	5·07	−0·76	6·9	7·3	−0·4
North Deccan .	2·41	3·73	−1·32	3·0	5·6	−2·6
Guzerat . .	0·21	1·49	−1·28	1·2	2·5	−1·3
Kathiawar . .	0·52	0·85	−0·33	1·5	1·4	−0·1

Mysore obtained moderate general rain during the month. The chief periods of rainfall were from the 1st to the 5th, the 16th to the 18th, and 22nd to the 27th. The following gives data of the rainfall of the month for the eight districts of Mysore :—

District.	Rainfall in inches.			Number of rainy days.		
	Actual average.	Normal average.	Variation from normal.	Actual average.	Normal average.	Variation from normal.
Bangalore . . .	5·38	5·84	−0·46	9·5	7·6	+1·9
Kolar	3·83	5·6	−1·80	7·0	7·6	−0·6
Tumkur . . .	3·98	5·36	−1·38	7·0	7·8	−0·8
Mysore	5·20	5·94	−0·74	10·0	8·9	+1·1
Shimoga . . .	8·70	5·29	+3·41	9·0	8·0	+1·0
Kadur	9·30	6·47	+2·83	10·0	10·1	−0·1
Hassan	7·28	5·71	+1·57	11·0	9·2	+1·8
Chitaldroog . . .	4·30	3·76	+0·54	7·5	5·8	+1·7

The data show that the western districts received amounts somewhat in excess of the average, whilst the eastern districts obtained smaller amounts than usual.

Weather was showery in every part of Madras at the commencement of the month. Godavari, Nellore and Kistna received the smallest amounts at this time. The southern districts on the other hand obtained moderately heavy rain during the first week of the month. The 7th to the 9th or 10th was a dry period. This was followed by a heavy burst of rain, lasting from the 10th to the 17th or 18th over the whole of South and Central Madras. Madras North and Central received some local showers during this period, but

the weather was, as hitherto, exceptionally dry in these districts. After a short period of light local showers, from the 19th to the 21st, general rain again fell over the whole of Madras to the south of Nellore and Cuddapah.

Little or no rain was received during this period in North Madras. In the Madras, Deccan, and the districts of Nellore, Chingleput and North Arcot, as well as in Karnool, Bellary, Cuddapah and Anantapur, this burst of rain ceased on the 26th or 27th. In the Southern and Central districts it continued until the end of month. The rainfall of the 23rd was exceptionally heavy in North and South Arcot and Trichinopoly. Thus ten rainfall stations out of seventeen in South Arcot registered amounts on the 23rd exceeding four inches, the largest amount being 8·45 inches at Gingee. The rains were hence favourable and abundant over the whole of Madras to the south of Lat. 1·33° N. They commenced earlier than usual, and continued steadily throughout the month. The following gives a summary of the rainfall data of the month for comparison with those of the previous months of August and September:—

Meteorological District.	October.					
	Average actual rainfall, October, 1891.	Average normal rainfall, October.	Variation from normal.	Average actual number of rainy days.	Average normal number of rainy days.	Variation from normal.
Madras East Coast, North	1·64	7·02	— 5·38	3·0	7·4	— 4·4
Do. Do. Central	5·26	9·75	— 4·49	8·3	8·4	— 0·1
Do. Do., South	11·42	8·33	+ 3·09	13·5	9·2	+ 4·3
Do., South	16·50	5·96	+ 10·54	19·6	8·1	+ 11·5
Malabar Coast	12·53	9·96	+ 2·57	14·4	11·9	+ 2·5
Madras, South, Central	6·83	5·83	+ 1·00	10·5	7·9	+ 2·6
Do. Hills	23·14	9·24	+ 13·90	20·3	12·1	+ 8·2
Do., Central	2·91	5·57	— 2·66	5·5	6·7	— 1·2

Explanation of Tables.

Table I gives an abstract of the meteorological observations at 8 A.M. daily, taken at 162 stations in India during the month of October 1891.

In this table the observing stations are grouped under two sets of divisions. According to the first arrangement, India and Burma are divided into eleven large meteorological areas or provinces. These divisions have been selected in consultation with the Medical Department. The climatic conditions of each area are fairly uniform, and they hence are presumed to form suitable areas for the discussion of the relations between disease and meteorology. The names of these divisions are printed in bold type, and the mean variations of the more important meteorological data, more especially temperature, are given opposite to each in prominent figures.

Each of these larger divisions is sub-divided into smaller meteorological areas or districts, of which there are 51 in all. This sub-division was made in consultation with the Revenue and Financial Departments. In each of these smaller areas the distribution and character of the rainfall are fairly uniform, and the staple crops in each are hence the same. This sub-division will, it is hoped, enable a more exact comparison to be made between crops and rainfall than has been hitherto possible.

The headings of the columns in the great majority of cases explain themselves. The figures in the third column "Variation from normal" are obtained by taking in each case the difference between the mean actual barometer (reduced for temperature, but not to sea-level or constant gravity) and the normal means obtained from the observations of the eleven years' period 1878—88.

The "Mean daily temperature" is assumed in Table I to be the mean of the maximum and minimum. It is chiefly utilized in order to obtain the mean variation of the temperature of the month from the normal.

In obtaining the figures for the column headed "Number of rainy days," a rainy day is assumed to be one on which a fall of a tenth of an inch or upwards has been recorded. A fall of less than a tenth of an inch is practically of no value for agricultural purposes in India, and it has not been found possible to secure the accurate record of rainfalls of less than a tenth of an inch at a great majority of the rainfall-recording stations.

Table II gives an abstract of the observations recorded at 10 A.M. and 4 P.M. at 89 second class observatories throughout India, Burma and the adjacent regions. This Table is intended in part to supplement Table I, and hence information given in full in the latter Table, as, for example, rainfall, is not included in Table II. This Table is intended to give for the month, so far as is possible, all the information furnished hitherto in the Appendix A. of the Annual Report on the Meteorology of India. The methods of calculating the means have been very fully explained in the annual reports, to which the reader is referred for complete information. The data of the mean daily pressure, the figures of which are given in the sixth column, are the means of the 10 and 16 hours' observations, with corrections obtained from a comparison of the 10 and 16 hours' observations of the same or a neighbouring observatory with a series of hourly observations at the same observatory.

The mean temperature is calculated by the formula mean $= \frac{\text{maximum} + 16 \text{ hours} + 2 \text{ minimum}}{4}$ by applying a constant correction for each month, derived from the hourly observations of the same or of a neighbouring station.

The mean daily vapour tension and humidity are the

averages of the values for 10 A.M., 4 P.M., and the minimum readings and the mean daily cloud is the average of the mean amounts for 10 and 16 hours.

The mean wind directions for each month are the trigonometrical resultants of the winds given under each of the eight cardinal points, and are calculated by means of Lambert's formula, in which an equal weight or value is given to every wind.

It should be noted that in the preceding discussion, in speaking of the maximum, minimum, or mean temperature, the total amount of wind or the rainfall of a given day, as, for example, the 5th, the maximum, etc., of the 24 hours preceding 8 A.M. of the 5th is meant. This definition has been adopted to avoid confusion. As the observations are taken at 8 A.M., a part of them refer to 8 A.M. of that day and a part to the previous 24 hours, and, therefore, including a portion of the previous civil day. It is found most convenient to use the same date to designate and define both classes of observations.

Table

Abstract of Observations taken at 8 A.M. at 161

Meteorological Province or District.	Station.	Height of Station in feet.	Pressure 8 A.M. in inches. 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.	Temperature of Air. 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.		...	...	+·021	...	...	...	...	...	...	...	89·1	+1·1	74·4	−0·7	81·7	+0·2	14·8	...	...	...	...	...
Bay Islands	Port Blair	61·16	29·872	?	29·864	29·937	2nd	29·824	25th	·113	81·3	89·0	?	78·1	?	83·5	?	10·9	91·0	16th	75·9	18th	15·1
	Camorta	?	29·916	?	?	29·983	2nd	29·865	19th	·118	80·2	84·9	?	75·9	?	80·4	?	9·0	87·7	21st	74·6	26th	13·1
Tenasserim	Mergui	96·27	29·843	?	29·870	29·934	2nd	29·770	22nd	·164	79·0	88·3	?	68·5	?	78·4	?	19·8	90·1	21st	67·0	10th	23·1
	Tavoy	26·26	29·929	?	29·888	30·021	2nd	29·859	25th	·162	75·7	89·5	?	74·1	?	81·8	?	15·4	91·7	19th	72·2	9th	19·5
	Moulmein	93·79	29·860	+·006	29·893	29·967	2nd	29·780	22nd	·187	80·1	89·6	+1·5	75·7	+1·4	82·7	+1·5	13·9	92·5	31st	72·3	12th	20·2
	Toungoo	181·1	29·761	+·019	29·888	29·851	31st	29·699	25th	·152	77·9	89·8	0	73·3	−1·3	81·6	−0·7	16·5	93·2	11th	67·7	29th	25·5
Lower Burma	Rangoon	40·69	29·910	+·017	29·889	30·007	2nd	29·847	22nd	·160	78·4	90·6	+1·0	74·6	−1·2	82·3	−0·1	16·0	92·2	8th	70·9	26th	21·3
	Bassein	21	29·933	+·030	29·892	30·017	2nd	29·874	25th	·143	78·7	88·5	+1·6	74·6	−0·5	81·6	+0·6	13·9	91·2	9th & 14th.	70·9	26th	20·3
	Diamond Island.	41	29·909	+·025	29·887	25·996	2nd	29·842	22nd	·154	82·5	88·3	+1·9	73·0	−3·5	80·7	−0·8	15·3	91·8	14th	70·6	23rd & 24th	21·2
Arakan	Akyab	20·44	29·929	+·029	29·894	30·030	31st	29·856	22rd	·174	79·4	88·6	+0·5	77·4	+0·7	83·0	+0·6	11·2	93·2	3 days	74·1	27th & 28th.	19·1
I.—Burma, Inland		...	...	+·035	...	...	...	...	...	...	...	90·4	+1·1	70·7	−5·0	80·6	−2·0	19·7	...	...	...	...	...
Central Burma	Thayetmyo	134	29·817	+·035	29·896	29·910	31st	29·761	22nd	·149	79·2	91·3	+1·1	69·3	−5·0	80·3	−2·0	22·0	94·7	3 days	62·9	25th, 28th & 29th.	31·8
Upper Burma	Mandalay	?	29·714	?	29·660	29·813	31st	29·659	22nd	·154	79·9	93·1	?	75·1	?	84·2	?	18·0	97·5	7th	69·2	28th & 29th.	28·3
	Kindat	?	29·578	?	29·526	29·691	31st	29·508	22nd	·183	76·7	88·3	?	71·5	?	79·9	?	16·8	93·8	1st	65·0	31st	28·8
	Bhamo	?	29·547	?	29·497	29·665	31st	29·495	22nd	·170	74·3	88·9	?	66·8	?	77·8	?	22·1	93·1	3 days	58·2	27th	34·9
III.—Assam		...	...	+·027	...	...	...	...	...	...	...	86·0	−0·5	69·8	−2·4	77·9	−1·5	16·2	...	...	...	...	...
Assam (Surma)	Silchar	104·3	29·855	+·040	29·912	29·973	31st	29·777	22nd	·196	76·1	89·0	+0·1	70·7	−1·8	79·9	−0·9	18·3	93·0	20th	65·3	26th & 31st.	27·7
Brahmaputra	Sibsagar	333	29·626	+·005	29·929	29·778	31st	29·555	3rd	·223	69·9	84·4	−0·9	68·3	−2·6	76·4	−1·8	16·1	88·6	11th	62·8	3 days	25·8
	Dhubri	115·34	29·849	+·035	29·921	29·994	31st	29·768	1st	·226	73·6	84·5	−0·6	70·3	−2·9	77·4	−1·8	14·2	88·7	2nd	65·9	29th & 31st.	22·8
IV.—Bengal and Orissa		...	...	+·043	...	...	...	...	...	...	...	87·6	+0·6	71·6	−2·0	79·7	−0·7	15·9	...	...	...	...	...
East Bengal	Chittagong	86·7	29·870	+·037	29·905	29·967	31st	29·785	22nd	·182	77·8	87·3	+0·8	71·0	−2·8	79·2	−1·0	16·3	90·2	10th & 13th.	65·6	30th	24·6
	Lungleh	?	?	?	?	?	?	?	?	?	66·0	66·9	?	63·7	?	65·4	?	3·2	69·9	10th	59·4	21st	10·5
	Noakhali	42·73	29·918	?	29·908	30·027	31st	29·816	22nd	·211	78·3	86·9	?	70·5	?	78·7	?	16·4	89·0	2nd, 12th, 20th & 21st	62·5	31st	26·5
	Comilla	34·74	29·932	?	29·915	30·044	31st	29·847	22nd	·197	78·0	87·8	?	71·0	?	79·4	?	16·8	91·3	2nd	63·4	31st	27·9
	Siraiganj	46·37	29·907	?	29·903	30·036	31st	29·844	22nd	·192	77·7	87·5	?	70·4	?	79·0	?	17·1	91·1	2nd	63·8	31st	27·3
	Dacca	21·7	29·933	+·045	29·903	30·059	31st	29·867	22nd	·192	79·1	88·6	+0·5	72·3	−3·0	80·5	−1·3	16·3	92·1	2nd	67·2	31st	24·9
	Burrisal	12	29·942	+·056	29·898	30·055	31st	29·864	22nd	·191	81·1	88·0	+1·8	72·8	−1·5	80·4	+0·2	15·2	91·8	2nd	66·0	31st	25·8
	Mymensingh	55·18	29·901	+·055	29·910	30·032	31st	29·837	22nd	·195	77·1	86·8	−0·7	71·3	−2·2	79·1	−1·5	15·5	90·2	2nd	65·6	30th & 31st.	24·6
Deltaic Bengal	Faridpur	39	29·929	?	29·916	30·045	31st	29·868	22nd	·177	79·7	86·5	?	72·9	?	79·7	?	13·6	89·5	2nd	66·9	31st	22·6
	Jessore	33·29	29·922	+·041	29·902	30·055	31st	29·861	22nd	·194	79·4	89·2	+0·4	73·2	−1·7	81·2	−0·7	16·0	92·2	7th	67·5	28th & 31st.	24·7
	Calcutta	21·38	29·938	+·049	29·905	30·078	31st	29·870	22nd	·208	79·3	87·3	+0·6	73·2	−1·3	80·3	−0·4	14·1	90·1	7th	67·7	28th	22·4
	Saugor Island	25·3	29·933	+·052	29·902	30·064	31st	29·855	22nd	·209	80·5	87·9	+1·0	75·4	−0·6	81·7	+0·2	12·5	91·2	7th & 9th	70·0	25th & 26th.	21·2
	Krishnagar	46·64	29·905	?	29·901	30·044	31st	29·843	4th	·201	79·2	90·1	?	71·7	?	81·0	?	18·4	92·3	7th	64·7	28th	27·6
	Midnapore	148·88	29·806	?	29·903	29·937	31st	29·733	22nd	·204	78·8	89·8	?	72·4	?	81·1	?	17·4	92·3	5 dates	66·2	23rd	26·1
Central Bengal	Bankura	298	29·629	?	29·88[illegible]	29·768	31st	29·544	1st	·224	77·4	89·3	?	72·1	?	80·7	?	17·2	92·1	7th	66·7	23rd & 24th.	25·4
	Raniganj*	345·15	29·627	?	29·927	29·728	31st	29·545	1st	·18[illegible]	76·6	†89·4	?	‡71·6	?	§80·6	?	17·8	91·5	5 dates	63·5	30th	28·0
	Burdwan	99·09	29·869	+·054	29·916	30·007	31st	29·802	1st	·205	78·8	90·0	+1·3	73·0	−1·7	81·5	−0·2	17·0	92·1	27th	67·4	24th & 25th.	24·7

* Mean of 30 days. ‡ Mean of 28 days.
† „ „ 27 „ § „ „ 26 „

I.

stations in India, Burma, &c., in October 1891.

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 October to 31st October 1891.	Normal rainfall for period 1st October to 31st October.	Variation from normal of period.	Station.	Meteorological Province or District.
...	...	...	...	...	...	...	..	...	...	...	...	...	...	...	...	...	...	5·90	9·53	−3·63	...	...	...	**I.—Burma Coast and Bay Islands.**	
9	4	4	1	4	1	2	2	4	4	6	−33	90	·967	4·4	10	...	...	5·65	12·17	−6·52	5·65	12·17	−6·52	Port Blair .	BAY ISLANDS.
28	1	1	...	...	...	...	...	...	?	?	?	89	·916	8·6	13	...	...	8·04	?	?	8·04	?	?	Camorta.	
...	5	5	4	5	1	4	1	6	2	1	+100	88	·876	4·4	19	...	...	15·65	13·54	+2·11	15·65	13·54	+2·11	Mergui .	TENASSERIM.
30	...	...	1	...	...	...	...	...	1	?	?	89	·887	1·7	11	...	...	5·18	10·51	−5·33	5·18	10·51	−5·33	Tavoy.	
...	4	6	4	2	4	3	2	6	2	2	0	88	·912	1·4	10	...	...	4·22	8·28	−4·06	4·22	8·28	−4·06	Moulmein.	
7	6	8	2	4	2	...	...	2	1	2	−50	89	·855	5·2	6	...	...	3·57	7·01	−3·44	3·57	7·01	−3·44	Toungoo.	
...	4	7	6	...	2	2	6	4	3	3	0	91	·892	4·5	7	...	...	1·63	7·09	−5·46	1·63	7·09	−5·46	Rangoon .	LOWER BURMA.
10	2	4	5	...	...	...	2	8	3	3	0	90	·893	4·6	8	...	...	5·29	8·21	−2·92	5·29	8·21	−2·92	Bassein.	
8	6	5	6	...	1	...	1	4	4	7	−43	80	·889	4·0	7	...	...	3·22	8·92	−5·70	3·22	8·92	−5·70	Diamond Island.	
...	4	24	2	...	1	...	...	...	3	2	+50	89	·890	5·0	6	...	...	8·68	10·03	−1·35	8·68	10·03	−1·35	Akyab .	ARAKAN.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2·67	4·44	−1·77	...	...	...	**II.—Burma, Inland.**	
...	12	...	...	1	9	2	1	6	5	3	+67	83	·830	4·2	2	...	...	0·41	4·47	−4·06	0·41	4·47	−4·06	Thayetmyo .	CENTRAL BURMA.
9	2	...	...	...	20	...	...	...	?	?	?	80	·820	4·1	5	...	...	3·20	2·85	+0·35	3·20	2·85	+0·35	Mandalay .	UPPER BURMA.
23	2	1	...	1	...	1	...	3	3	?	?	94	·863	0·6	4	...	...	5·17	5·99	−0·82	5·17	5·99	−0·82	Kendat.	
4	...	11	...	2	...	5	1	8	?	?	?	82	·700	2·7	2	...	...	1·90	4·45	−2·55	1·90	4·45	−2·55	Bhamo.	
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3·30	4·49	−1·19	...	...	...	**III.—Assam.**	
30	1	...	...	...	...	...	...	...	0	2	−100	89	·806	5·5	6	...	...	4·21	4·87	−0·66	4·21	4·87	−0·66	Silchar .	ASSAM (SURMA).
1	...	22	...	5	...	3	...	...	2	2	0	98	·721	8·8	6	...	...	4·48	5·17	−0·69	4·48	5·17	−0·69	Sibsagar .	BRAHMAPUTRA.
5	3	9	6	1	...	5	1	1	3	3	0	86	·710	2·3	2	...	...	1·20	3·43	−2·23	1·20	3·43	−2·23	Dhubri.	
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1·75	5·18	−3·68		...	...	**IV.—Bengal and Orissa.**	
15	3	5	4	...	3	...	...	1	1	3	−67	86	·826	3·3	4	...	...	1·77	5·03	−3·26	1·77	5·03	−3·26	Chittagong .	EAST BENGAL.
?	?	?	?	?	?	?	?	?	?	?	?	94	·604	?	9	...	...	8·25	?	?	8·25	?	?	Lungleh.	
4	10	8	5	...	3	...	..	1	4	?	?	85	?	0·6	3	...	...	2·96	7·66	−4·70	2·96	7·66	−4·70	Noakhali.	
5	10	5	5	3	1	1	1	...	1	?	?	84	?	2·0	3	...	...	2·39	5·30	−2·91	2·39	5·30	−2·91	Comilla.	
...	6	4	3	5	4	5	3	1	1	?	?	85	?	2·2	1	...	...	3·52	?	?	3·52	?	?	Sirajganj.	
2	7	5	3	3	3	5	1	2	3	2	+50	80	·794	2·7	0	...	...	0·08	4·71	−4·63	0·08	4·71	−4·63	Dacca.	
12	7	7	...	1	1	3	...	...	2	?	?	77	·829	1·0	2	...	...	0·51	5·33	−4·82	0·51	5·33	−4·82	Burrisal.	
2	3	7	11	4	1	1	1	1	2	?	?	86	·800	2·3	3	...	...	3·49	5·88	−2·39	3·49	5·88	−2·39	Mymensingh.	
14	4	2	2	2	4	2	...	1	2	?	?	84	?	1·2	2	...	...	1·50	4·31	−2·81	1·50	4·31	−2·81	Faridpur .	DELTAIC BENGAL.
19	5	3	1	1	1	...	1	...	2	2	0	83	·841	2·1	0	...	...	0·10	3·75	−3·65	0·10	3·75	−3·65	Jessore.	
...	8	3	3	...	2	8	3	4	3	3	0	78	·787	2·0	1	...	...	0·10	3·79	−3·69	0·10	3·79	−3·69	Calcutta.	
...	9	5	2	...	2	5	2	6	8	7	+14	82	·863	3·6	1	...	...	0·21	7·96	−7·75	0·21	7·96	−7·75	Saugor Island.	
3	3	4	5	1	4	3	3	5	3	?	?	76	?	3·1	2	...	...	1·11	4·54	−3·43	1·11	4·54	−3·43	Krishnagar.	
1	15	5	...	...	4	2	1	3	9	?	?	79	?	1·7	1	...	...	0·58	4·81	−4·23	0·58	4·81	−4·23	Midnapore.	
11	3	...	2	1	2	...	8	4	2	?	?	77	?	1·6	2	...	...	1·14	4·48	−3·34	1·14	4·48	−3·34	Bankura .	CENTRAL BENGAL.
2	3	4	3	2	...	4	6	6	2†	?	?	78†	?	1·1‡	3	...	...	1·85	?	?	1·85	?	?	Raniganj.*	
6	9	3	3	...	4	1	2	3	2	2	0	71	·702	3·2	2	...	...	0·48	3·31	−2·83	0·48	3·31	−2·83	Burdwan.	

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

Table

Abstract of Observations taken at 8 A.M. at 161 stations

Meteorological Province or District.	Station.	Height of Station 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.
Central Bengal —*concld.*	Naya Dumka	490	29·458	?	29·909	29·599	31st	29·378	4th	·221	79·5	88·9	?	69·7	?	79·3	?	19·2	91·1	3rd	63·9	31st	27·2
	Berhampore	66·45	29·889	+·037	29·905	30·047	31st	29·814	4th	·233	77·4	88·3	+0·5	73·3	−1·2	80·8	−0·4	15·0	91·1	2nd	68·2	28th	22·9
	Rampur Boalia.	70	29·879	?	29·899	30·026	31st	29·816	1st	·210	78·1	87·5	?	71·7	?	79·7	?	15·8	90·8	2nd	65·7	31st	25·1
	Malda*	80	29·870	?	29·903	30·023	31st	29·783	3rd	·240	78·3	89·7	?	70·0†	?	79·9†	?	19·7	93·6	2nd	62·9	31st	30·7
	Bogra	61·48	29·876	+·002	29·890	30·015	31st	29·808	4th	·207	77·9	88·2	+0·7	70·5	−2·2	79·4	−0·8	17·7	91·8	2nd	64·2	31st	27·6
North Bengal	Dinajpur	9·23	29·831	+·025	29·904	29·946	31st	29·755	1st	·191	76·6	88·0	+0·4	68·3	−5·0	78·2	−2·3	19·7	92·6	2nd	60·8	31st	31·8
	Rangpur	123	29·845	?	29·924	29·991	31st	29·771	1st	·220	75·4	87·0	?	68·7	?	77·9	?	18·3	91·3	2nd	63·7	29th & 31st.	27·6
	Jalpaiguri	283·7	29·666	+·030	29·909	29·818	31st	29·588	3rd	·230	74·4	85·9	−0·7	66·7	−2·8	76·4	−1·8	19·2	90·4	2nd	61·1	31st	29·3
Orissa	Balasore	53·98	29·899	+·048	29·902	30·033	31st	29·819	22nd	·214	77·2	88·9	+1·1	71·9	−0·6	80·5	+0·3	17·0	92·4	7th	65·8	24th & 25th.	26·6
	False Point	20·60	29·942	+·054	29·905	30·057	31st	29·853	22nd	·204	79·8	88·3	+0·9	72·5	−2·3	80·5	−0·7	15·8	91·5	8th	68·0	3 days	23·5
	Cuttack	80	29·887	+·065	29·911	30·015	31st	29·804	22nd	·211	79·4	90·3	+0·3	73·4	−1·1	81·9	−0·4	16·9	93·9	8th	69·8	5 days	24·1
	Short's Island	?	29·939	?	?	30·049	31st	29·856	1st	·193	83·1	87·9	?	77·3	?	82·6	?	10·6	92·2	6th	66·4	6th	25·8
	Puri	9·23	29·936	?	29·885	30·044	31st	29·856	22nd	·188	80·1	89·2	?	76·8	?	83·0	?	12·4	91·7	5th, 8th & 9th.	72·6	31st	19·1
.—Gangetic Plain and Chota Nagpur.		...	...	+·043	...	...	...	...	...	...	...	88·0	−0·6	68·0	−1·8	78·0	−1·2	19·9	...	...	...	...	...
Chota Nagpur	Hazaribagh	2,007·12	27·943	+·042	29·913	28·070	31st	27·852	1st	·218	74·2	84·3	+1·2	65·9	−1·0	75·1	+0·1	18·4	86·7	7th, 26th & 28th.	60·8	27th & 30th	25·9
	Ranchi	2,128·14	27·818	?	29·903	27·946	31st	27·740	1st	·206	73·7	82·8	?	65·3	?	74·1	?	17·5	86·0	7th	59·9	30th	26·1
	Chaibassa	760	29·187	+·057	29·905	29·316	31st	29·095	1st	·221	75·6	88·5	+0·3	68·9*	−1·0	78·8*	−0·4	19·6	91·4	6th & 7th.	63·4	23rd	28·0
Bihar (South)	Gaya	374·5	29·583	+·050	29·917	29·737	31st	29·462	1st	·275	76·7	90·0	+0·6	69·8	−1·1	79·9	−0·3	20·2	93·4	2nd	63·2	31st	30·2
	Dehri	351·14	29·609	?	29·918	29·774	31st	29·483	1st	·291	77·9	89·4	?	68·9	?	79·2	?	20·5	91·3	6 dates	60·0	31st	31·3
	Patna	182·81	29·774	+·037	29·911	29·937	31st	29·652	1st	·285	78·7	88·9	+0·5	70·6	−2·0	79·8	−0·8	18·3	92·9	2nd	63·8	31st	29·1
	Arrah	190·02	29·767	?	29·912	29·928	31st	29·639	1st	·289	76·9	89·6	?	68·9*	?	79·3*	?	20·7	92·9	1st	60·3	31st	32·6
	Buxar	239·22	29·718	?	29·916	29·887	31st	29·581	1st	·306	77·6	88·9	?	69·6	?	79·3	?	19·3	91·4	19th	61·4	30th & 31st.	30·0
Bihar (North)	Purnea	125	29·838	+·051	29·919	29·969	31st	29·745	1st	·224	74·2	88·1	+0·3	66·0	−5·3	77·1	−2·5	22·1	92·7	2nd	58·3	31st	34·4
	Bhagalpur	160·78	29·790	?	29·904	29·951	31st	29·700	4th	·251	78·7	89·7	?	69·6	?	79·6	?	20·1	93·7	2nd	64·0	28th & 30th	29·7
	Darbhanga	166·32	29·801	+·045	29·924	29·946	31st	29·698	1st	·248	76·3	88·2	+2·0	69·2	−4·5	78·7	−1·3	19·0	92·0	1st & 2nd	63·5	31st	28·5
	Muzaffarpur*	178·42	29·758	?	29·892	29·860	30th	29·662	1st	·198	75·6	88·0	?	68·6	?	78·3	?	19·4	91·3	1st	62·3	29th & 30th.	29·0
	Motihari	223·61	29·723	?	29·908	29·888	31st	29·614	1st	·274	74·8	88·0	?	65·9	?	77·0	?	22·1	91·2	1st & 6th	56·9	31st	34·3
	Chapra	181·3	29·774	?	29·911	29·942	31st	29·655	1st	·287	77·7	89·5	?	68·7‡	?	79·2‡	?	20·8	92·3	2nd	61·6	31st	30·7
N.-W. P. (Eastern Districts).	Benares	266·97	29·688	+·047	29·918	29·851	31st	29·541	1st	·310	74·2	88·1	−2·4	67·1	−1·6	77·6	−2·0	21·0	91·8	18th & 25th.	58·4	31st	33·4
	Allahabad	309·28	29·638	+·036	29·909	29·806	31st	29·469	1st	·337	76·2	88·9	−1·0	67·1	−0·6	78·0	−0·8	21·8	92·4	18th	55·6	31st	36·8
N.-W. P. (Eastern Submontane).	Gorakhpur	255·93	29·692	+·044	29·914	29·848	31st	29·575	1st	·273	75·7	86·1	−2·8	69·3	−1·0	77·7	−1·9	16·8	88·9	7th	61·8	31st	27·1
Oudh (South)	Lucknow	369·7	29·575	+·036	29·913	29·720	31st	29·364	1st	·356	75·2	87·0	−4·2	65·9	+0·2	76·5	−2·0	21·1	91·8	25th	56·5	31st	35·3
N.-W. Provinces (Central).	Cawnpore	415·57	29·525	?	29·909	29·687	31st	29·311	1st	·376	76·1	87·2	?	67·6*	?	77·2*	?	19·6	91·5	17th	58·0	31st	33·5
VI.—Upper Sub-Himalayas		...	...	+·039	...	...	...	...	...	...	..	85·7	−4·7	62·6	+0·3	74·2	−2·2	23·1	...	...	...	...	...
N.-W. Provinces (Submontane).	Bareilly	568·47	29·362	+·040	29·912	29·512	31st	29·195	1st	·317	71·7	85·0	−4·6	65·7	+0·4	75·3	−2·1	19·3	88·3	17th & 18th.	57·7	29th & 30th.	30·6
	Dehra Dun	2,232·4	27·719	?	29·961	27·867	31st	27·576	1st	·291	65·2	79·7	?	59·4	?	69·6	?	20·3	84·5	1st	54·0	28th	30·5
	Roorkee	886·63	29·051	+·044	29·938	29·213	31st	28·882	1st	·331	68·2	85·5	−4·0	62·8	+1·3	74·2	−1·4	22·7	90·8	1st	54·9	30th	35·9
	Meerut	737·48	29·200	+·048	29·926	29·362	31st	29·047	1st	·315	70·0	85·8	−4·7	63·5	+0·6	74·7	−2·1	22·3	88·7	17th	55·0	30th	33·7
Punjab (Central)	Delhi	717·81	29·221	+·048	29·922	29·365	31st	29·078	1st	·287	73·0	86·1	−6·2	78·6	+0·5	77·4	−2·9	17·5	89·6	16th	62·1	31st	27·5
	Lahore	702·2	29·216	+·036	29·911	29·366	31st	29·070	1st	·296	71·2	89·4	−4·0	62·1	+0·5	75·8	−1·8	27·3	99·3	2nd	54·0	29th &	45·3

* Mean of 30 days.
† „ „ 29 „
‡ Mean fo 23 days.

I—*continued.*

in India, Burma, &c., in October 1891—continued.

Wind Direction. Number of winds from									Wind Velocity.			Hygrometry, 8 A.M.			Rainfall.										
Calm	N.	NE.	E.	SE.	S.	SW.	W.	NW.	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 October to 31st October 1891.	Normal rainfall for period 1st October to 31st October.	Variation from normal of period.	Station.	Meteorological Province or District.
11	...	...	2	1	1	3	...	13	2	?	?	67	?	0	1	...	...	0·34	3·91	− 3·57	0·34	3·91	− 3·57	Naya Dumka.	Central Bengal—*concld.*
4	5	1	7	...	3	2	6	3	2	2	0	83	·783	2·3	1	...	...	0·56	4·57	− 4·01	0·56	4·57	− 4·01	Berhampore.	
...	11	7	...	2	6	4	...	1	2	?	?	81	?	1·5	2	...	...	2·30	4·68	− 2·38	2·30	4·68	− 2·38	Rampur Boalia	
3	...	1	...	2	1	11	2	10	3	?	?	79	?	0·5	2	...	...	1·15	4·22	− 3·07	1·15	4·22	− 3·07	Malda.*	
9	6	4	5	1	1	1	3	1	2	?	?	81	·775	1·4	1	...	...	1·00	4·01	− 3·01	1·00	4·01	− 3·01	Bogra.	
...	1	9	3	...	1	7	5	5	2	?	?	79	·728	1·6	2	...	...	0·48	5·03	− 4·55	0·48	5·03	− 4·55	Dinajpur	North Bengal.
5	4	3	8	...	2	1	7	1	2	?	?	86	?	0·8	2	...	...	10·52	4·66	+ 5·86	10·52	4·66	+ 5·86	Rangpur.	
2	6	12	5	2	1	...	1	2	2	?	?	84	·720	0·4	3	...	...	1·44	5·40	− 3·96	1·44	5·40	− 3·96	Jalpaiguri.	
1	13	...	...	...	2	4	...	11	4	?	?	83	·784	1·0	1	...	..	1·03	6·19	− 5·16	1·03	6·19	− 5·16	Balasore	Orissa.
...	7	...	1	...	1	3	6	13	6	6	0	83	·846	2·9	1	...	...	1·19	8·82	− 7·63	1·19	8·82	− 7·63	False Point.	
6	3	3	..	...	2	5	6	6	2	2	0	74	·747	2·1	1	...	...	1·97	4·18	− 2·21	1·97	4·18	− 2·21	Cuttack.	
...	5	7	1	...	...	4	5	9	9	?	?	74	·848	1·7	0	...	...	0	?	?	0	?	?	Shortt's Island.	
...	21	2	...	...	...	5	1	1	8	?	?	80	?	1·7	1	...	...	0·62	8·20	− 7·58	0·62	8·20	− 7·58	Puri.	
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1·68	2·81	−1·07	...	...	...	**V.—Gangetic Plain and Chota Nagpur.**	
4	5	1	...	...	3	5	5	8	6	2	+ 00	65	·556	2·0	2	...	...	0·27	3·10	− 2·83	0·27	3·10	− 2·83	Hazaribagh.	Chota Nagpur.
11	4	...	...	...	2	6	2	6	4	?	?	72	?	3·5	2	...	...	0·47	3·07	− 2·60	0·47	3·07	− 2·60	Ranchi.	
7	...	3	2	1	...	12	5	1	1	?	?	82	·712	1·4	3	...	...	1·03	2·98	− 1·95	1·03	2·98	− 1·95	Chaibassa.	
...	1	...	2	...	21	1	6	...	5	2	+150	73	·680	4·5	3	...	...	1·81	2·37	− 0·56	1·81	2·37	− 0·56	Gaya	Bihar (South).
1	...	...	...	1	5	18	5	1	1†	?	?	72	?	1·1	1	...	...	0·50	?	?	0·50	?	?	Dehri.	
1	..	3	6	2	9	3	6	1	2	2	0	69	·685	2·0	4	...	...	1·72	3·12	− 1·40	1·72	3·12	− 1·40	Patna.	
...	3	2	3	2	5	4	8	4	1*	?	?	78	?	0·9	2	...	...	1·51	2·88	− 1·37	1·51	2·88	− 1·37	Arrah.	
2	1	1	4	1	1	3	9	9	3‡	?	?	72	?	1·8	3	...	...	1·20	3·10	− 1·90	1·20	3·10	− 1·90	Buxar.	
19	1	2	3	...	1	2	1	2	...	1	?	83	·713	1·2	2	...	...	0·98	3·69	− 2·71	0·98	3·69	− 2·71	Purnea	Bihar (North).
25	...	...	...	1	...	3	2	...	0	?	?	75	?	1·5	0	...	...	0·19	3·83	− 3·64	0·19	3·83	− 3·64	Bhagalpur.	
12	1	3	3	5	1	1	2	3	2	2	0	80	·722	0·9	1	...	...	1·02	3·59	− 2·57	1·02	3·59	− 2·57	Darbhanga.	
7	1	2	7	3	3	1	4	2	3	?	?	83	?	1·2	3	...	...	0·93	2·84	− 1·91	0·93	2·84	− 1·91	Muzaffarpur.	
3	1	6	7	4	...	2	5	3	4	?	?	81	?	2·1	3	...	...	3·98	3·45	+ 0·53	3·98	3·45	+ 0·53	Motihari.	
5	1	4	4	3	2	8	2	2	3	?	?	77	?	1·7	2	...	...	0·34	2·85	− 2·51	0·34	2·85	− 2·51	Chapra.	
22	1	...	...	1	1	3	3	...	3	3	0	82	·701	1·6	3	...	...	3·63	2·45	+ 1·18	3·63	2·45	+ 1·18	Benares	N.-W. P. (Eastern Districts).
10	3	1	...	1	4	1	7	4	2	2	0	78	·708	2·1	3	...	...	2·47	1·65	+ 0·82	2·47	1·65	+ 0·82	Allahabad.	
1	4	...	3	1	2	1	13	6	1	1	0	78	·702	1·9	3	...	...	7·51	3·80	+ 3·71	7·51	3·80	+ 3·71	Gorakhpur	N.-W. P. (East Submontane).
20	2	2	...	1	1	...	3	2	2	2	0	83	·733	1·7	3	...	...	1·95	0·73	+ 1·22	1·95	0·73	+ 1·22	Lucknow.	Oudh (South).
6	...	3	3	1	4	8	4	2	3	?	?	76	·699	1·8	1	...	...	0·35	1·08	− 0·73	0·35	1·08	− 0·73	Cawnpore	N.-W. Provinces (Central).
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1·57	0·49	+1·08	...	...	...	**VI.—Upper Sub-Himalayas.**	
24	...	1	...	2	...	1	1	2	1	2	− 50	82	·640	1·0	1	...	...	0·24	0·97	− 0·73	0·24	0·97	− 0·73	Bareilly	N.-W. Provinces (Submontane).
28	...	1	1	...	...	...	1	...	1	2	− 50	79	·498	2·2	4	...	...	3·43	0·85	+ 2·63	3·48	0·85	+ 2·63	Dehra Dun.	
21	2	...	1	1	3	...	1	2	1	1	0	84	·581	1·5	3	...	...	2·57	0·43	+ 2·14	2·57	0·43	+ 2·14	Roorkee.	
21	...	...	2	3	1	...	4	...	1	1	0	79	·586	1·0	3	...	...	2·89	0·60	+ 2·29	2·89	0·60	+ 2·29	Meerut.	
17	...	1	1	6	...	3	3	...	2	2	0	71	·576	1·1	3	...	...	0·46	0·17	+ 0·29	0·46	0·17	+ 0·29	Delhi	Punjab (Central).
15	2	...	8	5	...	...	...	1	2	2	0	66	·507	0·8	2	...	...	1·12	0·22	+ 0·90	1·12	0·22	+ 0·90	Lahore.	

* Mean of 30 days. † Mean of 24 days. ‡ Mean of 28 days. § Thirty days' wind direction observations.

Table

Abstract of Observations taken at 8 A M. at 161 stations

Meteorological Province or District.	Station.	Height of Station in feet.	Pressure 8 A.M. in inches. 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.	Temperature of Air. 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.
Punjab (Submontane).	Ludhiana	811·86	29·112	+·037	29·919	29·262	31st	28·982	1st	·280	70·0	88·3	−4·0	61·9	−2·1	75·1	−3·1	26·4	96·3	2nd	55·2	29th, 30th 31st.	41·1
Punjab (North)	Sialkot	829·47	29·080	+·038	29·909	29·226	31st	28·930	1st	·296	69·8	88·6	−3·9	63·2	+1·2	75·9	−1·4	25·4	97·6	2nd	55·9	30th	41·7
	Rawalpindi	1,648·9	28·287	+·028	29·931	28·421	31st	28·135	1st	·286	65·2	83·1	−5·5	56·3	0	69·7	−2·8	26·8	94·5	1st	46·5	29th	48·0
VII.—Indus Valley and N.-W. Rajputana.		...	...	+·027	...	...	...	...	...	...	...	94·6	−0·7	66·9	+1·6	80·8	+0·5	27·7	...	...	...	...	...
Punjab (West)	Peshawar	1110·4	28·867	+·053	29·949	29·025	31st	28·666	1st	·359	67·4	85·7	−3·2	58·6	+1·1	72·2	−1·1	27·1	97·5	2nd	50·0	28th & 29th.	47·5
	Khushab	611·51	29·302	?	29·901	29·465	31st	29·095	2nd	·370	72·5	91·4	?	62·6	?	77·0	?	28·8	102·0	2nd	55·1	29th.	46·9
	Montgomery	558·46	29·355	?	29·893	29·504	31st	29·170	2nd	·334	77·1	95·4	?	65·0	?	80·2	?	30·4	103·9	2nd	56·8	29th	47·1
	D. I. Khan	572·56	29·336	+·020	29·900	29·505	31st	29·126	2nd	·379	69·1	92·6	−1·8	63·4	+1·8	78·0	0	29·2	100·5	2nd	54·7	29th	45·8
	Mooltan	420·19	29·482	+·015	29·881	29·686	31st	29·296	2nd	·390	73·6	94·4	−0·4	67·0	+2·3	80·7	+1·0	27·4	105·2	2nd	55·2	29th	50·0
	Sirsa	661·61	29·255	+·028	29·901	29·415	31st	29·107	1st	·308	73·4	94·5	−1·7	65·1	+2·4	79·8	+0·4	29·4	101·4	2nd & 3rd	55·3	29th	46·1
Sind and Cutch	Jacobabad	185·9	29·724	+·021	29·876	29·879	31st	29·549	3rd	·330	74·7	99·2	+1·5	65·5	+2·8	82·4	+1·8	33·7	107·4	1st	57·9	29th	49·5
	Hyderabad	117·43	29·809	+·034	29·882	29·960	31st	29·669	4th	·291	77·6	98·9	+1·3	71·4	+0·6	85·2	+1·0	27·5	103·7	11th & 21st.	66·1	29th	37·6
	Kurrachee	49	29·898	+·018	29·900	30·017	31st	29·758	4th	·259	77·7	91·3	+0·1	72·4	+0·8	81·9	+0·5	18·9	99·9	8th	64·9	5th	35·0
	Bhuj	394·9	29·544	?	29·896	29·655	31st	29·442	4th	·213	82·0	97·6	?	72·8	?	85·2	?	24·8	101·9	26th	66·3	30th	35·6
Rajputana (West)	Bickaneer	743·5	29·003	?	29·714	29·067	2nd	28·920	30th	·147	77·9	95·1	?	72·8	?	84·0	?	22·3	101·6	2nd	61·9	31st	39·7
	Pachpadra	380	29·572	?	29·911	29·723	30th	29·455	1st	·268	80·5	98·8	?	66·1	?	82·5	?	32·7	102·5	11th & 23rd.	53·8	30th	48·7
VIII.—East Rajputana, Central India and Guzerat.		...	...	+·034	...	...	...	...	...	...	...	91·1	−0·9	67·2	−0·1	79·2	−0·5	23·9	...	...	..	...	...
Rajputana (East)	Jeypore	1430·6	28·520	+·021	29·937	28·676	31st	28·399	1st	·277	75·5	91·8	−1·4	65·4	+0·6	78·6	−0·4	26·4	96·1	16th & 17th.	54·1	29th & 30th.	42·0
	Sambhar	1253·52	28·668	+·009	29·912	28·823	31st	28·542	1st	·281	73·3	92·1	+0·5	64·2	−0·9	78·2	−0·2	27·9	96·0	13th & 16th.	53·9	30th	42·1
	Ajmere	1611	28·346	+·026	29·939	29·497	31st	28·230	1st	·267	76·5	94·2	+2·7	65·1	+2·0	79·7	+2·4	29·1	98·4	26th	54·2	29th, & 30th.	44·2
	Deesa	465·5	29·492	+·028	29·918	29·616	31st	29·419	23rd	·197	80·8	99·6	+3·6	68·6	+1·5	84·1	+2·6	31·0	103·4	21st & 25th.	59·9	29th & 30th.	43·5
Kathiawar	Rajkot	428·83	29·534	+·031	29·920	29·606	31st	29·453	4th	·153	80·3	95·8	+0·4	68·4	−0·1	82·1	+0·2	27·4	104·4	12th	59·9	30th	44·5
	Veraval	?	29·939	?	29·901	30·007	28th	29·868	23rd	·139	82·1	91·3	?	72·4	?	81·9	?	18·9	97·8	21st	66·8	30th	31·0
	Bhavnagar	?	29·545	?	29·531	29·626	31st	29·484	23rd	·142	79·9	93·3	?	73·2	?	83·3	?	20·1	97·4	1st & 2nd.	63·0	29th	34·4
Central India	Nowgong	757·04	29·200	+·043	29·934	29·343	31st	29·035	1st	·308	73·4	86·2	−4·7	65·5	0	75·8	−2·4	20·7	90·0	25th	55·3	31st	34·7
	Sutna	1,040·1	28·908	+·041	29·934	29·063	31st	28·746	1st	·317	73·3	85·1	−2·5	65·0	−0·7	75·1	−1·6	20·1	89·1	28th	55·7	31st	33·4
	Indore	1,823·2	28·140	+·038	29·939	28·258	31st	28·031	1st	·227	74·9	86·7	−0·4	62·6	−1·6	74·7	−1·0	24·1	91·0	27th, & 28th.	54·6	30th	36·4
	Neemuch	1,630	28·921	+·031	29·945	28·471	31st	28·222	1st	·249	75·1	89·9	0	65·1	+0·2	77·5	+0·1	24·8	93·8	13th & 18th.	54·8	29th & 31st.	39·0
Guzerat	Surat	36	29·946	+·049	29·927	30·001	19th	29·877	1st	·124	77·4	92·1	−0·2	69·4	−1·3	80·8	−0·8	22·7	97·2	28th	59·0	29th	38·2
N.-W. P. (West)	Agra	555·44	29·405	+·045	29·937	29·565	31st	29·248	1st	·317	73·7	88·3	−5·0	67·2	−1·1	77·8	−3·1	21·1	92·5	24th	59·1	30th	33·4
	Jhansi	840·13	29·101	+·050	29·917	29·245	31st	28·936	1st	·309	76·1	88·9	−3·7	68·5	0	78·7	−1·9	20·4	93·5	17th	61·9	30th & 31st.	31·6
IX.—Deccan	...	...	...	+·050	...	...	...	...	...	...	...	87·9	−0·3	65·1	1·2	76·6	−0·8	22·8	...	...	...	...	...
Bombay (Deccan)	Belgaum	2,524	27·425	+·027	29·900	27·504	28th	27·367	22nd	·137	72·4	83·3	+0·8	65·3	+0·2	74·3	+0·5	18·0	87·3	8th	59·9	22nd & 23rd.	27·4
	Sholapur	1,589·7	28·383	+·055	29·931	28·459	28th & 31st.	28·330	23rd	·129	77·5	90·6	+1·4	66·8	−1·2	78·7	+0·1	23·8	95·7	30th	59·1	11th	36·6
	Poona	1,840·37	28·139	+·047	29·952	28·195	28th	28·080	23rd	·115	74·3	89·8	+2·6	64·1	−2·6	77·0	0	25·7	94·0	4 days	57·9	24th	36·1
Khandeish	Malegaon	1,430·12	28·558	+·058	29·967	28·640	31st	28·504	22nd	·136	74·3	90·4	+0·9	62·9	−2·6	76·7	−0·9	27·5	94·9	3 days	56·4	14th	38·5
	Ahmednagar	2,151·62	27·836	?	29·951	27·904	31st	27·782	23rd	·122	74·4	86·8	?	62·5	?	74·7	?	24·3	90·8	27th	54·5	24th	36·3
Berar	Akola	930	29·049	+·063	29·951	29·15[illegible]	31st	28·969	1st	·181	74·1	89·5	−0·6	63·4	−2·8	76·5	−1·7	26·1	93·9	3 days	56·5	23rd	37·4
	Amraoti	1,215·5	28·753	+·059	29·943	28·857	31st	28·679	1st	·178	74·9	88·5	−1·0	67·5	0	78·0	−0·5	21·0	94·3	28th	64·3	12th	30·0

I—*continued.*

in India, Burma, &c., in October 1891—continued.

Wind Direction. Number of winds from									Wind Velocity.			Hygrometry, 8 A.M.		Mean cloud amount.	Rainfall.							Station.	Meteorological Province or 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 October to 31st October 1891.	Normal rainfall for period 1st October to 31st October.	Variation from normal of period.		
20	1	...	3	5	1	...	1	...	1	1	0	74	·552	2·3	1	...	...	1·40	0·42	+0·98	1·40	0·42	+ 0·98	Ludhiana	Punjab (Submontane).
10	8	3	9	...	...	...	...	1	2	1	+100	65	·477	1·6	4	...	...	0·96	0·21	+0·75	0·96	0·21	+ 0·75	Sialkot	Punjab (North).
10	1	6	1	1	...	3	1	8	2	1	+100	72	·455	1·8	2	...	...	0·98	0·52	+0·46	0·98	0·52	+ 0·46	Rawalpindi.	
...	...	...	...	...	..	...	...	...	...	..	...	...	...	...	...	...	...	0·02	0·12	−0·09	...	...	...	**VII.—Indus Valley and N.-W. Rajputana.**	
13	4	2	...	1	4	5	2	...	3	3	0	68	·457	2·2	2	...	...	0·20	0·12	+0·08	0·20	0·12	+ 0·08	Peshawar	Punjab (West).
14	3	8	3	...	1	...	...	2	4	?	?	53	·435	0·4	0	...	...	0·03	0·07	−0·04	0·03	0·07	− 0·04	Khushab	
3	...	6	6	8	6	1	1	...	6	?	?	53	·505	1·0	0	...	...	0	0·06	−0·06	0	0·06	− 0·06	Montgomery.	
17	1	6	4	...	...	...	...	3	1	1	0	62	·447	0·7	0	...	...	0	0·04	−0·04	0	0·04	− 0·04	D. I. Khan.	
17	...	5	1	6	...	1	...	1	1	2	− 50	63	·525	0·7	0	...	...	0	0	0	0	0	0	Mooltan.	
1	...	1	8	1	14	4	2	...	5	3	+ 67	74	·615	0·9	0	...	...	0·06	0·19	−0·13	0·06	0·19	− 0·13	Sirsa.	
18	3	1	5	1	...	...	...	3	2	2	0	50	·429	0·4	0	...	...	0	0	0	0	0	0	Jacobabad	Sind and Cutch.
...	2	6	1	2	...	17	2	1	8	8	0	53	·493	0·6	0	...	...	0	0	0	0	0	0	Hyderabad.	
...	5	4	5	...	...	1	11	5	10	10	0	77	·745	0·7	0	...	...	0	0	0	0	0	0	Kurrachee.	
2	2	...	2	...	...	3	15	7	8	6	+ 33	59	·642	0·6	0	...	...	0	0·80	−0·80	0	0·80	− 0·80	Bhuj.	
...	1	6	...	6	6	10	2	...	5	4	+ 25	41	·399	0·5	0	...	...	0	0·08	−0·08	0	0·08	− 0·08	Bickaneer	Rajputana (West).
10	2	1	5	...	5	5	2	1	?	4	?	39	·418	1·1	0	...	...	0	0·05	−0·05	0	0·05	− 0·05	Pachpadra.	
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·66	0·88	−0·11	...	...	...	**VIII.—East Rajputana, Central India and Guzerat.**	
13	3	6	2	...	...	1	3	3	3	4	−25	60	·540	1·3	1	...	...	0·69	0·36	+0·33	0·69	0·36	+ 0·33	Jeypore	Rajputana (East)
17	2	5	3	2	1	...	1	...	5	5	0	59	·492	1·0	1	...	...	0·33	0·22	+0·11	0·33	0·22	+ 0·11	Sambhar.	
7	...	2	...	1	1	11	9	...	4	3	+33	53	·479	0·6	1	...	...	0·12	0·25	−0·13	0·12	0·25	− 0·13	Ajmere.	
...	2	3	8	10	3	3	1	1	7	7	0	48	·505	1·2	0	...	...	0	0·40	−0·40	0	0·40	− 0·40	Deesa.	
12	3	2	3	1	...	1	6	3	5	6	−17	68	·693	0·3	1	...	...	0·41	0·39	+0·02	0·41	0·39	+ 0·02	Rajkot	Kathiawar.
14	12	5	...	...	...	...	...	...	6	?	?	61	·666	1·0	0	...	...	0·05	?	?	0·05	?	?	Veraval.	
...	...	7	2	1	2	15	4	...	7	?	?	80	·822	1·3	0	...	...	0·02	?	?	0·02	?	?	Bhavnagar.	
9	1	2	3	...	1	2	12	1	3	2	+50	75	·624	2·1	4	...	...	1·96	1·14	+0·82	1·96	1·14	+ 0·82	Nowgong.	Central India.
8	9	2	...	1	1	1	6	3	5	4	+25	80	·662	2·0	3	...	...	3·28	2·22	+1·06	3·28	2·22	+ 1·06	Sutna.	
15	1	1	5	2	...	2	4	1	2	2		66	·576	0·5	2	...	...	0·72	1·82	−1·10	0·72	1·82	− 1·10	Indore.	
7	1	...	2	1	1	9	9	1	7	8	−12	62	·541	0·9	1	...	...	0·27	0·73	−0·46	0·27	0·73	− 0·46	Neemuch.	
...	...	12	...	5	4	9	...	1	?	5	?	76	·721	1·8	1	...	...	0·18	1·75	−1·57	0·18	1·75	− 1·57	Surat	Guzerat.
7	1	2	...	6	1	7	...	7	3	3	0	73	·616	1·0	3	...	...	0·97	0·45	+0·52	0·97	0·45	+ 0·52	Agra	N.-W. P. (West).
6	1	1	...	1	5	13	1	3	2	3	−33	66	·599	0·9	2	..	...	0·29	0·79	−0·50	0·29	0·79	− 0·50	Jhansi.	
...	...	...	..	...	...	...	...	...	...	...	..	...	...	...	...	...	...	2·40	3·02	−0·41	...	...	...	**IX.—Deccan.**	
2	2	6	9	5	1	...	3	3	3	10	−70	74	·589	5·0	12	...	...	7·84	5·30	+2·54	7·84	5·30	+ 2·54	Belgaum	Bombay (Deccan).
...	4	8	8	6	2	...	1	2	7	8	−12	65	·614	4·4	4	...	...	5·78	4·50	+1·28	5·78	4·50	+ 1·28	Sholapur.	
20	...	...	8	2	...	...	1	...	7	6	+17	61	·523	3·0	5	...	...	3·24	4·31	−1·07	3·24	4·31	− 1·07	Poona.	
10	1	1	3	...	1	4	8	3	4	5	−20	64	·537	2·7	3	...	...	1·79	3·52	−1·73	1·79	3·52	− 1·73	Malegaon	Khandeish.
2	4	6	6	6	2	1	2	2	5	?	?	71	·608	1·9	3	...	...	2·03	3·10	−1·07	2·03	3·10	− 1·07	Ahmednagar.	
6	1	9	4	5	...	1	1	4	4	3	+33	72	·605	2·5	2	...	...	1·50	3·63	−2·13	1·50	3·63	− 2·13	Akola	Berar.
1	1	14	7	1	...	2	5	...	4	3	+33	65	·565	2·0	2	...	...	3·34	2·94	+0·40	3·34	2·94	+ 0·40	Amraoti	

Table

Abstract of Observations taken at 8 A.M. at 161 stations

Meteorological Province or District.	Station.	Height of Station in feet.	Pressure 8 A.M. in inches. 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.	Temperature of Air. 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.
Central Provinces (West).	Khandwa	1,043·71	28·925	+·057	29·951	29·040	31st	28·829	1st	·211	72·9	88·0	−1·9	64·6	−1·7	76·3	−1·8	23·4	93·7	27th	56·1	31st	37·6
	Hoshangabad	1,020	28·960	+·048	29·964	29·095	31st	28·839	1st	·256	72·0	87·2	−2·1	66·3	−0·9	76·8	−1·5	20·9	90·8	27th	60·3	31st	30·5
	Nagpur	1,025	28·939	+·060	29·938	29·053	31st	28·848	1st	·205	76·3	88·0	−1·7	67·2	−1·2	77·6	−1·5	20·8	92·3	28th	62·8	12th	29·5
Central Provinces (Central).	Seoni	2,030	27·938	+·044	29·972	28·045	31st	27·834	1st	·211	73·4	85·7	−0·7	61·3	−3·2	73·5	−2·0	24·4	88·6	27th & 28th.	52·9	31st	35·7
	Jubbulpore	1,327·02	28·637	+·056	29·955	28·774	31st	28·502	1st	·272	71·0	85·4	−1·9	64·1	−0·1	74·8	−1·0	21·3	90·9	28th	54·4	31st	36·5
	Saugor	1,751·5	28·194	+·026	29·941	28·322	31st	28·053	1st	·269	72·8	86·6	−0·3	64·5	−0·9	75·6	−0·6	22·1	90·3	27th	56·3	30th	34·0
Central Provinces (East).	Raipur	959·7	28·995	+·060	29·933	29·108	31st	28·906	1st	·202	75·9	86·7	−1·4	69·0	−0·7	77·9	−1·1	17·7	91·0	29th	62·7	31st	28·3
Hyderabad, (North).	Aurangabad*	?	28·144	?	?	28·222	31st	28·075	22nd	·147	75·9	89·2	?	63·5	?	76·5	?	25·7	97·5	26th	59·8	13th	37·7
	Gulburga†	?	28·460	?	?	28·527	31st	28·388	23rd	·139	76·5	90·3	?	66·4	?	78·4	?	23·9	92·3	26th	60·2	23rd	32·1
Hyderabad (South).	Secunderabad	1,786·69	28·172	+·036	29·923	28·263	31st	28·104	23rd	·159	76·1	89·1	+2·1	68·1	+0·4	78·6	+1·3	21·0	92·1	3 days	62·0	18th & 23rd.	30·1
X.—West Coast		...	...	+·008	...	...	...	...	...	...	...	87·1	+1·7	72·8	−0·7	80·0	+0·5	14·3	...	...	...	...	...
Konkan	Bombay	37	29·928	+·035	29·905	29·995	28th	29·869	22nd	·126	79·6	88·1	+0·8	76·4	+0·1	82·2	+0·5	11·7	91·4	27th	73·0	30th	18·4
	Ratnagiri	110	29·824	+·031	29·873	29·886	28th	29·770	23rd	·116	81·9	90·6	+2·5	71·3	−2·2	81·0	+0·2	19·3	97·4	12th	67·9	21st	29·5
	Mormugao	?	29·875	?	29·871	29·952	28th	29·820	16th	·132	79·3	87·0	?	75·4	?	81·2	?	11·6	91·0	11th	75·4	3 days	17·6
	Karwar	43·87	29·890	+·007	29·871	29·959	28th	29·831	22nd	·128	75·4	87·5	+2·5	71·3	−1·8	79·4	+0·4	16·2	90·3	4 days	67·4	24th & 25th.	22·9
Malabar	Mangalore	25·60	29·917	+·001	29·876	29·988	28th	29·860	22nd	·128	78·1	86·4	+1·3	74·3	+0·1	80·4	+0·7	12·1	92·3	8th	68·5	24th	23·8
	Calicut	26·58	29·903	−·017	29·861	29·977	28th	29·829	22nd	·148	79·3	87·3	?	74·7	?	81·0	?	12·6	90·3	10th	71·6	23rd	18·7
	Cochin	10·38	29·925	−·007	29·865	29·987	28th	29·870	22nd	·117	80·0	87·1	+1·3	74·5	+0·1	80·8	+0·7	12·6	90·3	9th	72·7	23rd & 24th.	17·6
	Trivandrum	?	29·593	?	29·871	29·638	28th	29·545	11th	·093	77·3	82·9	?	64·3	?	73·6	?	18·6	86·5	1st	61·5	23rd	25·0
XI.—South India		...	...	+·031	...	...	...	...	...	...	...	87·6	−0·3	73·0	+0·1	80·3	−0·1	14·7	...	...	...	...	...
Madras (South)	Pamban	37	29·895	?	29·933	29·972	31st	29·815	23rd	·157	80·5	85·5	?	76·2	?	80·9	?	9·3	89·3	7th	70·2	23rd	19·1
	Madura	446·60	29·480	+·018	29·869	29·552	28th & 31st.	29·395	23rd	·157	77·9	87·9	−4·3	73·4	−0·5	80·7	−2·4	14·5	96·4	7th	70·5	3rd & 4th.	25·9
Madras (South Central).	Salem	939·91	29·015	+·012	29·906	29·100	28th	28·922	22nd	·178	77·8	90·0	+0·7	71·7	+1·4	80·9	+1·1	18·3	94·4	11th & 14th.	67·9	23rd & 24th.	26·5
	Coimbatore	1,347·64	28·581	+·005	29·891	28·670	28th	28·517	22nd	·153	74·9	85·8	−2·3	70·7	0	78·3	−1·2	15·1	89·3	2nd	67·1	23rd	22·2
Coorg	Mercara	3,780·7	26·245	?	29·884	26·321	28th	26·188	23rd	·133	67·0	77·0	+1·5	62·6	+0·3	69·8	+0·9	14·4	81·3	11th	57·7	24th, & 25th.	23·6
Mysore	Bangalore	2,981·46	27·020	+·017	29·934	27·101	28th	26·943	23rd	·158	71·3	82·5	+1·5	65·5	+0·7	74·0	+1·1	17·0	88·2	1st	58·9	30th	29·3
Madras (East Coast, South).	Negapatam	30·5	29·893	+·013	29·855	29·970	28th	29·765	22nd	·205	79·9	87·7	−0·3	75·4	−0·1	81·5	−0·2	12·3	96·2	12th	68·7	23rd	27·5
	Cuddalore	12·44	29·913	?	29·856	30·006	28th	29·774	22nd	·232	79·1	86·1	?	75·1	?	80·6	?	11·0	92·2	1st & 2nd.	70·2	23rd	22·0
	Trichinopoly	254·78	29·675	+·015	29·868	29·758	28th.	29·578	22nd	·180	78·8	88·1	−2·9	74·5	+0·5	81·3	−1·2	13·6	96·1	2nd	66·4	23rd	29·7
	Madras	22	29·926	+·034	29·881	30·021	28th	29·784	23rd	·237	80·8	88·3	−0·5	75·5	+0·5	82·0	0	12·8	94·5	1st & 10th.	72·5	18th & 19th.	22·0
Madras (East Coast, Central).	Nellore	70·82	29·865	?	29·873	29·962	31st	29·758	23rd	·204	81·8	90·5	?	75·9	?	83·2	?	14·6	97·2	1st	72·1	29th & 30th.	25·1
	Masulipatam	15·0	29·942	+·049	29·894	30·029	31st	29·837	23rd	·202	80·9	89·0	−0·4	76·1	+0·4	82·6	0	12·9	93·6	1st	72·6	12th & 29th.	21·0
Madras (Central)	Cuddapah	433·36	29·520	?	29·897	29·619	28th	29·419	23rd	·200	81·4	92·2	?	73·9	?	83·1	?	18·3	98·7	11th	68·5	30th	30·2
	Kurnool	923·45	29·028	?	29·903	29·131	28th	28·971	23rd	·160	79·8	92·8	?	70·6	?	81·7	?	22·2	95·5	2nd	62·3	21st	33·2
	Bellary	1,474·63	28·478	+·045	29·913	28·561	28th	28·430	16th & 23rd.	·131	77·4	92·3	+2·6	70·9	+0·1	81·6	+1·4	21·4	96·4	7th	65·5	30th	30·9
Madras (East Coast, North).	Rajahmundry	112	29·805	?	29·855	29·925	31st	29·740	23rd	·185	77·6	88·6	?	72·2	?	80·4	?	16·4	94·0	29th	71·0	19th	23·0
	Cocanada	26	29·928	?	29·890	30·023	31st	29·828	23rd	·195	80·8	87·6	?	74·7	?	81·2	?	12·9	91·2	9th	70·6	26th	20·6
	Vizagapatam	31	29·927	+·053	29·897	30·033	31st	29·838	22nd	·195	82·5	85·7	−0·2	78·7	+1·5	82·2	+0·7	7·0	88·4	8th	74·9	27th	13·5
	Gopalpur	21·45	29·944	+·080	29·906	30·057	31st	29·856	22nd	·201	79·3	87·5	+0·8	73·1	−4·0	80·3	−1·6	14·4	89·7	7th	68·9	25th	20·8
XII.—Hill Stations		...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Beluchistan	Quetta	5,502·26	24·758	+·053	?	24·841	28th	24·648	4th	·193	57·3	74·3	−1·0	40·9	+1·3	57·6	+0·2	33·4	83·2	2nd	31·8	28th	51·4
	Shebo‡	?	?	?	?	?	?	?	?	?	56·4	76·4	?	50·6	?	63·5	?	25·8	86·5	1st	34·1	6th	52·4

* Mean of 25 days.
† " " 15 "
‡ " " 17 "

I—*continued.*

in India, Burma, &c., in October 1891—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 October to 31st October 1891.	Normal rainfall for period 1st October to 31st October.	Variation from normal of period.	Station.	Meteorological Province or District.
13	5	4	3	...	1	1	2	2	2	3	− 33	71	·580	0·9	2	...	...	1·65	1·97	−0·32	1·65	1·97	−0·32	Chandwa	Central Provinces (West).
7	2	4	3	...	13	2	...	...	3	2	+ 50	79	·634	1·7	4	...	...	6·05	2·08	+3·97	6·05	2·08	+3·97	Hoshangabad	
16	8	3	1	...	...	1	...	2	4	4	0	67	·601	2·1	2	...	...	0·59	3·02	−2·43	0·59	3·02	−2·43	Nagpur.	
...	2	8	6	4	2	4	3	2	1	3	− 67	74	·612	1·8	2	...	...	0·85	1·98	−1·13	0·85	1·98	−1·13	Seoni	Central Provinces (Central).
12	...	1	1	6	8	1	2	...	1	2	− 50	83	·634	2·1	1	...	...	0·51	2·07	−1·56	0·51	2·07	−1·56	Jubbulpore.	
...	5	2	2	3	7	9	1	2	2	3	− 33	72	·580	1·3	4	...	...	1·96	1·74	+0·22	1·96	1·74	+0·22	Saugor.	
8	8	5	1	...	1	4	3	1	4	4	0	75	·673	2·6	4	...	...	1·15	2·47	−1·32	1·15	2·47	−1·32	Raipur	Central Provinces (East).
8	...	1	7	9	...	1	...	...	5††	?	?	52	·481	1·8	1	...	...	1·77	?	?	1·77	?	?	Aurangabad*	Hyderabad (North).
3	...	6	3	3	1	...	...	...	8‡‡	?	?	63	·578	3·9	0	...	...	0	?	?	0	?	?	Gulburga.†	Hyderabad (South).
3	...	16	10	1	1	...	...	...	4	4	0	74	·673	3·3	4	...	...	0·83	2·70	−1·87	0·83	2·70	−1·87	Secunderabad	
...	...	...	...	...	...	...	...	.	...	...	...	...	...	..	...	...	...	10·25	7·48	+2·23	...	...	...	**X.—West Coast.**	
...	1	11	18	1	...	...	...	...	10	10	0	79	·809	2·6	3	...	...	1·16	2·84	−1·68	1·16	2·84	−1·68	Bombay	Konkan.
5	7	5	8	4	2	...	...	...	7	7	0	68	·737	2·4	4	...	...	1·41	4·00	−2·59	1·41	4·00	−2·59	Ratnagiri.	
5	1	1	15	3	5	...	..	1	5	?	?	85	·856	2·9	7	...	...	4·71	?	?	4·71	?	?	Mormugao.	
10	2	17	...	...	...	...	2	...	2	?	?	87	·787	3·7	12	...	...	6·72	7·66	−0·94	6·72	7·66	−0·94	Karwar.	
8	1	6	11	3	1	...	...	1	2	3	− 33	91	·875	6·4	11	...	...	7·23	7·48	−0·25	7·23	7·48	−0·25	Mangalore	Malabar.
9	1	7	9	3	...	..	1	1	9	?	?	84	·839	6·7	14	...	...	14·66	9·16	+5·50	14·66	9·16	+5·50	Calicut.	
9	2	16	1	1	1	...	...	1	4	?	?	84	·864	6·3	19	...	...	27·09	13·73	+13·36	27·09	13·73	+13·36	Cochin.	
...	8	5	...	2	1	1	7	6	6	?	?	87	·824	8·9	17	...	...	19·01	?	?	19·01	?	?	Trivandrum.§	
...	...	..	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...	7·86	8·16	−1·06	...	...	...	**XI.—South India.**	
4	7	5	3	1	1	1	2	7	5	?	?	81	?	6·8	20	...	...	21·53	?	?	21·53	?	?	Pamban	Madras (South).
7	9	8	...	1	...	...	...	6	1	3	− 67	71	·683	6·7	20	...	..	14·57	6·74	+7·83	14·57	6·74	+7·83	Madura.	
12	1	9	1	...	4	3	...	1	2	3	− 33	83	·800	5·6	8	...	...	3·64	7·42	−3·78	3·64	7·42	−3·78	Salem	Madras (South (Central).
...	10	4	2	1	7	3	1	3	2	3	− 33	93	·818	7·3	18	...	...	15·20	5·72	+9·48	15·20	5·72	+9·48	Coimbatore.	
...	8	3	17	...	...	...	2	1	5	4	+ 25	87	·582	7·5	17	...	...	10·75	9·61	+1·14	10·75	9·61	+1·14	Mercara	Coorg.
...	5	8	14	...	...	...	4	...	6	4	+ 50	79	·607	7·2	9	...	...	7·42	7·69	−0·27	7·42	7·69	−0·27	Bangalore	Mysore.
1	3	3	6	1	1	1	8	7	3	4	− 25	84	·857	7·9	19	...	...	15·75	11·69	+4·06	15·75	11·69	+4·06	Negapatam.	Madras (East Coast, South).
...	7	3	2	1	1	1	4	12	2	?	?	91	·907	5·6	18	...	...	18·65	9·11	+9·54	18·65	9·11	+9·54	Cuddalore.	
9	3	8	...	...	...	1	5	5	4	4	0	85	·834	8·8	14	...	...	10·69	6·21	+4·48	10·69	6·21	+4·48	Trichinopoly.	
1	10	5	3	3	1	1	2	5	5	5	0	84	·885	6·6	15	...	...	13·42	12·62	+0·80	13·42	12·62	+0·80	Madras.	
5	2	1	...	8	...	2	...	13	5	?	?	85	·924	8·5	7	...	...	2·85	10·25	−7·40	2·85	10·25	−7·40	Nellore	Madras (East Coast, Central).
5	13	9	...	1	3	...	...	...	4	4	0	84	·881	4·3	6	...	...	4·52	8·44	−3·92	4·52	8·44	−3·92	Masulipatam	
...	5	11	7	3	...	1	2	2	?	?	?	73	·773	4·7	4	...	...	2·91	6·33	−3·42	2·91	6·33	−3·42	Cuddapah	Madras (Central)
27	...	...	1	...	...	...	3	...	?	?	?	70	·709	1·7	4	...	...	2·06	4·93	−2·87	2·06	4·93	−2·87	Kurnool.	
18	...	...	4	8	...	...	...	1	5	4	+ 25	69	·662	5·1	5	...	...	1·18	4·06	−2·88	1·18	4·06	−2·88	Bellary.	
4	19	2	...	...	1	...	1	3	?	?	?	75	·790	3·5	3	...	...	0·70	6·60	−5·90	0·70	6·60	−5·90	Rajahmundry§	Madras (East Coast, North).
2	15	9	...	2	...	...	1	2	8	?	?	73	·770	2·1	2	...	...	0·71	8·81	−8·10	0·71	8·81	−8·10	Cocanada.	
...	7	2	...	...	1	...	13	8	2	2	0	72	·802	3·5	5	...	...	1·50	10·30	−8·80	1·50	10·30	−8·80	Vizagapatam	
...	12	...	...	...	1	3	1	14	10	6	+ 67	80	·792	0·8	2	...	...	1·29	10·39	−9·10	1·29	10·39	−9·10	Gopalpur.	
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	**XII.—Hill Stations.**	
29	2	...	...	...	...	...	...	...	1	3	− 67	44	·212	0·8	1	...	...	0·17	0·07	+0·10	0·17	0·07	+010	Quetta	Beluchistan.
12	...	3	3	3	3	1	2	...	?	?	?	57	·631	0·5	1	...	...	0·26	?	?	0·26	?	?	Shebo.‡	

* Mean of 26 days.
† „ „ 16 „

†† Mean of 25 days.
‡‡ „ „ 15 „
‡ „ „ 27 „

§ Thirty days wind direction observations.

Table

Abstract of Observations taken at 8 A.M. at 161 stations

Meteorological Province or District.	Station.	Height of Station 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.
Northern India	Srinagar†	5,203·7	25·033	?	?	25·208	12th	24·963	9th	·245	46·0	62·1	?	41·8	?	52·0	?	20·3	70·3	10th	34·1	29th	36·2
	Murree	6,343·86	23·958	+·039	?	24·040	12th	23·858	2nd	·188	54·4	64·4	−5·4	49·5	−3·9	57·0	−4·7	14·9	73·6	1st	39·7	11th.	33·9
	Simla	7,274	23·136	+ 006	?	23·224	31st	23·059	4th	·165	52·3	59·0	?	48·5	?	53·7	?	10·5	67·5	1st	44·1	5th&28th.	23·4
	Mussooree	?	23·628	?	?	23·713	31st	23·525	10th	·188	55·0	61·4	−3·0	47·4	−4·6	54·4	−3·8	14·0	65·2	4 days.	38·0	27th	27·2
	Ranikhet	6,068·75	24·165	+·020	?	24·242	1st	24·067	1st	·175	56·4	66·3	−3·1	52·0	−2·2	59·2	−2·7	14·3	69·6	1st	45·5	27th	24·1
	Gnatong	?	19·268	?	?	19·371	20th	19·177	22nd	·194	47·7	57·4	?	25·7	?	41·5	?	31·7	64·3	9th	14·1	29th	50·2
	Darjeeling	7,421·1	23·057	−·003	?	23·104	12th	22·988	22nd	·116	53·5	60·0	−0·8	48·4	−0·6	54·2	−0·7	11·6	64·6	1st	42·7	29th	21·9
Central India	Mount Abu	3,945	26·143	+·024	?	26·244	31st	26·025	4th	·219	72·0	78·8	−0·5	64·5	+0·2	71·7	−0·2	14·3	81·7	3 days.	59·4	4th & 5th	22·3
	Pachmarhi	3,511	26·551	+·047	?	26·644	31st	26·443	1st	·201	71·1	77·0	−0·4	58·1	−2·0	67·6	−1·2	18·9	80·7	3 days.	52·2	14th&31st	28·5
South India	Wellington	6,200	24·286	+·037	?	24·365	28th	24·194	23rd	·171	61·9	68·8	+0·2	55·4	+0·2	62·1	+0·2	13·4	71·2	3 days.	53·2	1st	18·0
XIII.—Extra India		...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Persia	Bushire*	14·0	29·947	?	29·918	30·076	28th	29·801	1st	·275	82·0	89·6	?	74·3	?	?	?	15·3	96·5	16th	68·1	31st	28·4
Arabia	Baghdad	?	29·475	?	?	29·615	6th	29·400	15th	·215	74·5	96·3	?	59·8	?	78·1	?	36·5	108·0	1st	50·0	31st	58·0
	Aden	94·1	29·868	?	29·894	29·935	28th	29·793	1st	·142	83·4	89·8	?	78·9	?	?	?	10·9	96·7	1st & 2nd	73·5	27th	23·2
Arabian Sea Islands.	Minicoy	10·46	29·939	?	29·874	30·034	28th	29·891	11th	·143	80·0	84·5	?	78·0	?	81·3	?	6·5	89·1	15th	74·4	19th	14·7
Africa	Zanzibar	73	29·994	?	?	30·086	2nd	29·941	15th	·145	77·5	82·9	?	74·9	?	78·9	?	8·0	85·7	27th	72·3	1st	13·4

* Mean of 30 days.
† „ „ 23 „

I—*concluded.*

in India, Burma, &c., in October 1891—concluded.

Wind Direction. Number of winds from									Wind Velocity.			Hygrometry, 8 A.M.		Mean cloud amount.	Rainfall.									Station.	Meteorological Province or 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 October to 31st October 1891.	Normal rainfall for period 1st October to 31st October.	Variation from normal of period.		
6	1	1	1	7	4	1	...	2	2	?	?	88	·284	4·7	5	...	...	0·99	?	?	0·99	?	?	Srinagar .	Northern India.
11	2	3	3	7	...	...	...	5	8	6	+ 33	50	·215	3·7	7	...	...	8·02	1·11	+6·91	8·02	1·11	+6·91	Murree.	
6	18	3	1	1	1	...	...	1	?	2	?	55	·215	1·7	5	...	...	5·50	0·83	+4·67	5·50	0·83	+4·67	Simla.	
...	5	2	15	4	1	...	1	3	?	8	?	78	·341	1·7	7	...	...	2·60	0·74	+1·86	2·60	0·74	+1·86	Mussooree.	
22	...	...	2	1	2	3	1	...	2	2	0	75	·338	1·9	5	...	...	1·35	1·04	+0·31	1·35	1·04	+0·31	Ranikhet.	
?	?	?	?	?	?	?	?	?	?	?	?	53	·179	?	11	...	...	5·74	?	?	5·74	?	?	Gnatong.	
12	1	8	7	1	1	1	...	...	5	3	+67	85	·350	4·1	1	...	...	0·88	5·04	−4·16	0·88	5·04	−4·16	Darjeeling.	
3	6	2	1	1	...	3	10	5	5	4	+25	41	·320	0·4	0	...	...	0·02	0·87	−0·85	0·02	0·87	−0·85	Mount Abu .	Central India.
19	...	2	3	...	...	2	3	2	3*	3	0	57	·431	2·2	4	...	...	1·19	2·87	−1·68	1·19	2·87	−1·68	Pachmarhi.	
17	2	2	2	4	2	...	2	...	2	3	−33	81	·451	7·7	23	...	...	38·80	11·35	+27·45	38·80	11·35	+27·45	Wellington .	South India.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	.	...	...	**XIII.—Extra India.**	
...	1	7	6	5	1	1	1	8	6†	?	?	63	·694	0	0	...	...	0	0	0	0	0	0	Bushire.*	Persia.
...	22	1	...	2	4	...	1	1	6	?	?	58	·510	0	0	...	...	0·05	0	+0·05	0·05	0	+0·05	Baghdad.	Arabia.
7	...	11	12	...	...	...	...	1	12	13	−7	67	·765	2·7	1	...	..	0·18	0	+0·18	0·18	0	+0·18	Aden.	
4	3	4	4	...	2	6	6	2	10	?	?	84	·859	6·6	17	...	...	15·56	?	?	15·56	?	?	Minicoy .	Arabian Sea Islands.
1	...	...	1	6	17	6	...	...	?	4	?	85	·797	6·9	8	...	...	4·39	?	?	4·39	?	?	Zanzibar .	Africa.

* Mean of 30 days. † Mean of 29 days.

Table

Abstract of Observations recorded at 10 A.M. and 4 P.M. at 89 stations

Station.	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 to 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.
Murree	23·984	23·953	·031	23·960	+ ·046	29+ ?	64·3	49·5	14·8	72·6	43·3	29·3	58·8	58·8	55·3	− 4·1	43·0	49·3	50·2	47·5
Chamba	27·005	26·922	·083	26·971	+ ·021	?	77·8	53·4	24·4	82·4	47·7	34·7	65·2	71·0	62·5	− 2·8	50·9	56·6	62·0	56·5
Kailang	20·852	20·794	·058	20·831	+ ·023	?	58·5	29·8	28·6	71·4	24·7	46·7	47·6	49·9	40·6	− 1·7	27·9	38·5	39·3	35·2
Simla	23·160	23·108	·051	23·125	+ ·005	?	58·5	48·4	10·3	64·5	44·1	20·4	54·2	55·7	52·5	− 4·2	42·0	46·7	48·8	45·6
Peshawar	28·875	28·777	·098	28·819	+ ·040	·935	85·2	58·6	26·6	97·5	50·0	47·5	76·7	82·3	70·5	− 0·4	54·4	64·1	65·5	61·3
Lahore	29·236	29·146	·090	29·185	+ ·033	·870	89·1	62·1	27·0	99·3	54·0	45·3	81·0	86·9	74·4	+ 0·2	59·2	67·5	68·6	65·1
Ludhiana	·124	·027	·098	·068	+ ·023	·862	88·3	62·0	26·3	95·6	55·1	40·5	79·2	85·0	73·8	− 1·5	60·6	67·9	68·2	65·6
Mooltan	·504	·399	·105	·445	+ ·009	·835	94·1	67·0	27·1	105·2	55·2	50·0	79·9	93·3	79·6	+ 2·5	60·4	69·0	76·6	68·7
Jacobabad	·749	·625	·123	·680	+ ·014	·826	99·1	65·5	33·6	111·3	57·7	53·6	88·2	96·5	81·0	+ 2·9	57·9	67·7	69·4	65·0
Hyderabad	·812	·711	·101	·762	+ ·013	·831	98·7	71·4	27·3	105·6	66·1	37·5	89·7	95·5	84·5	+ 1·7	64·3	67·3	68·5	66·7
Kurrachee	·906	·813	·093	·860	+ ·007	·862	91·4	72·6	18·8	99·9	65·0	34·9	85·9	87·2	80·9	+ 1·4	68·7	75·4	77·2	73·8
Jeypore	28·535	28·437	·098	28·480	+ ·021	·881	91·8	65·4	26·3	96·3	54·2	42·1	84·0	89·1	76·9	+ 1·0	59·9	67·7	68·4	65·3
Ajmere	·356	·252	·104	·300	+ ·007	·875	94·2	65·3	28·9	98·0	54·2	43·8	85·9	92·2	79·1	+ 4·2	60·9	68·5	70·2	66·5
Mount Abu	26·161	26·083	·079	26·116	+ ·023	?	78·8	64·5	14·3	81·7	59·4	22·3	74·6	77·0	71·6	+ 0·7	54·8	58·3	59·3	57·5
Chakrata	23·340	23·290	·049	23·306	+ ·001	?	63·8	48·2	15·6	66·3	42·6	23·7	58·9	58·9	54·6	− 2·3	44·5	51·8	53·4	49·9
Ranikhet	24·187	24·125	·062	24·141	+ ·026	?	66·2	51·9	14·3	69·3	45·5	23·8	61·7	63·6	58·2	− 2·8	47·6	54·0	55·9	52·5
Pithoragarh	·838	·773	·065	·790	+ ·052	?	71·5	53·0	18·6	75·0	46·9	28·1	63·6	69·4	61·5	− 2·6	50·8	58·4	59·5	56·3
Dehra	27·741	27·662	·080	27·690	+ ·047	·915	79·5	59·4	20·1	81·6	53·8	27·8	72·4	74·2	67·7	− 3·2	57·3	64·5	65·5	62·4
Roorkee	29·076	28·976	·101	29·015	+ ·053	·886	85·3	62·8	22·5	88·6	54·9	33·7	76·7	82·0	72·8	− 1·5	60·7	68·1	70·8	66·3
Meerut	·224	29·130	·094	·170	+ ·053	·886	85·7	63·5	22·2	88·7	55·0	33·7	77·2	83·3	73·6	− 2·2	63·0	68·6	70·3	67·3
Agra	·426	·323	·103	·364	+ ·050	·886	88·4	67·2	21·2	92·5	59·2	33·3	82·3	87·1	77·2	− 0·6	64·5	71·2	72·7	69·4
Lucknow	·593	·487	·106	·534	+ ·034	·867	87·2	66·3	20·9	91·8	56·5	35·3	81·3	85·2	76·2	− 1·6	65·0	72·7	73·6	70·5
Allahabad	·659	·542	·117	·595	+ ·037	·860	88·6	67·0	21·5	92·0	55·6	36·4	82·4	87·3	76·9	− 1·9	66·1	73·6	72·8	70·8
Ghazipur	·754	·633	·121	·689	+ ·055	·860	90·0	69·8	20·2	92·6	60·0	32·6	83·8	86·0	78·5	+ 0·3	67·2	73·7	72·1	71·0
Nowgong	·205	·103	·102	·149	+ ·041	·873	86·2	65·5	20·7	90·0	55·3	34·7	79·6	83·9	75·1	− 2·0	64·2	70·1	70·9	68·4
Sutna	28·922	28·817	·105	28·865	+ ·042	·880	85·1	65·3	19·8	89·1	55·7	33·4	80·4	83·6	74·3	− 1·3	64·1	70·0	69·1	67·8
Darbhanga	29·818	29·692	·127	29·751	+ ·045	·873	88·0	69·6	18·4	92·0	63·5	28·5	83·0	86·3	78·6	− 0·8	68·2	73·5	73·2	71·6
Patna	·785	·668	·117	·723	+ ·039	·860	88·7	70·6	18·1	92·8	63·8	29·0	84·0	86·1	78·7	− 0·6	67·8	72·9	72·0	70·9
Hazaribagh	27·961	27·864	·098	27·915	+ ·048	·882	84·2	66·0	18·2	86·9	60·8	26·1	79·0	81·6	74·1	+ 0·8	61·8	66·9	67·2	65·3
Darjeeling	23·075	23·005	·069	23·039	+ ·010	?	59·7	48·3	11·6	64·1	42·9	21·2	55·9	57·2	53·2	− 1·2	44·9	52·4	53·5	50·1
Pedong	25·381	25·276	·105	25·328	+ ·005	?	70·0	55·7	14·3	76·0	48·2	27·8	65·2	66·6	62·0	− 1·2	53·9	61·2	61·5	58·8
Berhampore	29·904	29·777	·126	29·835	+ ·042	·851	88·1	73·3	14·9	91·1	68·2	22·9	83·0	86·5	80·2	− 0·5	70·4	74·7	74·5	73·2
Burdwan	·885	·755	·130	·815	+ ·050	·862	89·8	73·2	16·6	91·9	67·4	24·5	83·3	86·8	80·7	− 0·7	70·5	73·2	73·0	72·3
Calcutta (Alipore)	·951	·831	·120	·886	+ ·051	·853	87·3	73·1	14·1	90·2	67·7	22·5	83·3	85·8	80·0	0	71·7	74·3	74·4	73·5
Calcutta (Chowringhee)	·958	?	?	?	?	?	89·3	73·5	15·7	92·5	68·7	23·8	85·2	?	81·4	?	72·5	75·8	?	?
Saugor Island	·946	·830	·116	·883	+ ·056	·853	87·8	75·9	11·9	91·3	70·0	21·3	84·5	85·6	80·8	+ 0·8	72·8	76·8	76·5	75·3
Dacca	·945	·825	·120	·883	+ ·044	·853	88·5	72·7	15·8	91·9	67·0	24·9	83·8	86·0	80·3	− 0·1	70·3	75·2	75·0	73·5
Chittagong	·879	·764	·115	·822	+ ·036	·857	87·2	71·3	16·0	90·2	65·6	24·6	82·6	83·5	78·3	− 0·8	70·4	76·9	76·7	74·7
Demagiri	Not recorded.						85·5	72·7	12·8	88·9	66·6	22·3	81·7	84·9	79·0	+ 0·5	?	?	?	?
Tura	Ditto.						83·9	68·4	15·4	88·8	62·5	26·3	78·6	80·9	75·4	+ 0·9	?	70·9	72·3	?
Dhubri	·862	·724	·138	·789	+ ·021	·860	84·4	70·4	14·0	88·9	65·8	23·1	77·8	83·2	76·5	− 1·6	68·6	72·2	74·0	71·6
Sibsagar	·632	·475	·157	·554	− ·013	·846	84·2	68·3	15·9	88·4	62·6	25·8	75·9	82·7	75·1	− 1·1	68·0	72·7	75·2	72·0
Silchar	·864	·733	·131	·804	+ ·029	·859	89·2	71·0	18·2	93·2	65·3	27·9	81·8	86·9	79·0	− 0·1	70·1	76·2	77·3	74·5

II.

in India, Burma, &c., in October 1891.

Vapour Tension.					Humidity.					Cloud.				Wind Direction.											Wind Steadiness.		Wind Velocity.		Station.
														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.	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.	
·219	·257	·265	·247	+ ·014	64	53	52	56	+ 11	3·7	4·7	4·2	+ 2·1	20	1	1	6	23	6	1	1	3	S. 45° E.	S. 30° E.	43	10	179	143	Murree.
·348	·366	·459	·391	+ ·053	84	58	61	68	+ 14	2·2	4·0	3·1	+ 1·3	33	4	...	...	2	1	2	6	14	N. 57° W.	N. 11° E.	31	7	80	106	Chamba.
·138	·158	·150	·149	+ ·025	82	49	43	58	+ 11	2·5	5·3	3·9	+ 0·4	...	1	...	...	...	19	20	17	5	S. 51° W.	S. 49° W.	72	68	38	35	Kailang.
·203	·244	·276	·237	− ·021	60	58	62	59	+ 7	2·4	3·3	2·7	+ 1·3	12	17	9	1	1	4	1	3	2	N. 9° E.	N. 87° W.	41	35	?	?	Simla.
·375	·446	·421	·414	+ ·044	75	48	39	54	+ 7	1·5	3·8	2·6	+ 1·2	14	7	10	16	3	2	4	3	3	N. 62° E.	N. 61° E.	31	37	61	60	Peshawar.
·471	·498	·459	·476	+ ·023	84	47	36	56	+ 9	1·0	1·0	1·0	+ 0·3	14	8	3	11	8	6	1	4	7	N. 74° E	N. 3° W.	15	12	55	38	Lahore.
·510	·537	·470	·506	+ ·031	89	54	39	61	+ 7	2·0	2·5	2·2	+ 1·3	33	6	1	1	4	3	...	8	6	N. 57° W.	N. 40° W.	14	24	32	24	Ludhiana.
·446	·566	·696	·569	+ ·045	67	55	44	55	+ 1	0·7	0·9	0·8	+ 0·5	13	...	19	...	16	...	13	...	1	S 67° E.	S. 70° W	26	21	25	46	Mooltan.
·383	·405	·356	·406	− ·039	61	30	21	38	− 6	0·4	0·8	0·6	+ 0·2	43	1	2	3	5	3	1	1	3	S. 56° E.	S. 47° E.	8	11	52	51	Jacobabad.
·507	·370	·344	·407	− ·077	64	26	21	37	− 7	1·1	1·4	1·2	+ 0·8	...	1	16	...	2	2	39	1	1	S. 43° W.	S. 61° W	39	42	197	188	Hyderabad.
·659	·746	·802	·742	+ ·106	82	60	63	70	+ 8	0·2	0·1	0·2	− 0·7	...	1	4	5	1	...	17	27	7	S. 84° W.	S. 67° W.	58	64	231	233	Kurrachee.
·460	·487	·443	·463	+ ·040	73	41	32	49	+ 4	0·7	2·5	1·6	− 0·2	6	9	12	6	2	1	6	7	13	N. 12° W.	N. 1° W.	33	38	61	87	Jeypore.
·477	·433	·469	·476	+ ·013	72	39	31	48	− 2	0·6	1·8	1·2	+ 0·2	1	5	3	1	4	3	9	22	14	N. 82° W.	N. 76° W.	53	23	100	61	Ajmere.
·311	·304	·304	·313	− ·030	50	36	33	41	− 4	1·1	1·2	1·1	− 1·1	2	12	7	2	3	1	9	14	12	N. 51° W	N. 14° E.	40	6	122	96	Mount Abu.
·258	·315	·356	·310	+ ·033	76	63	71	70	+ 12	2·4	4·0	3·2	+ 1·5	2	...	4	9	1	3	15	28	...	S. 66° W.	S. 64° W.	47	30	107	120	Chakrata.
·289	·339	·371	·333	+ ·006	74	62	64	66	+ 6	2·7	4·2	3·5	+ 1·9	22	...	...	5	1	4	23	7	...	S. 40° W.	S. 54° W.	43	55	40	42	Ranikhet.
·354	·440	·410	·401	+ ·022	87	74	57	72	+ 9	2·9	3·0	3·0	+ 0·9	27	...	4	3	...	3	23	2	...	S. 37 W.	S. 15° E.	32	36	59	58	Pithoragarh.
·448	·510	·523	·494	?	87	64	62	71	?	2·3	3·2	2·7	+ 1·6	6	9	3	7	8	11	6	5	6	S. 15° E.	N. 38° W.	10	19	36	40	Dehra.
·510	·577	·576	·555	+ ·063	89	63	53	68	+ 9	1·4	1·6	1·5	+ 0·7	37	...	3	0	9	1	1	...	10	N. 31° E.	S. 27° E.	2	11	23	34	Roorkee.
·578	·587	·572	·579	+ ·082	97	62	50	70	+ 13	1·5	1·2	1·4	+ 0·7	34	...	1	6	6	...	...	9	6	N. 67° W.	N. 48° W	4	40	23	34	Meerut.
·577	·620	·615	·604	+ ·115	86	56	48	63	+ 14	1·0	0·5	0·7	− 0·2	...	5	9	1	10	3	10	2	22	N. 46° W.	N. 78° W.	23	40	75	71	Agra.
·608	·694	·678	·660	+ ·088	93	65	56	71	+ 10	1·2	1·6	1·4	− 0·2	2	5	3	2	3	3	7	16	21	N. 68° W.	N. 30° W.	52	39	48	47	Lucknow.
·637	·715	·623	·658	+ ·027	95	65	48	69	+ 1	2·1	1·7	1·9	+ 0·1	11	6	3	2	4	5	3	9	19	N. 57° W.	N. 42° W.	34	13	43	41	Allahabad.
·639	·703	·609	·650	+ ·022	87	61	49	66	+ 7	1·7	2·3	2·0	− 0·2	18	3	1	5	7	7	3	11	5	S. 42° W.	S. 71° W.	15	23	27	34	Ghazipur
·591	·616	·586	·598	+ ·062	93	61	51	68	+ 11	1·8	2·2	2·0	− 0·8	3	6	2	8	...	...	3	35	5	N. 74° W.	N. 42° W.	52	35	43	35	Nowong
·591	·607	·537	·578	+ ·064	93	59	47	66	+ 9	1·8	1·7	1·8	− 0·5	6	25	4	1	1	1	...	12	12	N. 25° W	N. 34° W.	61	47	91	108	Sutna.
·677	·704	·647	·676	− ·090	93	62	51	69	− 7	1·1	1·2	1·1	− 1·8	11	4	4	6	6	3	4	11	13	N. 59° W.	N. 68° E.	19	3	39	53	Darbhanga.
·650	·663	·602	·638	− ·061	86	57	48	64	− 6	1·9	2·5	2·2	− 1·3	5	3	4	8	3	9	2	15	13	N. 79° W.	N. 21° E.	21	4	52	45	Patna.
·511	·514	·492	·506	− ·039	78	51	46	58	− 7	3·4	5·0	4·2	− 0·1	4	19	1	5	1	3	4	9	16	N. 34° W.	N. 42° W.	48	34	128	49	Hazaribagh.
·268	·362	·374	·332	− ·038	78	80	80	79	− 3	4·6	5·0	4·9	− 0·6	20	...	10	2	1	...	15	11	2	S. 77° W.	S. 3° E.	23	5	105	62	Darjeeling.
·400	·497	·492	·462	− ·050	88	79	75	81	− 5	3·1	2·8	3·0	− 2·5	...	...	10	13	12	10	5	4	1	S. 55° E.	?	46	?	?	?	Pedong.
·716	·754	·694	·721	− ·071	86	67	55	69	− 10	2·6	2·4	2·5	− 2·2	2	14	1	3	1	5	6	19	11	N. 65° W.	N 12° W	47	16	47	51	Berhampore.
·727	·688	·632	·684	− ·111	90	60	49	67	− 8	2·5	3·4	3·0	− 1·2	6	24	13	1	1	4	5	4	4	N. 1° E.	N. 19° E.	45	29	41	47	Burdwan.
·762	·737	·704	·734	− ·108	93	64	57	71	− 12	2·1	3·1	2·6	− 1·6	...	15	7	4	2	1	11	11	11	N. W.	N. 48° W.	39	11	69	71	Calcutta (Alipore).
·790	·771	?	?	?	95	64	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	Calcutta (Chowringhee).
·773	·882	·789	·795	− ·067	86	69	64	73	− 9	3·7	4·0	3·8	− 0·7	...	18	9	1	1	4	9	6	14	N. 32° W.	N. 10° E.		13	199	156	Saugor Island.
·714	·761	·725	·734	− ·120	88	66	56	71	− 9	2·9	3·1	3·0	− 1·1	...	10	6	3	6	12	8	7	10	S. 86° W.	S. 55° E.	13	4	78	57	Dacca.
·738	·851	·831	·807	− ·048	96	76	72	82	− 1	4·2	4·2	4·2	− 0·1	18	5	12	5	3	2	4	6	7	N. 10° E.	N. 10° W.	19	14	31	71	Chittagong.
?	?	?	?	?	?	?	?	?	?	1·0	1·5	1·2	− 0·8	6	...	...	1	24	13	18	...	...	S. 7° E.	N. 54° W.	69	15	?	?	Demagiri.
?	·673	·703	?	?	?	69	66	?	?	2·9	2·6	2·8	− 1·3	...	3	1	17	2	15	18	5	1	S. 2° E	S. 15° E.	40	43	?	?	Tura.
·680	·719	·718	·706	− ·076	91	75	64	77	− 3	1·5	1·2	1·4	− 1·1	12	6	11	14	3	...	13	3	...	N. 78° E.	N. 47° E.	19	20	78	69	Dhubri.
·687	·766	·779	·744	− ·047	99	85	70	85	0	7·2	4·3	5·7	− 0·8	...	...	51	...	5	...	6	...	...	N. 51° E.	N. 66° E.	73	53	39	48	Sibsagar.
·237	·340	·811	·794	− ·016	95	77	64	79	− 1	4·8	3·3	4·1	− 0·6	50	1	2	3	2	...	2	1	1	N. 84° E.	S. 56° E.	5	9	6	49	Silchar.

Table

Abstract of Observations recorded at 10 A.M. and 4 P.M. at 89 Stations

Station.	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 to 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.
False Point	29·963	29·853	·110	29·906	+·061	29·869	88·3	72·5	15·8	91·5	67·8	23·7	85·5	86·1	79·4	−0·5	71·6	76·9	77·2	74·9
Cuttack	·894	·775	·118	·833	+·050	·856	90·2	73·9	16·3	93·9	69·8	24·1	85·7	87·8	81·2	+0·5	72·0	75·4	75·2	74·3
Sambalpur	·489	·371	·118	·429	+·057	·842	88·7	71·2	17·6	91·3	65·0	26·3	83·3	85·4	79·5	−0·7	68·8	75·8	74·4	72·8
Raipur	·008	28·878	·130	28·939	+·050	·854	86·6	69·0	17·7	90·9	62·7	28·2	81·9	84·4	78·1	−0·5	66·4	72·0	70·9	69·8
Khandwa	28·925	·817	·109	·867	+·042	·879	88·2	64·6	23·5	93·7	56·1	37·6	82·2	86·9	75·5	−1·2	62·6	69·6	69·4	67·2
Hoshangabad	·974	·852	·122	·910	+·050	·899	87·4	66·2	21·2	90·8	60·3	30·5	80·0	86·1	75·9	−1·1	64·3	70·9	71·8	69·0
Saugor	·206	·105	·101	·152	+·030	·879	86·7	64·5	22·2	90·5	56·2	34·3	80·5	84·0	74·3	−0·9	61·8	69·6	69·9	67·1
Jubbulpore	·647	·539	·108	·590	+·061	·889	85·4	64·1	21·3	90·7	54·6	36·1	79·0	83·2	73·6	−0·3	63·2	70·0	69·3	67·5
Pachmarhi	26·566	26·487	·079	26·523	+·047	?	77·1	?	?	80·7	68·0	?	73·8	74·0	?	?	62·2	62·4	62·6	62·4
Seoni	27·949	27·844	·105	27·892	+·046	?	85·7	61·3	24·4	89·2	56·0	33·2	Imperfect.		?	?	60·6	69·4	71·7	67·3
Nagpur	28·944	28·818	·126	28·877	+·057	·863	88·0	67·3	20·6	92·3	63·0	29·3	82·0	86·0	78·0	−0·7	63·4	70·4	69·5	67·8
Chanda	29·351	29·226	·124	29·285	+·058	·872	88·3	66·6	21·7	91·4	60·6	30·8	81·9	86·1	77·7	−0·8	65·1	72·1	73·0	70·1
Sironcha	·569	·447	·122	·504	+·030	·852	89·7	71·1	18·6	91·7	64·8	26·9	81·9	87·0	80·6	−0·3	69·2	75·1	75·1	73·1
Chikalda	26·433	26·336	·097	26·380	+·041	?	77·0	63·3	13·7	80·3	60·1	20·2	73·1	74·4	69·5	−0·3	57·1	62·7	63·7	61·1
Buldana	27·851	27·742	·108	27·792	+·036	·868	84·5	66·3	18·1	89·3	62·0	27·3	80·2	82·2	75·6	−0·9	60·5	66·9	66·3	64·6
Akola	29·056	28·922	·134	28·985	+·049	·875	89·6	63·4	26·2	93·9	58·0	35·9	82·6	88·1	77·3	−0·7	62·4	70·7	70·0	67·7
Makhla	Not recorded.						80·4	64·2	16·2	84·7	60·0	24·7	73·9	74·9	71·7	−0·4	59·9	65·9	66·3	64·0
Deesa	·495	29·384	·111	29·433	+·016	·851	99·6	68·6	30·9	103·6	60·0	43·6	90·4	97·4	83·7	+3·2	62·1	69·1	69·6	67·0
Bombay	·933	·814	·119	·870	+·029	·847	88·1	76·4	12·4	91·9	73·2	18·7	83·2	85·5	81·7	+0·6	72·7	76·0	77·1	75·3
Poona	28·137	28·007	·130	28·076	+·032	·862	90·0	64·0	26·0	94·2	57·9	36·3	82·8	87·1	76·2	+0·4	61·1	67·4	67·5	65·4
Sholapur	·383	·239	·144	·314	+·035	·850	90·6	67·2	25·4	95·7	59·6	36·1	83·9	88·2	77·7	+0·8	63·6	71·5	70·5	68·4
Ratnagiri	29·830	29·726	·105	29·774	+·020	·821	91·1	71·1	19·9	94·6	68·2	26·4	87·9	86·1	79·7	−0·1	67·8	76·0	78·0	73·9
Karwar	·899	·785	·114	·838	+·008	·814	87·5	71·3	16·2	91·3	67·3	24·0	81·3	83·4	78·5	+0·3	71·2	75·0	76·8	74·3
Belgaum	27·431	27·310	·121	27·369	+·014	·817	83·4	65·3	18·0	87·2	59·8	27·4	77·6	79·5	72·9	+0·7	63·3	68·4	68·6	66·8
Secunderabad	28·177	28·057	·120	28·120	+·045	·851	89·2	68·1	21·1	92·3	62·0	30·3	83·1	85·1	77·0	+0·5	66·1	73·7	73·4	71·1
Vizagapatam	29·946	29·824	·122	29·880	+·062	·849	85·8	78·7	7·1	87·0	75·0	12·0	84·9	85·9	84·3	+1·0	72·2	75·6	76·7	74·8
Bellary	28·474	28·333	·141	28·407	+·046	·820	92·5	70·9	21·6	96·2	65·6	30·6	83·8	88·0	80·0	+1·3	66·5	71·7	71·5	69·9
Madras*	29·841	29·895	·112	29·832	+·043	·835	88·2	75·5	12·7	94·2	72·8	21·4	86·1	80·5	80·9	−0·2	?	78·7	77·0	77·1
Salem	29·023	28·885	·138	28·960	+·017	·839	90·4	72·2	18·2	91·4	67·9	26·5	83·0	84·3	78·8	+1·0	70·6	75·5	76·4	74·2
Mercara	26·252	26·152	·100	26·202	−·045	·849	76·9	63·0	13·9	81·6	57·5	24·1	69·5	71·9	68·1	+0·6	61·3	65·7	66·2	64·4
Trichinopoly	29·683	29·548	·135	29·622	+·021	·810	88·0	74·5	13·5	96·1	66·3	29·8	81·4	84·1	79·2	−1·1	72·9	75·9	76·7	75·2
Cochin	·932	·824	·108	·874	−·014	·812	87·1	75·0	12·1	90·1	72·6	17·5	88·2	83·5	80·1	+0·5	73·9	77·4	77·3	76·2
Wellington	24·292	24·211	·081	24·252	+·037	?	68·7	55·4	13·3	71·2	52·0	19·2	64·7	63·1	61·1	+0·3	54·5	60·4	60·1	58·3
Akyab	29·943	29·823	·120	29·884	+·032	·847	88·5	77·9	10·6	93·2	74·3	18·9	83·7	84·7	82·3	+0·9	72·6	79·0	78·5	76·7
Diamond Island	·923	·802	·121	·861	+·017	·837	88·4	73·0	15·4	92·0	70·5	21·5	84·4	84·3	79·5	−0·4	72·3	78·3	77·4	76·0
Rangoon	·918	·782	·136	·856	+·009	·834	?	74·6	?	?	70·9	?	82·7	84·7	?	?	73·5	78·3	78·2	76·6
Mergui	·856	·734	·122	·793	+·003	·821	88·3	68·5	20·5	90·6	67·0	23·6	83·6	83·7	77·4	−1·1	67·1	78·5	78·5	74·7
Cocos Island	·844	·742	·102	·791	?	?	86·9	?	?	89·0	?	?	85·1	82·9	?	?	74·8	79·7	77·9	77·5
Port Blair	·884	·771	·113	·826	+·019	·818	89·2	77·9	11·3	91·2	75·8	15·4	85·0	85·4	82·1	+2·0	75·5	81·1	80·6	79·1
Quetta	24·764	24·693	·072	24·720	+·043	?	74·0	41·0	33·0	83·3	32·0	51·3	66·2	70·4	56·6	+0·6	37·7	49·8	50·7	46·0
Srinagar	25·028	24·963	·065	24·995	?	?	62·1	41·8	20·3	79·8	34·1	45·7	53·2	60·4	52·1	?	41·6	49·3	53·3	48·1
Leh	19·797	19·700	·097	19·758	+·024	?	57·2	29·5	27·8	70·2	19·8	50·4	46·3	52·4	43·2	+1·2	25·5	34·7	37·0	32·4
Katmandu	25·719	25·631	·088	25·674	+·021	?	84·6	51·8	32·5	89·2	41·6	47·6	67·6	72·8	65·2	−2·4	50·9	62·0	63·3	58·8
Minicoy	29·952	29·853	·099	29·901	?	·836	84·4	77·9	6·5	89·1	74·4	14·7	81·8	81·2	80·2	?	74·4	77·1	76·6	76·0
Aden	·875	·749	·126	·812	−·020	·838	89·6	78·7	10·8	96·7	73·3	23·4	85·9	86·8	83·5	+0·8	72·4	75·5	75·1	74·3
Zanzibar	·997	·895	·102	·946	?	·945	83·2	74·9	8·3	86·2	72·3	13·9	78·9	82·6	78·9	?	72·2	74·8	74·2	73·7

* The hours of observations are 14 hours and 20 hours (in case of winds from the hourly means of anemograph at 12 hours and 24 hours

II—*concluded.*

in India, Burma, &c., in October 1891—concluded.

Vapour tension.					Humidity.					Cloud.				Wind Direction.											Wind Steadiness.		Wind Velocity.		Station.
														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.	
·766	·814	·776	·785	−·043	95	66	62	75	− 5	3·7	3·8	3·7	−1·0	...	13	7	13	3	7	6	5	8	N. 28° E.	N. 40° E.	19	25	145	149	False Point.
·765	·747	·708	·742	−·044	90	61	54	68	− 7	2·4	3·8	3·1	−1·3	2	10	17	9	1	3	10	5	4	N. 26° E	N. 32° E.	26	25	41	44	Cuttack.
·681	·771	·706	·719	−·051	89	68	58	72	− 2	1·4	2·5	2·0	−1·2	...	12	18	6	2	2	8	4	10	N. 8° E.	N. 7° E.	37	29	86	49	Sambalpur.
·621	·659	·582	·620	−·025	87	60	50	66	− 1	3·1	4·5	3·8	+0·3	10	12	19	3	2	...	4	6	6	N. 11° E.	N. 28° E.	42	37	122	95	Raipur.
·552	·571	·503	·542	−·005	89	52	40	60	+ 2	1·3	1·9	1·6	−0·8	2	14	16	6	6	1	2	5	10	N. 17° E.	N. 24° .	43	28	50	69	Khandwa.
·586	·645	·608	·613	+·014	90	63	50	67	+ 4	1·7	2·0	1·8	−0·7	4	7	8	3	1	22	4	8	5	S. 29 W.	N. 12° E.	18	25	62	38	Hoshangabad.
·527	·586	·563	·559	+·052	86	56	49	64	+ 7	1·0	2·7	1·8	+0·1	...	6	2	4	3	6	21	11	9	S. 70° W.	N. 28° W.	42	45	41	64	Saugor.
·577	·634	·551	·587	+·019	95	63	49	69	+ 4	2·2	2·6	2·4	−0·4	9	11	14	1	6	6	6	6	3	N. 19° E.	N. 3° E.	14	17	29	50	Jubbulpore.
·440	·435	·442	·439	−·009	54	53	53	54	− 9	2·2	3·0	2·6	−0·6	28	1	9	4	1	1	6	6	6	N. 31° W.	N. 17° E.	11	37	54	70	Pachmarhi.
·494	?	?	?	?	87	?	?	?	?	2·1	2·8	2·4	−1·5	...	4	22	13	3	4	5	6	5	N. 53° E.	N. 28° E.	35	49	29	73	Seoni.
·543	·605	·521	·556	−·028	80	56	42	59	− 2	2·2	2·8	2·5	−1·5	13	9	24	1	...	7	3	5	...	N. 33° E.	N. 37° E.	32	51	97	89	Nagpur.
·607	·661	·640	·636	−·054	93	61	51	68	− 3	1·4	2·6	2·0	−1·8	18	8	13	5	7	1	1	5	4	N. 39° E.	N. 48 E.	27	32	54	55	Chanda.
·694	·782	·714	·730	+·003	91	72	56	73	+ 1	3·3	4·4	3·8	0	32	12	3	2	...	2	...	1	10	N. 12° W.	N. 9° E.	32	32	32	64	Sironcha.
·399	·452	·470	·447	−·028	69	56	56	62	− 2	2·6	3·8	3·2	−0·4	30	14	2	1	2	1	1	2	9	N. 15° W.	N. 3° E.	31	45	129	134	Chikalda.
·459	·498	·450	·474	−·072	70	49	42	54	− 7	1·9	2·0	2·0	−2·2	3	5	21	17	4	4	1	...	7	N. 59° E.	N. 29° E.	55	52	118	121	Buldana.
·546	·598	·492	·554	−·024	90	54	38	59	− 2	2·8	4·0	3·4	+0·4	5	6	26	7	3	1	1	6	7	N. 32° E.	N. 20° E.	48	32	92	81	Akola.
?	?	?	?	?	?	?	?	?	?	3·4	4·4	3·9	−0·9	...	8	5	1	1	1	4	14	28	N. 50° W.	N. 67° W.	67	30	?	?	Makhla.
·474	·429	·352	·440	−·004	66	31	20	38	− 4	1·2	2·4	1·8	−0·1	...	6	5	5	8	6	10	14	8	S. 74° W.	N. 62° W.	21	16	177	161	Deesa.
·758	·804	·818	·793	−·050	83	71	67	74	− 6	2·1	2·2	2·2	−2·0	...	3	12	18	1	...	...	8	20	N. 12° E.	N. 15° E.	40	38	230	232	Bombay.
·509	·485	·436	·496	−·059	84	44	35	55	− 4	3·4	5·0	4·2	−0·8	8	...	11	27	8	...	...	4	4	N. 82° E.	N. 38° E.	55	17	161	139	Poona.
·554	·620	·534	·584	+·009	83	54	40	61	0	4·6	6·2	5·4	−0·7	...	8	16	22	12	1	1	1	1	N. 76° E.	N. 50° E.	65	30	183	185	Sholapur.
·640	·741	·852	·762	−·030	83	56	68	75	− 1	1·2	2·2	1·7	−1·5	...	17	2	7	5	13	1	4	13	N. 12° W.	S. 81° W.	18	17	171	173	Ratnagiri.
·755	·786	·835	·795	−·022	96	74	73	82	− 2	3·2	4·6	3·9	−0·6	7	5	10	...	...	...	...	19	21	N. 45° W.	N. 82° W.	61	56	39	?	Karwar.
·562	·584	·567	·584	−·004	89	62	58	72	0	5·6	6·5	6·0	+0·4	...	6	21	21	7	3	3	...	1	N. 73° E.	N. 88° E.	64	72	248	251	Belgaum.
·622	·716	·678	·672	+·072	90	63	57	70	+ 4	4·0	4·2	4·1	−0·2	2	1	24	25	6	1	...	...	3	N. 72° E.	N. 37° E.	74	42	105	96	Secunderabad.
·700	·768	·803	·757	−·058	71	64	64	66	− 6	3·9	3·9	3·9	−0·7	...	15	10	13	...	7	7	7	3	N. 27° E.	S. 65° E.	23	18	56	44	Vizagapatam.
·602	·630	·568	·600	−·028	79	55	44	59	− 5	6·4	6·8	6·6	+0·2	30	...	...	25	7	...	...	...	...	S. 81° E.	N. 24° E.	48	14	111	103	Bellary.
?	·886	·882	·881	+·064	?	72	85	83	+ 4	6·3	4·8	5·9	−0·2	...	20	14	15	8	4	...	...	1	N. 55° E.	N. 35° E.	58	10	128	122	Madras.*
·730	·782	·807	·773	+·020	92	70	69	77	0	5·7	7·6	6·7	+1·1	...	1	28	21	1	5	5	...	1	N. 72° E.	S. 52° W.	63	39	57	64	Salem.
·525	·591	·581	·566	−·017	91	82	75	83	− 3	7·0	7·5	7·2	−0·6	...	9	17	24	...	...	...	5	7	N. 45° E.	N. 36° W.	60	24	113	85	Mercara.
·791	·822	·822	·812	+·048	92	77	71	80	+ 7	8·6	8·4	8·5	+1·0	18	2	12	9	6	1	...	7	7	N. 44° E.	N. 45° W.	23	36	85	92	Trichinopoly.
·821	·865	·857	·848	+·016	95	76	74	82	− 2	5·1	8·5	6·8	+1·0	15	...	4	...	...	...	4	19	20	N. 67° W.	S. 76° W.	58	40	85	?	Cochin.
·415	·482	·489	·462	+·019	95	80	85	86	+ 3	7·8	8·9	8·4	+1·2	2	3	5	7	28	13	2	1	1	S. 45° E.	S. 32° E.	61	27	56	57	Wellington.
·731	·931	·894	·852	−·027	76	81	75	77	− 5	3·3	2·9	3·1	−1·7	...	1	31	3	2	6	2	13	4	N. 28° E.	S. 35° E.	31	12	60	58	Akyab.
·849	·884	·849	·837	−·038	94	75	72	80	− 4	4·1	4·8	4·5	−0·8	4	9	8	10	6	2	3	7	13	N. 7° E.	S. 59° E.	26	21	86	157	Diamond Island.
·812	·912	·878	·899	+·005	95	81	74	83	− 1	4·0	5·4	4·7	−1·4	...	5	12	8	1	6	7	11	8	N 31° W.	S. 46° E.	14	27	72	76	Rangoon.
·648	·910	·907	·822	−·022	93	79	79	84	− 1	3·4	7·1	5·2	−1·9	...	15	9	6	8	1	5	2	16	N. 4° E.	S. 79° W.	37	22	52	35	Mergui.
?	·943	·891	?	?	?	78	79	?	?	4·4	4·5	4·5	?	...	11	10	8	18	3	2	1	2	N. 85° E.	?	44	?	?	?	Cocos Island.
·854	1·008	·983	·948	+·038	89	84	81	85	− 2	4·8	5·2	5·0	−0·7	6	3	9	9	21	4	2	4	4	S. 69° E.	S. 5° W.	38	24	99	149	Port Blair.
·196	·191	·169	·185	−·016	76	30	23	43	0	1·0	2·7	1·9	+1·5	53	1	...	...	...	...	...	4	4	N. 61° W.	N. 56° W.	13	50	22	66	Quetta.
·257	·310	·331	·299	?	93	76	64	78	?	3·6	3·4	3·5	?	1	6	9	6	7	5	5	7	16	N. 23° W.	?	18	?	62	?	Srinagar.
·110	·105	·091	·102	−·004	68	34	24	42	+ 1	3·5	5·7	4·6	+0·8	3	1	1	...	1	7	27	19	3	S. 59° W.	S. 56° W.	72	34	28	45	Leh.
·377	·497	·472	·446	−·031	95	73	60	76	+ 4	3·8	4·3	4·0	+0·3	4	...	...	13	4	1	...	37	3	S. 86° W.	S. 88° W.	37	59	16	?	Katmandu.
·805	·872	·853	·843	?	84	81	80	82	?	7·1	7·2	7·1	?	4	5	7	6	2	2	16	11	5	S. 84° W.	?	22	?	241	?	Minicoy.
·716	·746	·717	·726	+·006	73	60	56	63	− 1	2·9	2·4	2·6	+0·9	5	...	12	27	9	5	1	2	1	S. 85° E.	S. 88° E.	63	55	315	302	Aden.
757	·807	·735	·766		87	82	66	78	?	7·5	5·4	6·4	?	..	...	1	2	17	32	8	1	...	S. 8° E.	S. 9° W.	81	38	?	107	Zanzibar.

and the means are as given in the registers sent by Government Astronomer, Madras.

GOVERNMENT OF INDIA CENTRAL PRINTING OFFICE.—No. 111 METEO.—13-5-92.—400.

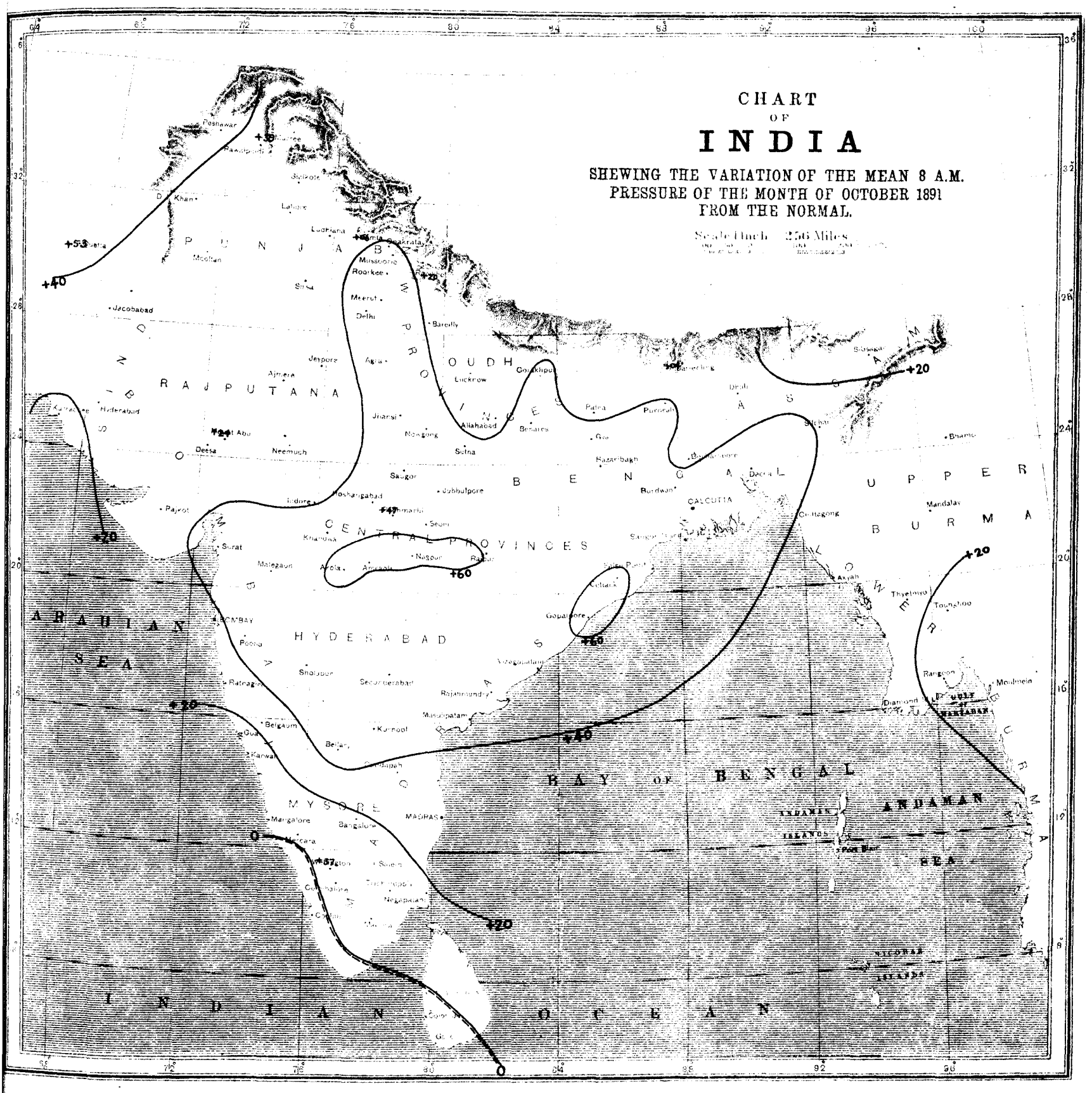
Explanation

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.

No. 103, Wr., I.—April 92—415

Photo-litho. 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.

No. 103, Wr., I.—April 92.—415.

Photo-litho. S. I. O., Calcutta

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

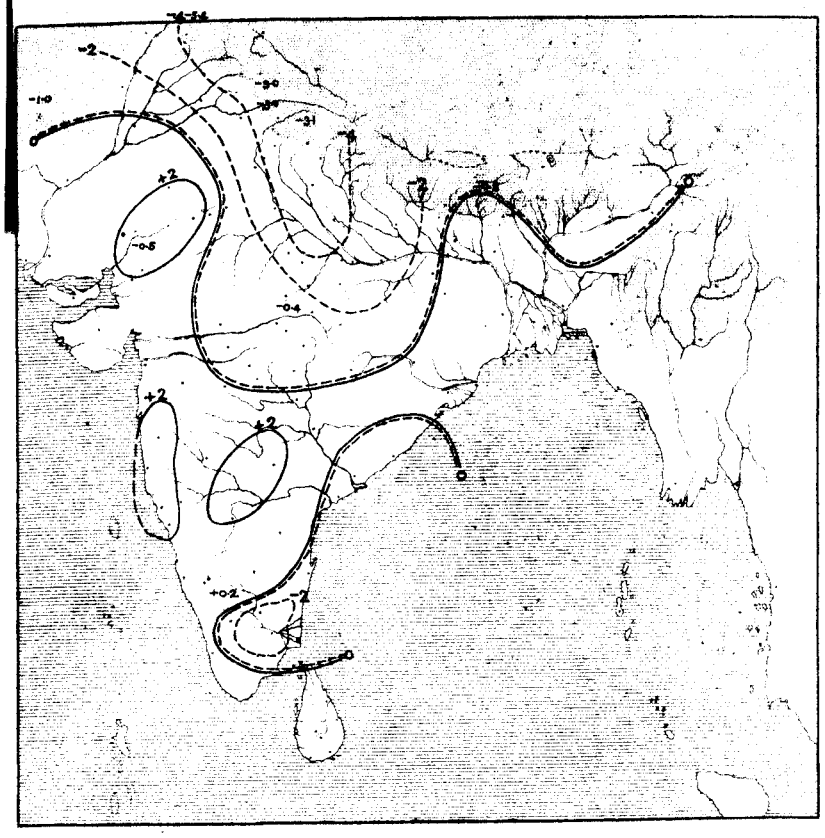
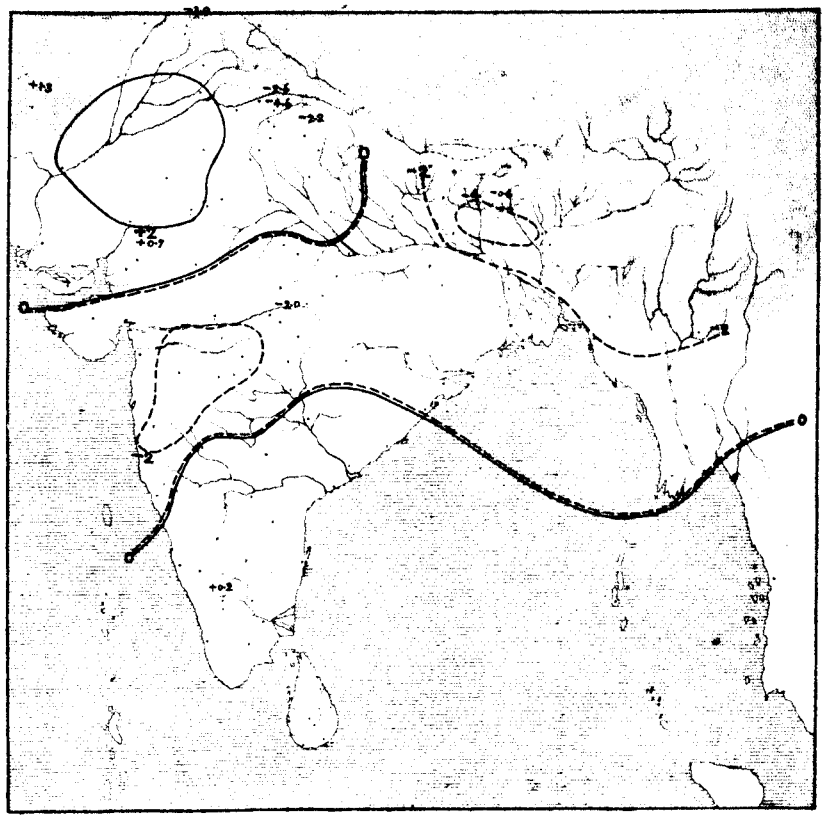


CHART SHEWING THE VARIATION OF THE MEAN MINIMUM TEMPERATURE OF THE MONTH FROM THE NORMAL.



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.

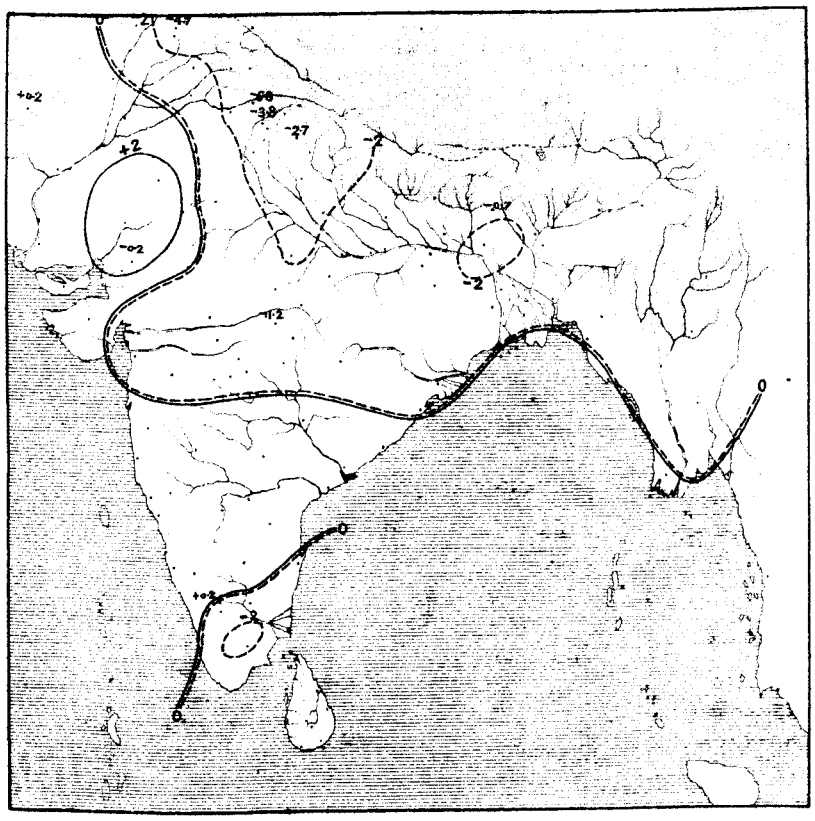
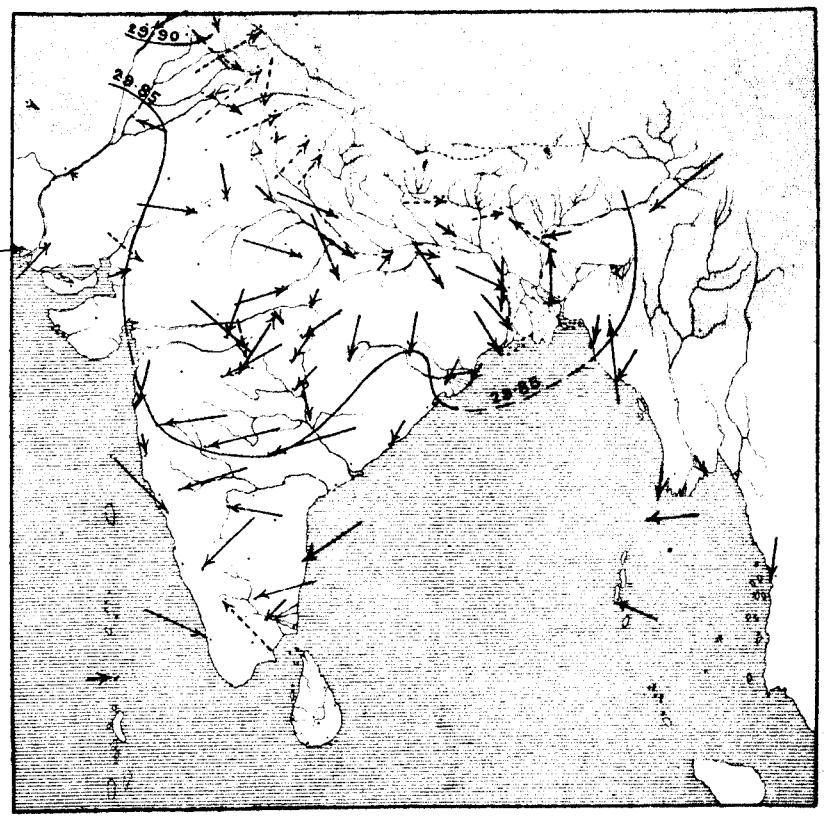


CHART SHEWING THE MEAN DISTRIBUTION OF PRESSURE AND THE RESULTANT WIND DIRECTIONS IN THE MONTH OF OCTOBER 1891.



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 ⅛th 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. 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.

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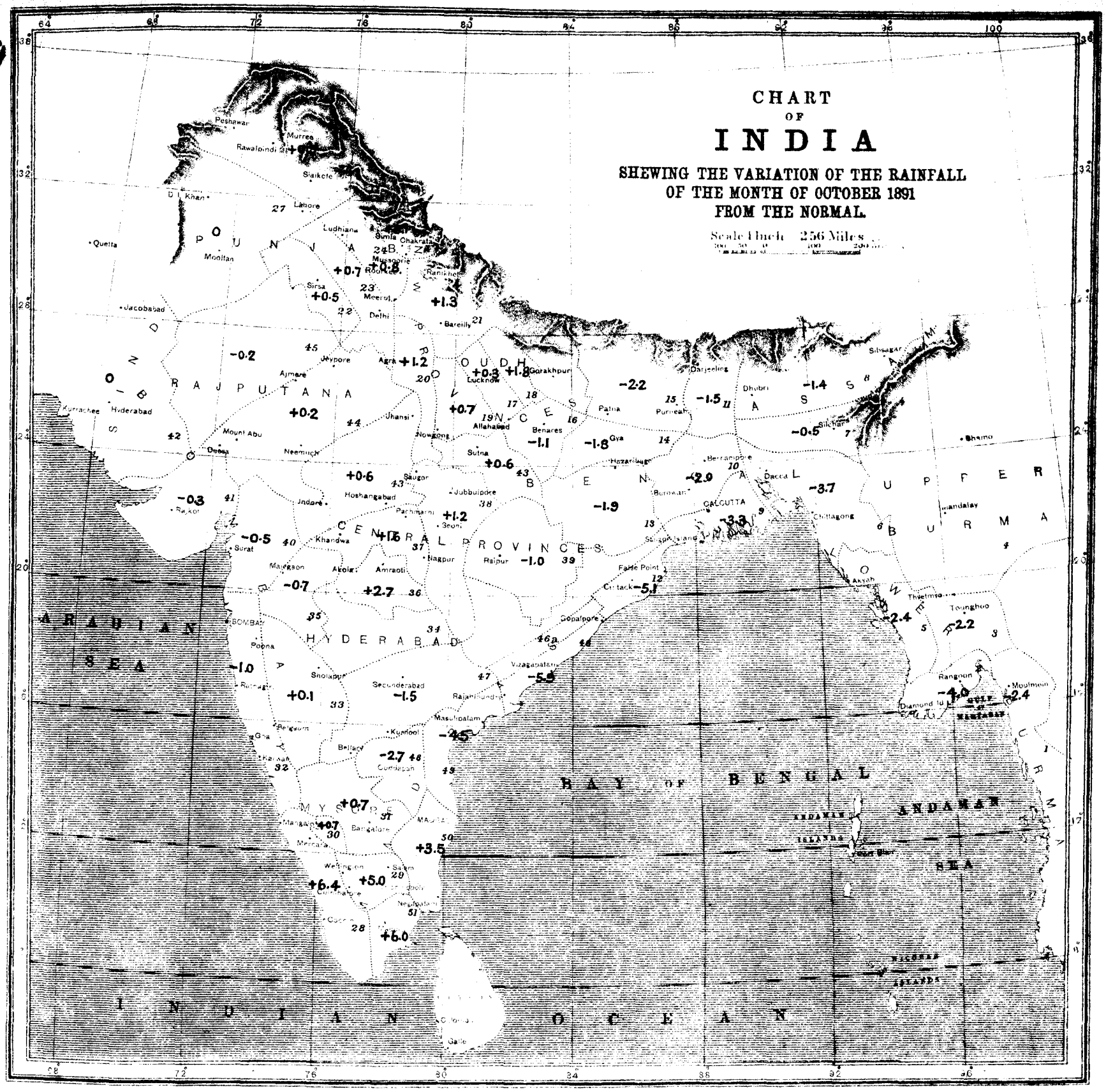
Photo-litho. S. I. O., Calcutta.



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 51 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 name of the districts 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	14 Behar (South)	27. Punjab (West)	40. Guzerat
2. Lower Burma	15. Do. (North)	28. Malabar	41. Kattiawar
3. Central do.	16. North Western Provinces (East)	29. Madras (South Central)	42 Sind
4. Upper do.	17. Oudh (South)	30. Coorg	43. Central India (East)
5. Arakan	18. Do. (North)	31. Mysore	44. Rajputana (East) Central India (West)
6. Eastern Bengal	19. North Western Provinces (Central)	32. Konkan	45. Rajputana (West))
7. Assam (Surma)	20. Do. do. (West)	33. Bombay Deccan	46. East Coast (North)
8. Do. (Brahmaputra)	21. Do. do. (Submontane)	34. Hyderabad (North)	46(a.) Do. do. (a)
9. Deltaic Bengal	22. Punjab (South)	35. Khandeish	47. Hyderabad (South)
10. Central do.	23. Do. (Central)	36. Berar	48. Madras (Central)
11. North do.	24. Do. (Submontane)	37. Central Provinces (West)	49. East Coast (Central)
12. Orissa	25. Do. (Hill Districts)	38. Do. (Central)	50. East Coast (South)
13. Chota Nagpore	26. Do. (North West)	39. Do. (East)	51. Madras (South)

GOVERNMENT OF INDIA,

METEOROLOGICAL DEPARTMENT

MONTHLY WEATHER REVIEW,

PUBLISHED BY ORDER OF

THE GOVERNMENT OF INDIA.

CALCUTTA, NOVEMBER, 1891.

INTRODUCTION.

THIS review of the weather in India during the month of November 1891 is based on observations taken at 8 A.M. daily at 161 stations, and on additional observations taken at 10 A.M. and 4 P.M. at 89 stations. The rainfall summary is based on the rainfall data of the meteorological observatories and of the rainfall telegrams received during the month from district officers throughout India, and also on the monthly provincial rainfall statements received before the preparation of the review. A brief summary of the weather in the Bay of Bengal and Arabian Sea has been drawn up from the meteorological data of the Bay of Bengal and Arabian Sea collected from vessels entering the ports of Calcutta and Bombay.

Summary of the chief features of the weather in India during the month of November 1891.

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 area.

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 29·90″ in the Punjab and 29·80″ in the centre and south of the Bay, and at the end of the month between 30·00″ in the Punjab and Central Rajputana and 29·80″ in the south of the Bay. The total range of pressure hence usually increases from an average of one to an average of two-tenths during the month.

The most important feature in the 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 blowing 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 and 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 wea-

ther 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 a large 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° 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 westward 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 Coromandel Coast districts south of Madras, West Mysore, and the Nilgherries, Palnis and other hills of Southern India.

The meteorology of the month of November 1891 was very abnormal in many respects. Weather was unusually squally with frequent heavy rain in the south of the Bay and the Arabian Sea. Three cyclonic storms visited the Indian area during the month, all of which were marked by unusual features. The first of these originated in the south-east of the Arabian Sea off the South Travancore coast and passed westward near and to the north of the island of Minicoy to which it gave excessive rain. The second storm crossed the Malay Peninsula from the Gulf of Siam and advanced by a very curved path into East Bengal and Silchar, where it broke up on the 7th. The third storm originated on the 19th and 20th in the centre of the Bay in about Lat. 12° N. and Long. 88° E., and advanced north-eastwards to the Arakan Coast near Sandoway by a curved path and broke up in Central Burma on the 24th.

The second and third storms hence marched along tracks which carried them into Bengal and Burma instead of to the Madras Coast. The indraught to these storms gave north-west dry winds to the Peninsula generally, and hence the month was one of serious deficiency of rainfall in the Deccan, Madras and Mysore.

The following gives a brief account of the three storms of the month.

Weather was very squally with strong south-westerly winds off the Travancore and West Ceylon Coasts at the end of October. North-east winds prevailed to the north of Lat. 9° or 10° N. This squally weather gave very heavy rain to the island of Minicoy and the adjacent portion of the Arabian Sea on the 1st and 2nd, and a small depression formed on the 2nd between Minicoy and the Mainland. It advanced westwards to the north of Minicoy during the night of the 2nd, and passed into a part of the Arabian Sea, which is very little frequented by shipping. Nothing further is hence known of its track. Eleven inches of rain fell during the storm at Minicoy. This flooded the lower parts of the island, and did much damage to the crops and property of the islanders. It is stated to be the most severe storm which has visited the island of Minicoy for at least twenty-five years. The island of Minicoy, it may be noted, is in Lat. 8¼° N. and it is very rarely that a cyclonic storm forms so near to the equator in the Indian seas as Lat. 8° N.

Nothing is yet known of the origin of the second storm. According to information received from Siam, it advanced west-north-westward across the Gulf of Siam on the 30th and 31st, and destroyed the towns of Bandon and Chaiya in Malayan Peninsula, which it crossed in about Lat. 10° N. on the night of the 31st October. It advanced across the Andaman Sea on the 1st of November and passed over Port Blair early on the morning of the 2nd. The S. S. *Resolute* was wrecked during the storm in Port Blair harbour. The hurricane winds caused a considerable loss of life and great destruction of houses and property in a portion of the island of Little Andaman. The storm recurved through north-west to north as it advanced across the Bay. Several ships and steamers were involved in the outer storm area during this period, but escaped from it with little injury. The cyclone area as defined by winds of force 10 and upwards, when it advanced across the Andamans, was almost certainly not more than 80 or 100 miles in diameter. Over the greater part of this storm area the winds were of hurricane force, and it is almost certain from the Port Blair observations that they blew in the most severe gusts with a velocity of at least 150 miles per hour. The lowest barometric reading at Port Blair when the calm central area was passing over it was 28·502″ (corrected 28·363 inches). The storm apparently increased considerably in extent when crossing the Bay, and the barometric depression at the centre intensified slightly. The calm centre passed over False Point at 4-30 P.M. of the 4th. Hurricane winds with most terrific squalls prevailed for some time before and after the storm centre crossed over it. The lowest reading (corrected) of the barometer at the Light-house was 28·132″ at 3-45 P.M. The calm at the Light-house lasted from 4-5 P.M. to 4-45 P.M., and is described as a 'dead calm' followed by light variable winds. The force of the wind from 5 to 6 P.M. was terrific and the

rain blinding. The storm passed over False Point at low tide, and hence the storm wave did no damage, as it did not flood the coast districts.

The storm centre passed over the F. L. V. *Canopus* at the Intermediate light station at the entrance to the Hooghly at 2-30 A.M. of the 6th and over the F. L. V. *Star* stationed at the Lower Gasper station about 3 A.M. of the 6th. The calm is stated to have lasted four or five minutes in the case of the *Canopus*, and ten or fifteen minutes in the case of the *Star*. The commanders of these vessels describe the storm as a 'terrific hurricane,' and the commander of the *Canopus* states that the terrific sea, heavy rain, thunder and lightning and force of winds were such as he had never hitherto witnessed at the Sandheads during an experience of sixteen years. The lowest barometric reading on board these vessels in the calm area was 28·81″ (corrected 28·63″) on board the *Canopus*.

The storm recurved from north-west through north and north-east during the afternoon and evening of the 5th, and was advancing in a north-east by east direction across the north-west angle of the Bay when it passed over the *Canopus* and *Star*.

The P. V. *Coleroon* which had been in almost every cyclone of the previous 27 years foundered with all hands on the night of the 5th during the storm off the Orissa Coast.

The storm crossed the Bengal Coast some distance to the east of Saugor Island probably at 8 A.M., and continued to advance in a north-east by east direction, and marched across South Bengal to the south of Jessore and Dacca. It apparently filled up very rapidly on the morning of the 6th, as, although it gave strong winds in South and East Bengal, little or no damage appears to have been done to the crops or property. The depression was in the district of Cachar on the morning of the 7th, but was very slight and of little importance, and it completely filled up during the day.

During this storm period dry north-west winds and clear weather prevailed in the Madras Coast districts. The storm gave a deluge of rain to the Orissa Coast districts and a moderate burst of rain to Burma and the whole of Bengal except Bihar and the north-west districts of North Bengal (Dinajpur and Malda.)

Southern India received moderately heavy rain during the existence of the storm of the 1st to 3rd in the Arabian Sea. This was followed by a dry period lasting until the 9th, when the weather again became slightly disturbed with frequent showers in Southern India. This lasted until the 13th when winds shifted to the north-west at the Coromandel Coast stations indicating the commencement of disturbed weather in the centre of the Bay. Dry weather and clear or lightly clouded skies obtained for several days in Southern India, whilst the third storm of the month was slowly developing in the Bay. Temperature was very considerably above the normal during the period over nearly the whole of India, the excess ranging from 1° on the Madras Coast to 9° on the North-West Frontier on the 17th and 18th. The storm developed rapidly on the 19th, and on the morning of the 20th a cyclone of smallish extent but of great intensity had formed in about Lat 12° N. and Long. 88° E., and was marching north-north-eastwards with a velocity which rapidly increased during the next 48 hours. The ship *Mobile Bay* was involved in the storm on the 22nd and 23rd, and was dismasted and left a complete wreck on deck by the storm. The storm centre advanced north-eastward about 80 or 100 miles west of Diamond Island early on the morning of the 23rd. It crossed the Arakan Coast near Sandoway on the afternoon of that day. It filled up rapidly during the evening and night of the 23rd when it was crossing the Arakan hills, and was a very shallow depression without any definite centre on the morning of the 24th. It filled up completely during the day. This storm gave a moderately heavy burst of rain to the whole of Burma, and was of great value to the crops. On the 26th fine dry clear weather obtained over the whole of India except the South Coromandal Coast which received light showers during the remainder of the month.

The mean pressure over the whole of India was almost identical with the normal. Pressure was locally slightly in defect in Burma and North-Eastern India and was in excess in the Peninsula. The excess was greatest in the West Deccan, Khandeish, Berar and Ceylon. The effect of these variations was to give considerably higher pressure in the north and centre of the Peninsula than in Burma, and to displace the mean position of the centre of the trough of low pressure in the Bay further north and east than usual. The pressure conditions in the Peninsula and the Bay were undoubtedly important factors in determining the unusual line of march of the cyclones of the month.

The mean maximum or day temperature was considerably in excess in the Deccan and Madras, and largely in excess in Upper India. The excess was more than 4° in Sind and South-West Rajputana, where it was greatest. The mean minimum or night temperature was more or less in defect in the Peninsula and North Bengal, where skies were clearer and the air drier than usual. It was considerably in excess in North-Western India. In Upper Sind and the West Punjab the excess ranged from 4° to 5½° Hence the day and night temperatures were both considerably above the average in North-Western India, and the mean temperature of the month was from 1° to 5° above the normal, the excess being greatest in Upper Sind, West Rajputana and the South-West Punjab. In the Peninsula and North-Eastern India the day and night temperatures varied in opposite directions from the normal days being on the average of the month warmer and the nights cooler than usual. Hence the mean temperature of the Peninsula, North-Eastern India and Burma varied by small amounts (generally less than 1°) from the normal.

Winds were as usual in November very light in the Punjab, North-Western Provinces, Rajputana and Central India, not averaging more than 1 to 3 miles per hour. They were normal in direction and slightly stronger and steadier than usual. Winds were considerably stronger than usual in Bengal, and the northerly winds of the month contained an abnormally strong easterly element, whilst on the Madras Coast the easterly element of the north-east winds was unusually weak. This was largely due to the prevalence of north-west winds during the two cyclonic storms of the month in the Bay.

The air was much damper in the central and western districts of the North-Western Provinces. It was drier and contained less vapour than usual in Bengal. Over the remainder of Northern India the humidity conditions differed little from those normal to the season. The air contained much less vapour than usual in Rajputana, the western states of Central India, Berar, the Central Provinces and the Deccan, and although temperature was below the normal, the air was much drier than usual. The increased dryness of the air was as marked at the Bombay Coast stations as in the Deccan.

Skies were even more serene and free from cloud than usual in North-Western and Central India, and in Bihar and the western districts of Bengal. The two cyclonic storms of the month gave increased cloud to Burma, Assam and the greater part of Bengal. Skies were abnormally free from cloud over the whole of the Peninsula to the north of Lat. 12°N. The cloud amount was normal or slightly in excess in South Madras.

The following table gives mean aqueous vapour pressure humidity and cloud amount of the ten meteorological provinces of India:—

Province.	Variation of		
	Aqueous vapour pressure from normal.	Humidity from normal.	Amount of cloud from normal.
	"	%	
Burma Coast and Bay Islands	−·021	− 1	+0·6
Assam	−·025	− 2	+0·2
Bengal and Orissa	−·003	− 2	+0·4
Gangetic Plain and Chota Nagpur	+·003	+ 1	−0·4
Upper Sub-Himalayas	+·051	+ 4	+0·1
Indus Valley and North-West Rajputana	+·042	+ 1	+0·7
East Rajputana, Central India and Guzerat	+·033	+ 1	−0·3
Deccan	−·027	− 3	−1·4
West Coast	−·049	− 5	−1·0
Southern India	−·024	−6	−0·6

The rainfall during the month was below the normal and practically *nil* over the greater part of India, including the greater part of the Punjab, Sind, Rajputana, the North-Western Provinces, North Bombay, Central India, Khandeish, Central Provinces, Bihar and a large part of North Bengal.

South and Central Madras, Malabar, Travancore, Coorg and Mysore received moderate rain during the first fortnight of the month. A large part of this rainfall was due to a depression which lay off the Malabar Coast at the commencement of the month.

The second storm of the month gave excessively heavy rain during the greater part of its existence. Orissa received an average of nearly 7 inches from it, and South Bengal and Cachar obtained moderately heavy rain. Burma, Assam and the whole of Bengal except the north-east districts of Dinajpur and Malda obtained moderate to heavy rain between the 4th and 7th.

The third week of the month was a very dry period in Southern India. During this period the third storm of the month was generated. It passed into Central Burma and gave a moderately heavy burst of rain, averaging nearly 2¼ inches, to the whole of Burma. Moderate rain also fell in Cachar during the period. South Madras received daily showers during the last six days of the month.

The rainfall of the month was very largely in excess in Orissa and moderately in excess in Burma and also in South Madras. It was considerably in defect over nearly the whole of Central and North Madras, Mysore and the South Deccan: areas which generally receive moderate rain during this month. The following table gives rainfall data of this area of partial drought during the month:—

Division.	Average actual rainfall of month.	Average normal rainfall of month.	Defect.	Percentage ratio of actual to normal rainfall.
	Inches.	Inches.	Inches.	
Madras East Coast, Central	0·70	6·52	−5·82	11
Madras East Coast, South	4·15	7·67	−3·52	54
Madras Central	0·62	1·57	−0·95	39
Madras East Coast, North	0·59	2·70	−2·11	27
Madras South, Central	2·19	3·51	−1·32	62

The deficiency was greatest in the districts of Trichinopoly, Tanjore, Coimbatore, Salem, North and South Arcot, Cuddapah, Bellary, Godavari, Kistna and Kurnool. Several of these districts received barely 11 per cent. of their normal rainfall.

The following gives comparative rainfall-data for the eleven meteorological provinces of India:—

Meteorological Province.	Rainfall.		
	Average rainfall of month.	Average normal rainfall of month.	Average variation from the normal.
	Inches.	Inches.	Inches.
Burma Coast	6·82	4·82	+1·99
Burma, Inland	2·03	1·80	+0.23
Assam	1·08	0·73	+0·36
Bengal and Orissa	2·57	0·80	+1·60
Gangetic Plain and Chota Nagpur	0·05	0·21	−0·15
Upper Sub-Himalayas	0·04	0·17	−0·13
Indus Valley and North-Western Rajputana	0·04	0·10	−0·06
East Rajputana, Central India and Guzerat	0	0·16	−0·16
Deccan	0·06	0·81	−0·73
West Coast	1·99	3·37	−1·45
Southern India	2·72	6·72	−4·48

Atmospheric Pressure.

The distribution of mean 8 A.M. pressure for November is shown by means of two charts. The first chart (Plate I) gives the distribution of the mean 8 A.M. 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 ·05″ or $\frac{1}{20}$th of an inch. The second chart Plate II) gives the variations of the actual mean pressure from the normal pressure. These values are obtained from the barometric readings reduced for temperature only. A small chart, No. 4 of Plate III, gives the distribution of the monthly mean daily pressure and of the mean winds in the same form and manner as in the monthly charts given hitherto in the annual reports on the meteorology of India. The data on which this chart is based are given in Table II.

The more important pressure changes during the month are fully given in the following statement of the barometric depressions of the month. The data that are chiefly used in this discussion are the 8 A.M. reduced observations and the variations derived from a comparison of these observations and the normal values given in Table I. The means in the third column of that table are not only reduced or corrected to sea-level but also to constant gravity. The normal means are obtained from the observations of the period 1878-88, and, in order that the means and variations may be strictly comparable, the means have been calculated for observations of the same period in all cases.

The mean pressure of the whole of India for the month agreed almost exactly with the normal, being + ·004″ in excess. Although the fluctuations of pressure were larger and more pronounced than usual in November, the mean variations of pressure of the month from the normal were generally small in amount. Pressure was slightly in relative defect or the barometric anomalies were negative in Upper India, North-Eastern India and Burma. They were less than ·02″ in amount except in two areas, for which data are given below :—

AREA.	STATION.	Anomaly (negative).
		″
South Bengal and Orissa	Saugor Island	—·029
	Balasore	—·026
	False Point	—·033
	Cuttack	—·021
South-West Punjab	Dera Ismail Khan	—·020
	Mooltan	—·025

Pressure was locally in excess in the Peninsula and Central India. The positive barometric anomalies were small except in the West Deccan, Berar and Khandeish, where they exceeded ·020.″ They were largest in the following cases :—

STATION.	Pressure anomaly (positive).
	″
Solapur	+ ·031
Khandwa	+ ·029
Malegaon	+ ·024
Poona	+ ·024

Although the pressure anomalies were not large they represented very important variations in the distribution of pressure during the month.

Barometric Depressions and Cyclonic Storms of the month.

Depression and storm in the Arabian Sea on the 2nd and 3rd November.—The information relating to the storm is very scanty and is not sufficient to enable its origin or its path to be traced.

North-easterly winds obtained on the 1st over the whole of the Arabian Sea to the north of Lat. 9° or 10° N. Off the Ceylon and Travancore Coasts weather was squally with moderate but somewhat unsteady west-south-westerly winds. The S.S. *Athens* which passed to the south of Socotra on the 23rd of October, had light north-east winds until she reached Lat. 10° N. and Long. 69° E. on the morning of the 1st. She then passed into an area of variable winds and squally weather. The following extracts from her log show the weather she experienced on the 1st :—

Hour.	Position.		Wind.	Weather.
	Lat. N.	Long. E.		
8 A.M.	9° 54′	70° 34′	Variable.	Light winds and overcast.
Noon	(course	E.S.E.)	Do.	Fresh winds and overcast.
4 P.M.	...	...	Do.	Occasional squalls.
9 P.M.	...	...	Do.	Fierce squalls and downpour of rain. Heavy thunder and lightning, slight confused sea.
9-40 P.M.	...	...	...	Thick heavy rain.
Midnight.	...	...	...	Fresh breeze and squally with incessant rain.

Her barometer was steady throughout. She continued to advance on the 2nd in the same direction and had throughout the day fresh variable winds with frequent squalls and heavy showers of rain. The S.S. *Athens* was in about Lat. 9° 20′ N. and Long. 73° 30′ E. at 9 P.M. of the 1st, at which time she experienced fierce squalls and a heavy downpour of rain. She was then about 70 miles to the north-north-east of the Island of Minicoy. Minicoy was visited by a small cyclonic depression and storm on the morning of the 2nd, which was almost certainly part of the same disturbance that gave fierce squalls to the S.S. *Athens*. The chief feature of the storm was the excessive rainfall which preceded and accompanied it. The following gives data extracted from the series of observations recorded by the observer at the tidal observatory of Minicoy during the storm:—

Date and hour.	Barometer reduced and corrected.	Rainfall in previous 24 hours.	Wind.	Sea.
	Inches.	Inches.		
1st noon . .	29·744	5·53	NE	Very rough.
2nd noon . .	·657	4·01	NE	Rough.
„ 10 P.M. .	·633	...	NNE	Slight.
„ Midnight .	·531	...	NE	Very rough.
3rd 4 A.M. .	·573	...	SSE	Slight.
„ 6 A.M. .	·645	...	SSE	Slight.
„ 8 A.M. .	·676	...	SE	Slight.
„ 10 A.M. .	·685	...	SSE	Slight.
„ Noon . .	·670	0·32	SSE	Slight.
4th Noon .	·697	1·25	S	Slight.

The barometric observations are not only reduced to 32° and constant gravity, but are also corrected for the diurnal oscillation, so that they represent the pressure changes due to the disturbance only. They indicate that a depression formed in the Arabian Sea between the Laccadives and Maldives and the Travancore Coast on the 1st, and that the central depression crossed over and near Minicoy between 10 P.M. of the 2nd and 6 A.M. of the 3rd. The barometer at midnight of the 2nd was upwards of two-tenths below the normal. The changes of wind direction indicate that the centre of the storm passed a little to the north of Minicoy between midnight and 4 A.M. of the 3rd, and most probably about 1-30 A.M. of the 3rd, as the observer notes that the wind changed its direction rapidly at 1-30 A.M. passing through the easterly point. The average velocity of the wind, as indicated by a Beckley's anemograph between 9 A.M. of the 2nd and 9 A.M. of the 3rd, was 33 miles per hour. The wind was strongest between 2 and 3 A.M. of the 3rd, when 58 miles were recorded by the anemograph.

The observer describes the storm as follows:—"A storm of rain commenced at 9 A.M. of the 1st accompanied with a fresh wind. The wind increased in force until 2 A.M. of the 3rd, when it blew a whole gale. The excessive rain on the 1st and 2nd flooded the lower parts of the island, where almost all the plantations of the islanders are situated, to the depth of three to four feet. The storm hence caused great loss to the islanders. Large number of trees were blown down and many houses unroofed. It is stated by the islanders to be the most violent storm which has visited the island during the past thirty years."

The westward advance of the storm past the island of Minicoy, carried it into a part of the Arabian Sea little frequented by shipping, and there is hence no further information available of the storm itself. A large shallow depression covered the south-east portion of the Arabian Sea until the 7th, and weather was more or less squally and showery off the Malabar Coast from the 3rd to the 6th. This depression, judging from the observations at the coast stations, finally filled up on the 8th, on which day light northerly winds (averaging 2 miles per hour) set in for a brief period at Minicoy, and north-east monsoon winds prevailed over the whole of the Arabian Sea to the north of Lat. 8°N.

Cyclone of the 30th October to the 7th November.—This is one of the most remarkable cyclones of recent years which has visited the Bay of Bengal. The following gives a brief account based on the whole of the information received up to date. A full account will be shortly prepared.

The storm originated outside the Bay of Bengal and Indian area, and passed into the Bay from the Gulf of Siam across the Malayan Peninsula. It is the first cyclonic storm of the south-west monsoon, for which there is conclusive evidence that it originated outside the Indian area. The "Siam Free Press" states that a typhoon swept across the Gulf of Siam between the 30th of October and 1st November. It passed over Koh Samine at the entrance to the Bight of Bandon and destroyed the towns of Bandon and Chaiya, the latter place being one of the largest towns in the Gulf. The whole country in the track of the storm is stated to be a complete wreck, not a house or a tree being left standing. The S. S. *Rainbow* capsized at Koh Samine, and the whole of the crew and passengers were lost with the exception of six natives. The typhoon lasted about six hours. This statement, taking into account the average rate of velocity of cyclones in the latitude of the Gulf of Siam, indicates that the inner storm area or typhoon proper was probably not more than 80 or 100 miles in diameter in the Gulf of Siam. It was hence at this stage a cyclone of small diameter but of very great intensity.

The typhoon crossed the Malayan Peninsula at the Isthmus of Kra. The forest in the Island of St. Matthew in the Andaman Sea off that part of the coast is reported by the Captain of the S. S. *Fitzpatrick*, which passed it early in November, to have been very recently partially levelled to the ground, and there is hence no doubt that the storm passed over it. It may be noted that the Isthmus of Kra lies between 10° and 11° north latitude in the Malay Peninsula, and forms a gap separating the mountains of the Peninsula from those of the Indo-Chinese Peninsula. The gap is

stated to be only about 100 feet in its highest point, and it has been proposed to cut a canal across it to shorten the route between India and Burma on the one hand and Siam and China on the other. The isthmus hence offered no obstacle to the passage of the typhoon or cyclone, which crossed it, levelling trees, houses, etc., in its path.

The cyclone probably entered the Andaman Sea early in the morning of the 1st. The ship *Marpesia* encountered the storm between 8 P.M. of the 1st and 4 A.M. of the 2nd in the Andaman Sea. The position of the ship is not given in the log on either the 1st or 2nd, and hence it is not possible to utilise her information to fix the exact position of the storm centre at this period. The following gives a summary of her information :—

Date and hour.	Barometer. (corrected).	Wind.		Weather.
		Direction.	Force.	
	Inches.			
1st, noon	29·85	NE	2	Showery.
,, 3 P.M.	29·70	NE	4	Raining, wind increasing rapidly.
,, 6 P.M.	...	NE	8	Wind increasing with constant rain and high sea.
,, 9 P.M.	29·15	NE	12	Hurricane.
,, midnight	28·85	N	12	Wind backed to north still at hurricane force.
2nd, 2 A.M.	28·95	NW	12	Constant rain.
,, 4 A.M.	29·45	W	...	Wind moderating rapidly.
,, 8 A.M.	29·65	S	6	Constant rain.

The vessel at midnight of the 1st was probably a short distance to the south of Port Blair as the cyclone centre passed over that station between 2 and 3 A.M. of the 2nd. The following gives a summary of the observations taken at that station during the storm :—

Date and hour.	Barometer reduced to 32° and sea level and to constant gravity at Latitude 45°.	Wind.		Rain.
		Direction.	Force.	
	Inches.			Inches.
1st . . 4 P.M.	29·759	ENE	Light.	...
2nd . . 1 A.M.	29·453	NE	Rising	0·40
,, . 2 A.M.	29·255	NE	Blowing very hard.	0·20
,, . 3 A.M.	28·363	S	Ditto	0·50
,, . 4 A.M.	28·541	SSE	Ditto	1·05
,, . 5 A.M.	29·104	SSE	Decreasing.	0·80
,, . 6 A.M.	29·447	SSE	Ditto	0·15
,, . 8 A.M.	29·712	SSE	Ditto	0·20

The wind vane was broken between 3 and 4 A.M. and the anemometer between 4 and 5 A.M. The observer recorded the anemometer at 3 A.M. as 399·9 and at 4 A.M. as 106·4. The observer is sure of the latter reading as it is confirmed by the reading of the broken anemometer (*viz.*, 151·4), but thinks it possible that in the blinding wind and rain he may have mistaken 399·9 for 499·9, and this appears to be established by the previous readings of the anemometer. If 499·9 be accepted as the correct reading, it would give a total amount of wind in the hour of 111·5 miles. As it is stated that the wind blew in severe gusts, the wind, when at its strongest during these gusts, probably blew with a velocity of at least 150 miles per hour.

The following extracts are taken from an interesting account of the storm forwarded by the observer, Mr. Carroll, of the Medical Department. "On the afternoon of the 1st at about 2 P.M. rain clouds banking up from the east and north-east overspread the sky. A heavy shower attended with strong winds gave 0·6 inch rain. The wind then abated, and gave no indications of the coming storm until 1 A.M. of the 2nd, when it rose in fierce gusts from the north. The force of the wind increased with great rapidity, and at 2 A.M. it was so strong that it was not possible to mount the ladder to read the anemometer. Between 2 A.M. and 3 A.M. there was a sudden lull, then the wind veered round to south, and at 3 A.M. the cyclone was at its worst. Trees of great size were ripped up by the roots; cocoanut trees were broken off at the crowns like mushrooms; areca-nut trees snapped like match-wood, and the roofs and sides of nearly every building destroyed. H. M. I. M. S. *Enterprise*, which was lying in the harbour before the storm came on, was driven on to the rocks when trying to force her way out, and became a total wreck. All of her crew (79 in number), with the exception of six, were drowned. All the convict barracks, hospitals, bazaars and self-supporter villages were in most instances completely destroyed. The roofs of the public offices and commissariat godowns were scattered over the island. The destruction of the buildings was attended with a considerable loss of life."

"The cyclone," he adds, "burst upon the island with remarkable suddenness about 1 A.M., and in barely two hours' time was at its worst. If there had been any previous indication of bad weather, it would not have escaped the careful watch kept on board the *Enterprise*, and she would have, in that case, attempted to leave the harbour much earlier than she did."

The storm after passing over the Andamans continued to advance for upwards of 24 hours in the same direction as on the 1st. Light to moderate north-east winds (force 1 to 4) obtained on the 1st over the whole of the Bay, excepting the south-east, where weather was squally with moderate south-west winds. Winds were generally stronger on the 2nd over the whole of the Bay, and south-west to west-south-west winds prevailed over a much larger area in the south-east of the Bay than on the 1st. Fine clear weather obtained in the north and west of the Bay, but weather was more or less squally to the south of Lat. 16° N. in the morning and of Lat. 20° N. in the evening and to the east of Long. 86° to 88° E. There was no ship near the storm centre on the 2nd. Its

position at 8 A.M., as indicated by the observed wind directions and pressure distribution, was probably in Lat. 12¼° N. and Long. 91¾° E. and it was advancing at a rate of 12 miles per hour.

The preceding remarks have already indicated that the advance of the storm across the Andamans into the Bay was followed by a general increase of the strength of the winds in the south and centre of the Bay and by the setting in of disturbed squally weather which rapidly extended northwards and westwards. The weather was more or less unsettled over the whole of the Bay on the morning of the 3rd, and squalls were experienced to the south of Lat. 20° N. and east of Long. 84° E. The centre of the cyclone was probably in Lat. 14° N. and Long. 88½° E. at 8 A.M. of the 3rd. The following gives a summary of the observations taken on board vessels nearest to the centre at that hour:—

Ship.	Position.		Barometer (corrected.)	Wind.		Weather during day.
	Lat. N.	Long. E.		Direction.	Force.	
			Inches.			
S. *Eann* .	12° 0′	90°15′	29·72?	Variable.	...	8 A.M. Light unsteady breeze; 10 A.M. wind freshening; noon, strong gale from west; afternoon, heavy to furious squalls with blinding rain; midnight strong southerly gale, hard squalls and heavy rain.
S. S. *Japan* .	15°30′	90°10′	29·89?	E	...	Morning drizzling rain; afternoon hard squalls.
S. *Lena* . .	15° 0′	88°56′	Not recorded.	S to SE.	9	Heavy to terrific rain squalls.
S. S. *St. Regulus.*	18°15″	90°30′	Do.	E	5 to 6	Hard squalls and thick rain.

The storm began to recurve on the 3rd, and during that day moved in a north-westerly direction, and at 8 A.M. of the 4th the centre was probably in Lat. 16½° N. and Long. 86¼° E. There were a considerable number of vessels to the north-east, north, north-west and south-west of the centre on this day, all of which were about the same distance from the centre (150 to 200 miles). The winds experienced by these vessels at that time were cyclonic in direction, but were of moderate force, ranging from 3 to 5, except in one case where the force is given in the log as 7.

The S.S. *Waverley* was in the westerly quadrant proceeding north-eastwards and much nearer to the centre than the vessels named in the preceding table, but her position is not given. She had a strong gale with heavy squalls and a high sea from early morning to 4 P.M.

The storm recurved rapidly through north-north-west and north during the day, and on the morning of the 5th was advancing in a north-north-easterly direction nearly parallel to the coast. The centre at 8 A.M. of the 5th was probably in Lat. 19½° N. and Long. 86½° E. The ship *Agnes* was involved in the storm on the afternoon and night of the 4th and morning of the 5th. She was in about Lat. 19¾° N. and Long. 86½° E. at noon of the 4th, proceeding northwards to Balasore. She had then an east-north-easterly gale, force 9 to 10, with heavy squalls. The weather became much worse during the night. Terrific squalls passed in rapid succession over the ship, and she became a complete wreck before morning, when she was left behind in the south-west quadrant of the storm.

The following gives a summary of the 8 A.M. observations of the 5th at stations and on board vessels nearest to the centre at that hour:—

Ship or Station.	Position.		Barometer (corrected) 8 A.M.	Wind.		Weather remarks.
	Lat. N.	Long. E.		Direction.	Force.	
			Inches.			
S. *Lena* . .	19°55′	89°20′	...	E	6	Cloudy and squally.
S. S. *Lincolnshire*	21° 0′	88°10′	29·78	ENS	6	
S. S. *Japan* .	21°40′	88°20′	29·80	E	5	
S. S. *Canara* .	Near Saugor Island.		29·79	ENE	6	Light rain.
S. S. *Regulus* .	Near Eastern Channel Light Vessel.		...	ESE	9	Very heavy rain, cyclone at midnight.
F. L. V. *Canopus*	Intermediate Station.		29·76	ESE	7	
F. L. V. *Star* .	Lower Gasper Station.		29·75	ESE	5	
Gopalpur .			29·587	WNW	Strong gale.	Continuous rain.
False Point .			29·552	E	Strong	Heavy rain.
Balasore .			29·744	ENE	Strong	
Saugor Island .			29·777	ENE	Strong	Drizzling rain.

The position and character of the storm is accurately known on the afternoon and night of the 5th, as the calm centre passed over False Point and three vessels at the head of the Bay, *viz.*, the S.S. *Regulus*, the F. L. V. *Canopus* and *Star*, during that period.

The barometer began to fall rapidly at False Point at 10 A.M. of the 5th, and an easterly gale had been blowing for at least two hours previously. At 1 P.M. the wind was blowing with hurricane force (from east-south-east). The anemometer was blown away at 1-20 P.M. At 2-30 P.M. the wind is described as 'most terrific' with blinding rain. The barometer was lowest at 3-45 P.M., when the reading (corrected) was 27·976 inches. The wind was decreasing rapidly in force at that time, but it was not until 4-5 P.M. that it ceased and a dead calm set in. This lasted for a short time, and was followed by light variable winds until 4-45 P.M., when the wind came down with hurricane force from north-west and did not begin to moderate until about 6-30 P.M. The barometer at 11 P.M. had risen to 29·7 inches, and the wind, although still from north-west, was moderate in force and accompanied with drizzling rain.

The storm centre passed over the floating light vessels *Canopus* and *Star* between 2-30 A.M. and 3 A M. of the 6th. The *Canopus* had a hard gale with heavy blinding rain squalls at 4 P.M. of the 5th. The wind increased in force until 2-30 A.M. of the 6th, when it suddenly fell calm. The calm lasted only four or five minutes, after which the wind came down from north-west with terrific force. The Commander of the *Canopus* states that in his experience of 16 years he has never seen anything like the heavy rain, thunder and lightning, terrific sea and force of the wind of this storm. The lowest reading of the barometer (corrected) observed on board the *Canopus* was 28·70 inches at 2-40 A.M. of the 6th. The vessel parted from her anchors shortly after that hour, and when the weather moderated was 18 miles south-west of her station.

The F. L. V. *Star* had torrents of rain at 9 P.M. of the 5th. At midnight it was blowing a terrific hurricane and a dangerously heavy sea was running. The calm centre passed over the vessel at about 3 A.M., and lasted about 10 or 15 minutes, after which the wind flew to north. No barometric readings were apparently taken on board this vessel during the storm, as none are given in the account of the storm sent in by the Commander.

The calm centre also passed over the S.S. *Saint Regulus*, which was beating about the Sandheads waiting for a pilot, at 1 A.M., but the information in her log is so vague as to be of no value.

The ship *Lena*, which arrived at the Sandheads on the afternoon of the 5th, felt the full weight of the cyclone during the night of the 5th and morning of the 6th. Her barometer stood at 30·20" at 1 P.M. of the 5th, at which time she had a strong easterly breeze with rain squalls. The barometer fell rapidly during the evening, and was lowest at 1-15 A.M. of the 6th, when it read 28·00". The wind increased to hurricane force at 1 A.M., at which hour the Captain describes the sea and sky as being literally mingled together. The wind suddenly shifted from east to north and west, and it was necessary to cut away the foremast to save the vessel. The wind came down in irresistible gusts in rapid succession roaring fearfully. The wind began to take off at 2 A.M., and gradually abated. At 4-30 A.M. the barometer had risen to 29·30" and the wind was blowing a strong gale. At daybreak the ship was found to be a complete wreck on deck, everything having been blown or washed off.

The storm hence crossed the Sandheads between 2 A.M. and 3 A.M. of the 6th, and was then advancing in a north-east by east or an east-north-easterly direction. It blew a heavy gale during the night at Saugor Island. The lowest reading of the barometer taken by the observer was at 2 A.M., when it was 29·5". The average velocity of the wind as recorded by a Beckley's anemograph was 73 miles per hour between 2 A.M. and 5 A.M.

As the positions of the *Canopus* and *Star* were only about 40 miles south of Saugor Island, the total gradient in that distance was nearly an inch. The gradients in the inner storm area were hence at this time quite as steep as when the storm crossed the Andamans and the rainfall was almost certainly much heavier. The storm when crossing the Sandheads consisted of an inner calm area of at least three miles in diameter, in which the barometer stood at 28·5", an inner area of hurricane winds the diameter of which was at least 100 miles, and an outer storm area in which the winds ranged in force from a moderate to a hard gale of at least 300 miles in diameter.

The storm continued to advance in the same direction during the morning and crossed the coast of the Sunderbunds about 8 A.M. 40 miles to the west of Saugor Island.

The following gives 8 A.M. observations at stations in South Bengal at that hour :—

STATION.	Pressure reduced to sea-level and gravity at Lat. 45°	Variation from normal.	WIND.		Rain of previous 24 hours.	WEATHER.
			Direction.	Velocity in miles per hour during previous 24hours.		
	Inches.	Inches.			Inches.	
Saugor Island .	29·648	—·279	NNW	27	4·18	Severe gale and wind.
Calcutta . .	·721	—·211	NNE	10	0·49	
Jessore . .	·784	—·142	NE	8	0·15	Drizzling rain.
Faridpur . .	·827	—·088	EN E	8	0·12	Do.
Dacca . .	·817	—·100	N E	7	0·10	Fine.
Barisal . .	·784	—·115	Calm	4	0·41	Drizzling rain.
Chittagong .	·819	—·097	E	2	0·11	Over cast.
Silchar . .	·886	—·038	Calm	3	0·12	Do.

No information has yet been received respecting the advance of the storm over the Sunderbunds. The 4 P.M. observations of the 6th at stations in South Bengal indicate that the storm was filling up rapidly at that hour. The following gives a summary of these observations :—

STATION.	Barometer reduced to sea-level and Lat. 45° gravity.	Variation from normal.	WIND.		REMARKS.
			Direction.	Velocity in miles per hour, from 10 A.M. to 4 P.M.	
	Inches.	Inches.			
Saugor Island . .	29·710	—·124	NNW	7	
Calcutta . . .	29·703	—·129	NNW	16	Overcast.
Dacca . . .	29·689	—·139	NNE	3	
Silchar . . .	29·781	—·041	Calm	0	Overcast.
Chittagong . . .	29·708	—·119	SSE	2	Do.

The centre at 4 P.M. was probably a little to the north-east of Barisal and probably nearly midway between Barisal and Dacca.

The storm continued to advance in the same direction during the night of the 6th. Its advance at that time was carrying it into the angle between the Garo, Lushai and Manipur hills and the hills of Upper Burma. These hills

(as in the case of the Backergunge cyclone) offered an effective resistance to the cyclonic motion and the storm filled up very rapidly on the early morning of the 8th. A very shallow residual depression and ill defined cyclonic circulation was still in existence at 8 A.M., but it disappeared before 4 P.M. The following gives (8 A.M.) observations of the 7th which define the position of the residual depression :—

STATION.	Barometer reduced to sea-level and gravity at Lat. 45°.	Variation from normal.	WIND.		Cloud.	Rainfall in 24 hours.
			Direction.	Velocity in miles per hour, during previous 24 hours.		
	Inches.	Inhces.				Inches.
Silchar . .	29·843	—·085	Calm.	1	10	1·19
Mymensing .	29·870	—·052	S-SE	6	8	0·29
Dacca . .	29·875	—·045	W.-NW	10	10	1·00
Noakhali .	29·863	—·046	E.	12	4	0·51
Comilla . .	29·868	—·043	N-E	7	9	3·93

The following table gives the position of the storm centre, and its rate of motion during the existence of the storm :—

Date and hour.	POSITION OF STORM CENTRE.		Distance travelled during interval since previous position.	Mean rate of motion during interval.
	Lat. N.	Long. E.		
October 31st, 8 A.M. .	9° 45?′	100° 0?	...	
November 1st, 8 A.M. .	11° 0 ?′	96° 0?	280 miles.	11·7 miles
,, 2nd, 2-40 A.M. .	11° 41′	92° 42′	220 ,,	11·8 ,,
,, ,, 8 A.M. .	12° 15′	91° 45′	65 ,,	12·2 ,,
,, 3rd 8 A.M. .	14° 0′	88′ 30′	245 ,,	10·2 ,,
,, 4th 8 A.M. .	16° 30′	86′ 15′	225 ,,	9·4 ,,
,, 5th 8 A.M. .	19′ 45′	86° 30′	220 ,,	9·2 ,,
,, ,, 4 P.M. .	20′ 20′	86° 47′	60 ,,	7·5 ,,
,, 6th 2-30 A.M.	Intermediate station.		100 ,,	9·5 ,,
,, ,, 8 A.M.	40 miles east of Saugor Island.		50 or 60	8 to 9 ,,

The preceding statement indicates that the rate of motion when it was advancing on the 31st, 1st and 2nd on an approximately straight north-west by west course averaged 12 miles per hour, but that as it recurved on the 4th, 5th and 6th its velocity diminished to an average of 8 miles on the afternoon of the 5th and morning of the 6th. Its velocity at this stage was hence unusually small considering the intensity of the cyclone.

The following are the most noteworthy features of this remarkable storm :—

1st.—It originated outside the Indian area in the Gulf of Siam or the China Sea, and crossed the Malayan Peninsula in about Lat. 10° N., and thence passed into the Andaman Sea and Bay of Bengal. This part of the Malayan Peninsula is comparatively low ground and offered no resistance to the passage of the cyclone.

2nd.—Its path in the Bay of Bengal recurved to a very unusual extent. As a rule, the tracks of storms in the Bay are approximately straight. The centre of the cyclone in question recurved through north-west, north and north-east to east-north-east and described a curve approximately parabolic in form.

3rd.—The storm was apparently almost unchanged in character from the 30th or 31st to the noon of the 6th. It was during the whole of this period a cyclone with a calm centre, and an inner storm area of 80 to 120 miles in diameter in which hurricane winds prevailed. The storm was, so far as can be judged from the accounts received, as severe in the Gulf of Siam as it was when passing over Port Blair, False Point and the light vessels at the entrance to the Hooghly. It was remarkably persistent and permanent in character during the whole of this period.

4th.—It filled up with very great rapidity shortly after it entered Bengal and as it approached the hills of East Bengal and Assam. The rapidity and completeness of the disintegration of the storm on the night of the 6th and morning of the 7th are even more remarkable than its previous persistence.

5th.—It was remarkable even when compared with previous cyclones in the Bay for the violence of the winds and the excessive rainfall which accompanied it.

6th.—The observations indicate that the heaviest rainfall occurred in front of the advancing storm centre (or in the advancing quadrant), and that winds were most violent in the south and east quadrants.

The depression filled up on the 7th, and the observations of the morning of the 8th showed no trace of its existence. Light northerly winds prevailed on that day in Bengal and Burma and westerly winds in the Gangetic plain. Skies were clear except in Assam and Southern India. Pressure increased rather rapidly on the 8th, and well marked anticyclonic conditions obtained on the 9th in Northern and Central India. Pressure was highest in Central Rajputana and lowest in the Bay, ranging from 30·12″ (at Ajmere) to 29·89″ (at Port Blair) at 8 A.M. of the 9th Pressure gave way rather rapidly over the whole Indian area on the 11th, 12th and 13th and on the morning of the 14th it ranged between 29·96″ (at Peshawar and Jubbulpore) and 29·80″ at Port Blair. A rapid recovery occurred over the Indian land area on the 14th and 15th whilst pressure continued to give way in the south-east and centre of the Bay. On the morning of the 16th pressure ranged from 30·12″ (at Ajmere) to 29·77″ at Port Blair), thus giving a total gradient of ·35 inch.

A well marked depression, at the centre of which pressure was nearly a tenth of an inch below the normal, now covered the centre and south-east of the Bay. The information relative to this part of the Bay is always scanty. The ship *Glenricht* passed through it between the 11th and 14th. The following gives a brief summary of the weather she experienced :—

Date.	Position at noon.		Weather during day.
	Lat. N.	Long. E.	
11th . .	14° 24′	91° 7′	8 A.M. A stiff squall with torrents of rain. Wind was north-east before squall, but hauled to south during the squall. During the remainder of the day light unsteady winds and showery weather.
12th . .	15° 29′	91° 3	Wind south-east to east; light unsteady breezes with cloudy showery weather.
13th . .	16° 21′	91° 40′	Morning, baffling airs, with heavy rain. Afternoon, unsteady winds, weather dark and cloudy.
14th . .	17° 18′	91° 54′	Morning, light unsteady airs, afternoon, light north-east air and fine clear weather.

This vessel hence had very unsteady variable winds with squalls and heavy rain whilst passing through the area in which the storm began to form on the 16th and 17th and as soon as she advanced beyond it she passed into north-east winds and fine clear weather.

The ship *Mobile Bay*, which was dismasted by the cyclone, crossed the equator on the 13th and passed into this area on the 18th. The following gives a summary of the weather she experienced in the eastern half of the entrance to the Bay from the 13th to the 17th :—

Date.	Position at noon.		Weather.
	Lat. N.	Long. E.	
13th .	1° 38′	91° 16′	Morning, wind light from south-south-west; sky overcast; 8 P.M., wind west-south-west and unsteady; weather very unsettled with squalls and heavy rain.
14th .	2° 34′	91° 20′	Morning, light south-west breeze and cloudy; weather squally in evening; lightning to north-west.
15th .	3° 26′	91° 40′	Wind unsteady from south-west with heavy squalls and rain greater part of day.
16th .	No obse	rvation	Light unsteady south-west winds with rain squalls throughout whole day. Sea setting up from north-west.
17th .	6° 8′	90° 57′	Morning, wind south-west; north-west sea; afternoon, squalls with rain, wind hauled to west. Evening, swell from north-west; lightning to east.

These extracts give a summary of the whole of the available information relating to the weather in the south-east of the Bay at this time. They plainly indicate that during the preliminary period of the formation of the shallow depression in the centre and south-east of the Bay, winds were very light and unsteady and weather squally with frequent and probably heavy rain. The Port Blair observations show that winds increased steadily in force from the 10th, when the average velocity, as registered by the anemometer, was 4 miles per hour, to the 16th, when it was 23 miles per hour. The observer, however, notes that winds were variable in direction at 8 A.M. of the 15th and of the 16th, and the weather cloudy and showery, but the rainfall small in amount.

It has already been stated that pressure increased over the whole of India on the 14th and 15th and decreased on the 16th and 17th, and that on the morning of the 18th a depression, in the central area of which, pressure was probably not more than one-tenth of an inch below the normal, covered the centre and south-east of the Bay. The following gives a summary of the observations taken by vessels in the area on the 18th :—

Vessel.	Position at noon.		Weather remarks.
	Lat. N.	Long. E.	
S. *Loch Broom* . .	6° 9′	92° 30′	Wind unsteady from south to south-west; weather very squally with torrents of rain, but fine between the showers; sea smooth.
S. *Mobile Bay* . .	7° 2′	89° 34′	Morning, unsteady south-west wind; north-west swell; heavy rain. Afternoon, fresh south-west wind with squalls and rain.
S. Forteviot . .	7° 9′	90° 51′	South-south-west to south-west winds during day; continued squalls with rain during the whole day. Winds variable in early morning; but increased in force to a fresh breeze in afternoon. Hard squalls during night.
S. *Lyndhurst* . .	9° 55′	89° 33′	South winds with passing showers.

The observations show that the conditions which usually precede cyclonic storms in the Bay of Bengal were present in this case. Winds were very light and unsteady over the area in which the storm was generated, whilst immediately to the south a humid south-west current was established. These winds were not at this stage strong, but the air was surcharged with moisture which was giving rise to frequent or continued squalls with abundance of rain.

The preceding statement gives the most important information respecting the Bay on the 18th. The land observations also indicate that a shallow depression covered the centre and south of the Bay. The marine data establish that southerly winds prevailed over the east of the Bay as far north as Lat. 17°N, whilst north-east to north-west winds blew steadily in the western half of the Bay as far

south as Lat. 7°N. The weather was squally with moderate to heavy rain in the south-east of the Bay.

The barometric changes of the next 24 hours were remarkable. Pressure increased very rapidly in Upper India and decreased moderately in North-Eastern India and the Bay. In the north of the Punjab pressure exceeded 30·10″. An area of depression in which pressure was below 29·80″ covered the centre and south-east of the Bay. The following gives an abstract of the weather observations taken on board ships in that area:—

Vessel.	Position.		Barometer actual (corrected.)	Wind.		Weather.
	Lat. N.	Long. E.		Direction.	Force.	
			Inches.			
S. S. *Baron Elibank.*	6° 34′	82° 28′	...	NE	9	Sea smooth and weather fine; afternoon squally.
S. *Mobile Bay* .	9° 0′	88° 10′	...	SSW	...	Cloudy; squally in evening.
S. *Loch Broom* .	9° 8′	92° 30′	29·84	SSW	...	Morning, fine clear weather; sea smooth. Afternoon, squalls and heavy rain; sea smooth.
S. *Forteviot* .	10° 48′	90° 16′	29·62	SW	5	Morning, hard squalls and heavy rain. Afternoon, occasional squalls with rain.
S. *Lyndhurst* .	13° 23′	90° 49′	...	SSE	2	Clear weathe.
S. S. *Chanda* .	16° 19′	93° 12′	30·11	SSE	6	Cloudy; squally in evening; heavy banks of cloud near horizon.
S. S. *Japan* .	18° 16′	90° 24′	30·09	SE	4	Squally, slight rain.
S. S. *Fultala* .	18° 51′	86° 48′	30·05	NNE	5	Fine and cloudy.

The observations do not enable the character of the storm at this stage to be inferred with certainty. It is most probable that it was in the initial stage. The depression was shallow and extensive and the central area was probably in about Lat. 11½° N. and Long. 87½° E. Weather was more or less squally in the south-east and central portions of the depression, but winds were somewhat unsteady, and it is doubtful whether a regular and complete cyclonic circulation with a definite centre was as yet established. There are slight indications in the observations that the weather, on the whole, became worse during the day.

The pressure changes of the next 24 hours in the Indian land area were small in amount and irregular except in the Punjab, where the barometer fell rapidly. Hence, so far as is indicated by the land observations, the depression and storm in the Bay had not developed at all. The following table gives the observations taken on board ships nearest to the centre of the depression in the Bay at 8 A.M. of the 20th. They clearly indicate that the storm had intensified rapidly since noon of the previous day:—

Ship.	Position at noon.		Barometer (corrected).	Wind.		Weather Remarks.
	Lat. N.	Long. E.		Direction.	Force.	
			Inches.			
S. *Mobile Bay* .	12° 3′	88° 0′	...	SSE	...	8 P.M., hurricane.
S. *Loch Broom* .	12° 20′	91° 33′	29·80	S	3.	Wind unsteady; squally.
S. *Forteviot* .	13° 57′	89° 42′	...	SE	5	Hot sultry weather and steady. Evening, heavy lightning and threatening to south.
S. S. *Japan* .	15° 16′	92° 55′	30·08	S	4	Squally; fine in afternoon; south-western swell.
S. *Lyndhurst* .	15° 33′	91° 44′	...	SSE	1	Showery.
S. S. *Putiala* .	Rangoon river.			Calm	...	Fine. Evening, passed Alguada, light south-westerly wind squally appearance.

The observations of all the vessels except the *Mobile Bay* show that over the greater part of the depression no change had taken place in the weather, except that it was on the whole less squally than on the previous day. The ship *Mobile Bay* at noon of this day was in a position near to that assigned to the centre of the depression on the 19th. The following gives a statement of the weather experienced by that vessel on the 20th. The wind in the early morning was from south and increasing, and the weather squally with heavy rain. At 9 A.M. a heavy squall struck the vessel. The barometer at 2 P.M. was 29·2″ (corrected probably 29·6″) and wind south-east. At 7 P.M. the ship was lying with her lee rail under water and almost on her beam ends. At 8 P.M. it was blowing a hurricane from east, and at 11 P.M. it was blowing with hurricane force from north-east. These observations show clearly that the vessel had passed into the central area during the day, and that she had been carried round from the eastern to the northern quadrant in the interval between noon and midnight. The apparent improvement of the weather in the outer portion of the depression had hence accompanied a rapid development of the cyclonic storm in the inner area of the depression. The position of the centre of the storm at noon of the 20th was probably in about Lat. 11¾° N. and Long. 87½° or 87¾° E. If the position assigned to the centre on this day and the previous day be approximately correct, the storm had commenced to advance in a north-north-easterly direction during the previous 24 hours. Judging from the brief interval during which the winds, experienced by the ship *Mobile Bay*, changed from force 4 to hurricane force, it would appear that the storm proper (as defined by the area in which winds of force 8 or upwards prevailed) was of small diameter, and that this inner storm area formed the

central feature of a large barometric depression which had covered the centre and south-east of the Bay during the previous three or four days.

During the next 24 hours pressure increased over the whole of India, and well-marked anticyclonic conditions obtained on the morning of the 24th in Northern India. The distribution of pressure in the land area gives no indication of the depression in the Bay, except that it was remarkably uniform over the whole coast area of the Bay. The wind directions at the Coromandel Coast stations, which ranged between north and north-west, pointed to the continuance of the same abnormal conditions in the Bay that had characterised it during the previous three days. The following observations, taken on board vessels in or near the storm area on the morning of the 21st, define its position at that time:—

Ship.	Position at noon.		Barometer (corrected).	Wind.		Weather.
	Lat. N.	Long. E.		Direction.	Force.	
			Inches.			
S. S. *Japan* .	12° 44′	94° 34′	29·88	S	5	Cloudy; occasional squalls.
S. *Mobile Bay* .	?	?	?	N	12	Hurricane.
S. *Loch Broom* .	15° 18′	91° 16′	...	S	...	Cloudy; heavy rain squalls.
S. S. *Shahjehan* .	16° 31′	91° 43′	29·90	ESE	4	Cloudy.
S. *Forteviot* .	16° 42′	89° 36′	...	ENE	Unsteady.	

The observations do not enable the position of the storm centre to be accurately determined, but it is probable that it was in about Lat. 12½° N. and Long. 88½° E. The vessels nearest to the storm centre were, with the exception of the *Mobile Bay*, all in the outskirts of the storm area, and were 300 to 450 miles distant from it. They had moderate winds cyclonic in direction and ranging in force from 3 to 5.

The *Mobile Bay* was involved in the storm during the whole of the day. Her barometer at 3 A.M. stood at 28·50″, at which time she had north winds of hurricane force. The wind shifted to north-west at 10 and to west at 11 A.M., by which hour the barometer had fallen to 27·8″. The wind fell almost to a calm from 2 to 4 P.M. The barometer (aneroid) at 4 P.M. stood at 27·5″, which was the lowest graduation of the instrument. It continued to fall for a short time afterwards, and the captain estimated that when lowest the reading was 27·00 inches. Shortly after 4 P.M. the wind blew hard from north-west, and increased to hurricane force. The changes of winds during the day and the length of time the ship was involved in the storm show that she was carried along by it, and at the same time carried round from the easterly to the southerly quadrant and drawn into the central area.

The barometric changes in the Indian land area of the next 24 hours were small in amount and made no important change in the pressure distribution. Pressure had increased slightly in Lower Burma, although it was now in the outer area of the depression and cyclonic storm.

The following gives 8 A.M. observations on board ships nearest to the centre at 8 A.M. of the 22nd:—

Ship.	Position at 8 A.M.		Barometer.	Wind.		Remarks.
	Lat. N.	Long. E.		Direction.	Force.	
			Inches.			
S. S. *Putiala* .	15° 50′	93° 53′	29·82	SSE	9	Cloudy.
S. *Mobile Bay* .	...	...	29·2	...	12	Hurricane.
S. S. *Bhandara* .	17° 55′	83° 55′	29·87	NW	4	
S. *Forteviot* .	18° 20′	89° 5′	29·53	ENE		Cloudy; winds unsteady.
S. *Loch Broom* .	18° 31′	89° 25′	...	E	5	Squally.
S. S. *Shahzada* .	18° 38′	92° 57′	...	E	8	Heavy rainfall.
S. S. *Maharani* .	18° 50′	90° 30′	29·78	E SE	7	
S. S. *Nancoury* .	20° 30′	88° 30′	...	NE		

The only vessel which was near the centre of the storm on the 22nd was the *Mobile Bay*, and her position is not known, as it was not possible to take any observations. So far as can be determined from the whole of the observations, the centre at 8 A.M. was probably in Lat. 13½° or 13¾° N. and Long. 89½° E.

The ship *Mobile Bay* was carried with the storm and drawn round and into the centre on the 21st. She passed out of the calm area about 4 P.M. into the southern gradient, and was carried north-eastwards with the storm during the whole of the night of the 21st and on the 22nd. The main mast went at 6 A.M. of the 23rd, and the foremast shortly afterwards followed. The barometer began to rise at about 6 P.M. of the 22nd, and at 2 A.M. of the 23rd had risen to 28·00. The weather improved rapidly, and at 9 A.M. of the 23rd she had light westerly winds. Her position on the 24th was Lat. 14°53′ N. and Long. 92°24′ E., and fully supports the inference that she had been carried forward by the storm. It may be noted that she was left a complete wreck by the storm and was towed into Rangoon, where the Port Officer after seeing her said he was astounded at her marvellous escape. She was insufficiently ballasted, and sat like a cork in the water, and if the captain had not taken the precaution of fitting the vessel with shifting bulk heads before ballasting her with sand, and of saturating the sand with water at the commencement of the storm, it is almost certain the vessel would have foundered. Her experience is a very strong proof of the double motion in a cyclone, *viz.*, rotatory motion and motion of the draught.

The S. S. *Palamcotta* was in the eastern quadrant of the storm during the day. At midnight she was about 80 miles to the east-north-east of the centre. She had at that time a whole gale to a storm (hurricane) with a very heavy sea.

The *Canara*, which left Rangoon at 5 A.M. of the 22nd,

was rounding the Alguada during the night. As she was passing from the Andaman Sea into the Bay of Bengal, the weather became rapidly worse. She continued to advance towards the storm for some time, and was nearest to the centre (probably about 70 miles to the east-south-east of the centre) between midnight and 4 A.M. The captain then turned the ship south-eastwards. The ship experienced a strong to heavy gale with violent squalls and blinding rain from midnight to 4 A.M.

The *Commillah* left Akyab for Rangoon at 2 P.M. of the 22nd. She had moderate easterly winds during the night.

The storm on the morning of the 23rd was off the Arakan Coast between Diamond Island and Sandoway. The following gives observations taken on board vessels within or near the storm area at 8 A.M. of the 23rd :—

Vessel.	Position.		Barometer (corrected.)	Wind.		Weather.
	Lat. N.	Long. E.		Direction.	Force.	
			Inches.			
S S. *Sirsa* . .	14° 16′	96° 45′	29·90	SSE	5	Cloudy.
S. *Forteviot* . .	18° 5′	89° 30′	...	NE	...	Heavy sea.
S.S. *Commilla* .	19° 50′	92° 30′	29·80	E	5	Sky clear. Heavy cross sea.
S.S. *Kasara* . .	off	Akyab	...	ENE	6	Constant rain.

These vessels were all at a considerable distance from the storm area and were outside the area of strong winds and gales. The centre of the cyclone at 8 A.M. of the 23rd was probably in Lat. 16¾° N. and Long. 93¾° E.

The barometer had fallen rapidly during the previous 24 hours in Burma and skies had clouded over, and moderate to heavy rain was falling. The following gives 8 A.M. data for stations in Central and Lower Burma :—

Station.	Barometer corrected and reduced to 32° and sea-level at gravity Lat. 45.°	Variation from normal.	Wind.		Rainfall of past 24 hours.
			Direction.	Velocity in miles per hour.	
	Inches.	Inches.			Inches.
Akyab . . .	29·784	—·164	NE	7	1·16
Thayetmyo . .	·873	—·073	N	10	0·56
Toungoo . .	·866	—·076	NNW	3	0·12
Rangoon . .	·787	—·147	ESE	7	0·83
Bassein . .	·734	—·191	SE	16	2·83
Diamond Island .	·721	—·201	SSW	32	3·17

The centre crossed the coast a little to the south of Sandoway about 11 A.M. or noon of this day. The Arakan hills in the neighbourhood of Sandoway are of moderate elevation, not exceeding 2,000 feet. Those hills offered an effective resistance and broke up the cyclonic motion very rapidly.

On the morning of the 24th a residual depression covered Central Burma. It had no definite centre, and the air movement was very irregular, thus indicating that the cyclonic circulation had been completely broken up. The following gives 8 A.M. data of the 24th for stations in Central and Lower Burma :—

Station.	Barometer corrected and reduced to 32° and sea-level at gravity at Lat. 45°.	Variation from normal.	Wind.		Rainfall of 24 hours preceding 8 A.M.
			Direction 8 A.M.	Velocity in miles per hour.	
	Inches.	Inches.			Inches.
Akyab . . .	29·865	—·089	NE	4	Nil
Thayetmyo . .	·899	—·053	N	14	3·32
Toungoo . .	·875	—·072	Calm	3	0·98
Rangoon . .	·844 ?	—·098 ?	SSW	?	2·43
Bassein . .	·862	—·071	S	11	0·61
Diamond Island .	·853	—·073	WNW	9	0·04

The depression filled up completely during the day. Burma continued to receive light to moderate showers on the 25th, after which fine clear weather with northerly winds was re-established.

The cyclone was one of great intensity and considerable extent. It was generated in the central area of the Bay midway between the Andaman and the Coromandel coast. For some days previous to its generation squally weather with strongish unsteady south-west winds prevailed in the south-east of the Bay, and a shallow depression covered the Bay, the axis of which ran in an abnormal direction, northwards instead of westwards. The cyclonic storm was formed in the centre of this area of depression on the 18th and 19th and developed with great rapidity on the 20th and the 21st. It was a storm of great intensity with a calm central area (in which pressure was probably considerably below 28·00″), and an inner storm area of hurricane winds surrounding this central area.

The storm advanced along a track, which storms occasionally follow in November, *viz.*, north-east towards the Arakan Coast and Central Burma. They usually follow this course in November when the pressure is much higher than usual in the Peninsula (especially relatively to the east of the Bay and Burma). The storm increased in extent as it advanced north-eastwards and its velocity was rapidly accelerated as it approached land. It crossed the Arakan coast to the south of Sandoway about noon of the 23rd. It filled up very rapidly during the day under the obstructive action of the Arakan hills. On the morning of the 24th there was a small residual depression in Central and Lower Burma, in which the winds were irregular, thus showing that the cyclonic circulation had been completely broken up.

The following gives the position of the centre and its mean rate of advance of the storm at different times during its existence :—

Date and hour.	Position of storm.		Distance travelled during interval since previous position.	Average rate of motion during interval.
	Lat. N.	Long. E.		
20th, 8 A.M. . .	11¾°	87¾°	...	...
21st, 8 A.M. . .	12½°	88½°	72 miles	3·0 miles.
22nd, 8 A.M. . .	13½°	89½°	90 ,,	3·8 ,,
23rd, 3 A.M. . .	16°	92½°	260 ,,	13·7 ,,
,, 8 A.M. . .	16¾°	93¾°	96 ,,	19·2 ,,

Weather in the Bay of Bengal and Arabian Sea.

The weather in the Bay of Bengal during the cyclones of the month has been very fully dealt with in the preceding section, and it is hence sufficient to give a very brief summary of the chief features of the month.

At the end of the previous month light to moderate north-east winds, force 1 to 4, obtained over by far the greater part of the Bay. Weather was squally with light south-west breezes in the south-east of the Bay and the South Andaman Sea. A cyclone entered the Andaman Sea on the 1st, and passed along a curved track to the coast of Orissa and thence across the Sandheads into South-East Bengal. It was accompanied with hurricane winds in the inner area and strong winds in the outer storm area.

The S. S. *Enterprise* was wrecked in Port Blair Harbour with the loss of all her crew, except six natives. The P. V. *Coleroon* foundered with all hands, the ship *Agnes*, S. S. *Lincolnshire*, *Waverley*, and *Saint Regulus* all suffered more or less, and the F. L. V. the *Canopus* and *Star* were driven from their stations. The storm gave very strong winds over the north and east of the Bay. The storm, when it crossed the Sandheads at 3 A. M. of the 5th, was the most dangerous and severe that has visited the head of the Bay for many years. The centre crossed the coast about 8 A. M. of that day, and the sea and wind went down with wonderful rapidity. The S.S. *Wildcraft* in Lat. 16°7′ N. and Long. 85°33′ E. at noon of the 6th, had light airs and calms, and the S. S. *Tronopolis*, in Lat. 18° 47′ N. and Long. 84° 43′ E. at the same hour, had light variable airs. The S. S. *Lincolnshire* near the entrance to the Hooghly had north-north-west winds force 2 at 4 P.M. The great majority of the vessels waiting to enter the river Hooghly reported light to moderate breezes with a slight sea at 4 P. M.

On the morning of the 7th the weather was fine and clear with light northerly airs and calms and a smooth sea at the head of the Bay and fine with light variable winds in the centre of the Bay.

Winds increased during the next two or three days off the Coromandel Coast, and weather was squally with moderate rain. Winds on the 12th and 13th fell off in strength in the south-east of the Bay in the neighbourhood of the Nicobars, and calms or variable airs prevailed for some days in that part of the Bay. Very heavy rain showers were experienced by the few vessels passing through that area at this time. The rainfall simultaneously decreased in the Madras Coast districts. On the 16th and 17th, north-westerly winds of force 1 to 3 prevailed over the north and centre of the Bay. Light north to north-west winds obtained off the Madras Coast and light variable airs to the west of the Andamans and Nicobars, whilst at the entrance to the Bay moderate but unsteady south-west to west winds were blowing. A depression and cyclonic storm formed and developed in about Lat. 12° N. and Long. 88° E. on the 18th and 19th. On the 20th a small but intense cyclone near the centre of which winds were of hurricane force, was in existence and advancing in a north-north-easterly direction. Winds increased in the south-east and centre of the Bay and blew in that part of the Bay outside of the storm area proper with force ranging from 6 to 8 or 9 (or from strong breeze to a moderate gale). The cyclone advanced with increasing rapidity on the 21st and 22nd, curving to the north-east and crossed the Arakan Coast on the morning of the 23rd. At the head of the Bay weather was cloudy on the 22nd and 23rd with north-north-east winds of force 3 to 4.

Weather was disturbed with strong winds for 24 hours afterwards in the east of the Bay and Andaman Sea, but on the 25th fine weather with light to moderate winds prevailed generally. During the remainder of the month the ordinary weather conditions of the period prevailed in the Bay, except that winds were lighter than usual off the Coromandel Coast, and weather more squally and winds less steady to the west of the Nicobars and at the entrance to the Bay.

Arabian Sea.—A moderate north-east monsoon (force of winds 2 to 5) prevailed at the beginning of the month over the north and centre of the Arabian Sea. Weather was very squally with strongish west-south-west winds off the Ceylon Coast and south-east winds off the Malabar Coast. Very heavy rain fell in the area between the Maldives and Laccadives and the Malabar Coast on the 1st and 2nd which generated a small storm. It advanced westwards to the north of Minicoy on the early morning of the 3rd. The S. S. *Fultala* had west-south-west winds (force 5) near Colombo on the 2nd. These humid winds advanced northwards along the Malabar Coast during the next three days as far as Lat. 14° or 15° N. and gave frequent thunderstorms and rain in Malabar and the South Konkan and the adjacent sea area. The S. S. *Fultala* had south-east winds on the 5th in Lat. 11½° N. and Long. 75° E. and the S. S. *Nizam* off Tellicherry on the 6th had east-south-east winds (force 6) with heavy squalls and continuous rain. These conditions prevailed until the 9th, when northerly winds again set in off the Konkan and North Malabar Coast. Thus the S. S. *Buidana*, in Lat. 8° 18′ N. and Long. 76° 56′ E. at noon of the 10th, had west-north-west winds and squally weather. On the 12th variable winds prevailed off the West Ceylon Coast and north-east winds, force 2 to 4, in the north and centre of the Arabian Sea. Winds were very unsteady with frequent showers off the Malabar and West Ceylon coasts from the 15th to the 22nd. Ordinary north-east monsoon winds, force 2 to 4, and fine weather prevailed and continued during this period over the greater part of the Arabian Sea. Light northerly winds set in off the West Ceylon Coast on

the 22nd. The S. S. *Clan Drummond* had heavy rain squalls (force 6) from the north-east in Lat. 13° 30′ N. and Long. 50° 11′ E. on the 23rd.

During the last week of the month weather was showery off the Ceylon Coast with unsteady northerly winds. Over the whole of the Arabian Sea north-east monsoon winds, force 2 to 5, prevailed, and the weather was, so far as is indicated by the available information, everywhere fine with passing clouds.

Temperature of the Air.

The distribution of temperature in India for November 1891 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. The continuous lines indicate that the temperature was in excess by the amount indicated by the number given near the line, and the broken lines 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 data by means of which these charts have been prepared are given in Table I. The mean maximum and minimum temperatures have been obtained for each station from the observations of the same number of years, *viz.*, 1878 to 1888. 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 amounts, which vary from month to month. But the variation of the mean daily temperature from the normal, as determined by the use of this definition, agrees in almost all cases very closely with the variation as determined by the use of true daily means based on readings at 16 hours, in addition to those 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.

The mean minimum temperature of the month was above the normal over the whole of Northern India except North Bengal, North Bihar, Assam and Burma; and in defect over the Peninsula except South Madras, where it was slightly above the normal. The excess was generally small in amount in Bengal and Burma, but was large in North-Western India, in which it ranged from 2° to 5°. It was largest in Beluchistan, the Punjab and Upper Sind at the following stations:—

PROVINCE.	STATION.	Variation of mean minimum of month from normal.
Punjab	Peshawar	+5·1°
	Sirsa	+5·2°
	Dera Ismail Khan	+4·9°
Sind	Jacobabad	+5·2°
Beluchistan	Quetta	+4·8°

The deficiency in the night temperature in the Peninsula was greatest in the West Deccan, Berar and Khandeish and at Indore, in which it ranged from 2° to 4°. It was greatest in the area represented by the following stations:—

STATION.	Variation of mean minimum of month from normal.
Indore	—4·0°
Khandwa	—4·1
Malegaon	—4·1
Akola	—3·5

The mean maximum temperature of the month was in excess of the normal except in Lower Burma and Orissa, where there was a small local deficiency. The excess was more than 2° in amount in Bihar and Chota Nagpur, the Deccan and Madras Coast districts, and in Sind, Rajputana and the South-West Punjab. The excess was over 3½° at the following stations in these areas:—

PROVINCE.	STATION.	Variation of mean maximum of month from normal.
Beluchistan	Quetta	+6·6°
Sind	Jacobabad	+4·3
	Hyderabad	+5·1
Rajputana	Deesa	+4·7
Deccan	Secunderabad	+4·0
	Poona	+3·7
	Masulipatam	+3·8
	Bangalore	+3·8

The preceding data have shown that in Northern and North-Western India the variations of the night and day temperature from the normal were of the same kind or sign, whereas in the Deccan and the Peninsula generally they were opposite in kind and nearly equal in amount at the majority of stations. The mean temperature of the month hence differed slightly from the normal in the Peninsula, North-Eastern India and Burma. It was in excess in these areas, except in Central Burma, the Assam Valley, the West Deccan, parts of Central India, Berar and the Central Provinces, where it was in slight defect. The variation was less than 1½° over the whole of India to the east of a line joining Surat and Roorkee except at the following stations :—

PROVINCE.	STATION.	Variation of mean temperature of month from the normal.
		°
Bihar	Patna	+2·3
	Gaya	+1·9
Chota Nagpur	Hazaribagh	+2·0
Bengal	Chittagong	+1·5
	Barisal	+1·7
Madras	Vizagapatam	+2·9
	Salem	+2·1
	Negapatam	+1·9
Mysore	Bangalore	+1·5
Central Provinces	Khandwa	−2·1
Central India	Indore	−1·5

The mean temperature was more than 2° in excess in Beluchistan, Sind, the western districts of the Punjab and Rajputana and at the hill stations of the Himalayas. The excess was more than 4° in amount at the following stations, which hence defined the area of greatest excess of temperature during the month :—

PROVINCE.	STATION.	Variation of mean temperature of month from the normal.
		°
Beluchistan	Quetta	+5·7
Sind	Jacobabad	+4·8
	Hyderabad	+4·3
Punjab	Sirsa	+4·1

The temperature variations of the month were hence strongly marked.

The following gives a brief statement of the more important temperature changes of the month.

The temperature conditions at the beginning of the month were similar to those of the last week of October. The following gives variation data for the 1st :—

DISTRICT.	VARIATION OF		
	Mean maximum temperature from the normal.	Mean minimum temperature from the normal.	Mean temperature from the normal.
	°	°	°
Burma	+2·4	+0·3	+1·4
Bengal	+1·3	−3·6	−1·2
North-Western Provinces	−2·3	+0·2	−1·1
Punjab	−0·7	+6·0	+2·7
Bombay	+3·0	−0·3	+1·4
Berar and Central Provinces	−1·4	−3·5	−2·5
Guzerat and Central India	−1·2	+0·1	−0·6
Sind and Rajputana	+1·9	+2·2	+2·1
Madras	+2·1	0	+1·1

During the passage of the cyclone of the first week of the month over the Bay, skies were partially clouded over the greater part of India, and both the night and the mean temperatures increased to some extent. As usual a considerable fall of temperature occurred over the areas of rainfall during the storm, and chiefly in Burma, Bengal, Orissa and North Madras (Ganjam). The following temperature data for the 7th, when compared with the data for the 1st, show the large temporary changes of temperature caused by the cyclone :—

DISTRICT.	VARIATION OF		
	Mean maximum temperature from the normal.	Mean minimum temperature from the normal.	Mean temperature from the normal.
	°	°	°
Burma	−1·8	+1·0	−0·4
Bengal	−4·8	−1·6	−3·2
North-Western Provinces	+0·2	+1·1	+0·7
Punjab	−1·3	+2·7	+0·7
Bombay	+2·3	+1·6	+2·0
Central Provinces	+2·3	+3·6	+3·0
Guzerat and Central India	0	+0·3	+0·2
Sind and Rajputana	−0·1	+1·2	+0·6
Madras	+4·1	+0·8	+2·5

The skies cleared again on the 8th over North-Eastern India, and became more clouded in Southern India, where showers giving light to moderate rain were received from the 9th to the 14th or 15th. During this period the temperature conditions reverted to those which had prevailed during the last fortnight of October and the first week of November, *viz.*, deficient temperature in Central India, the Central Provinces and the North Deccan, and increased temperature in the remainder of India, the excess being greatest in Sind, West Rajputana and the South-West

Punjab. The following table gives temperature variation of the 12th, a day fairly typical of this period :—

District.	Variation of		
	Mean maximum temperature from the normal.	Mean minimum temperature from the normal.	Mean temperature from the normal.
Burma	+2°0	−0°8	+0°6
Bengal and Assam	+1·6	+0·9	+1·3
North-Western Provinces and Oudh	+0·1	+2·0	+1·1
Punjab	+3·3	+4·6	+4·0
Bombay	+2·5	−1·9	+0·3
Central Provinces and Berar	−0·2	−3·8	−2·0
Guzerat and Central India	+2·5	−2·6	−0·1
Sind and Rajputana	+4·9	+2·4	+3·7
Madras	+1·9	−0·5	+0·7

A small depression appeared in Upper India on the 17th and broke up on the 19th. A marked increase of temperature occurred in the Punjab, Sind and Rajputana on the 17th and 18th which was followed by a moderate reduction on the 19th and 20th. The reduction was largest in the Punjab, in which area local showers occurred. The following table gives data illustrating these temperature changes :—

District.	Variation from the normal of the mean temperature of the 24 hours preceding 8 A.M. of the				
	16th.	17th.	18th.	19th.	20th.
Punjab	+3°6	+4°1	+6°3	+2°2	+1°1
Rajputana and Sind	+3·7	+4·8	+5·0	+3·6	+1·5

The following give variation data for the 19th, on which day the second cyclone of the month began to form in the Bay :—

District.	Variation of		
	Mean maximum temperature from the normal.	Mean minimum temperature from the normal.	Mean temperature from the normal.
Burma	+2°6	+0°8	+1°7
Bengal and Assam	+1·4	+0·3	+0·9
North-Western Provinces and Oudh	+2·1	+4·4	+3·3
Punjab	+0·2	+4·2	+2·2
Bombay	+2·0	−3·1	−0·6
Central Provinces and Berar	+1·5	−1·4	+0·1
Guzerat and Central India	+2·4	+1·3	+1·9
Sind and Rajputana	+4·3	+2·9	+3·6
Madras	+1·3	−2·4	−0·6

The second cyclonic storm of the month formed to the west of the Andamans and advanced by a curved path into Central Burma, where it broke up on the 24th. It gave a moderate burst of rain to Burma which caused a large reduction of temperature in that province.

The following temperature variation data of the 24th show the amount of reduction of temperature in Burma caused by the storm :—

District.	Variation of		
	Mean maximum temperature from the normal.	Mean minimum temperature from the normal.	Mean temperature from the normal.
Burma	−9°1	−0°6	−4°9
Bengal and Assam	+2·6	+1·8	+2·2
North-Western Provinces and Oudh	+1·3	+2·4	+1·9
Punjab	+1·0	+1·9	+1·5
Bombay	+0·1	−6·0	−3·0
Central Provinces and Berar	−0·5	−1·3	−0·9
Guzerat and Central India	0	−2·4	−1·2
Sind and Rajputana	+1·1	+2·3	+1·7
Madras	+2·6	−2·8	−0·1

At Thayetmyo the maximum or day temperature on the 24th was 17·7° below the normal and the minimum 3·0° below it.

During the remainder of the month weather was fine and clear over the whole of India except the coast districts of South Madras and Malabar where light to moderate showers were received. Temperature was in excess during this period over the whole of India, the excess increasing fairly steadily until the end of the month when temperature was very considerably above the normal. The following table, giving temperature variation data for the 30th, indicates fully the temperature conditions which obtained at the end of the month :—

District.	Variation of		
	Mean maximum temperature from the normal.	Mean minimum temperature from the normal.	Mean temperature from the normal.
Burma	−1°5	−1°4	−1°5
Bengal and Assam	+1·4	+1·6	+1·5
North-Western Provinces and Oudh	+1·1	+4·6	+2·9
Punjab	+2·8	+7·2	+5·0
Bombay	+3·0	+0·4	+1·7
Central Provinces and Berar	+2·6	+1·9	+2·3
Guzerat and Central India	+2·7	+1·6	+2·2
Sind and Rajputana	+4·8	+3·0	+3·9
Madras	+3·7	+2·0	+2·9

The following table giving the variations of the mean temperature, week by week, during the month in the larger provinces shows clearly the larger changes of temperature:—

Province.	Variation of mean temperature from normal for week ending November				Variation of mean temperature of month from normal.
	7th.	14th.	21st.	28th.	
Burma	−0°1	+0°9	+0°9	−3°3	−0°6
Bengal and Assam	−0·4	+0·1	+0·9	+1·7	+0·8
North-Western Provinces and Oudh	+0·3	+0·5	+2·3	+1·2	+1·2
Punjab	+2·2	+2·6	+3·1	+2·0	+2·6
Bombay	+0·3	+1·2	−0·8	−1·9	−0·2
Central Provinces and Berar	−0·7	−0·8	0	−0·3	−0·2
Guzerat and Central India	−0·2	0	+1·7	+0·2	+0·4
Sind and Rajputana	+2·4	+2·5	+3·3	+2·9	+3·0
Madras	+1·4	+1·4	+0·4	+1·1	+1·2

Winds.

The mean wind directions for each month are the trigonometrical resultant of the winds given under each of the eight cardinal points, and are calculated by means of Lambert's formula, in which an equal weight or value is given to every wind.

The mean wind directions at 8 A.M. during the month are shown in Plate I by arrows flying with the wind. They are obtained by the use of Lambert's formula, in which an equal value is given to every wind. The data are given in Table I. The mean wind directions derived from the wind observations at 10 A.M. and 4 P.M. are given in the small chart, No. 4 of Plate III, by means of arrows flying with the wind. The data for these will be found in Table II, together with the normal directions obtained from the observations of the past 10 to 20 years.

The normal air movement in the month of November is similar to that of the month of October over the greater part of India. Light north-westerly to westerly winds prevail in the Gangetic plain, and feeble easterly winds in the Assam valley. This air movement is continued as a southerly current, giving northerly winds in Bengal and north-easterly winds over the north and centre of the Bay. In Rajputana light northerly winds prevail, and in Central India and the Central Provinces north-east to easterly winds. North-easterly winds obtain on the Madras Coast districts and are continued as easterly winds in the Deccan and Mysore. This air movement feeds into and forms part of the south-westward air motion or north-west monsoon current over the whole of the Arabian Sea except the most southern portion. In the south of the Arabian Sea and Bay of Bengal winds are somewhat variable. Humid south-west winds usually prevail during the greater part of the month. In the Bay of Bengal these south-west winds are continued as south, south-east, east and north-east winds, and hence the north-east winds which usually prevail in this month on the Coromandel Coast are humid rain-giving winds.

In November 1891, winds were on the average of the month lighter and less steady than usual in the Punjab and the western districts of the North-Western Provinces. The average daily air movement, as indicated by the anemometer, was less than 36 miles. In the eastern districts of the North-Western Provinces winds were of normal strength and steadiness. The northerly element was much more predominant than usual. This was mainly due to the two important cyclonic storms of the month which influenced the wind directions largely in North-Eastern India. The effect of these storms is shown very strikingly in the wind data of the Bengal stations, at which winds were much stronger than the average, and the normal westerly element in the mean wind directions was in many cases replaced by an easterly component. The following gives examples :—

Station.	Wind direction.		Daily Velocity.	
	Mean, November 1891.	Normal mean, November.	Mean, November 1891.	Normal mean, November.
			Miles.	Miles.
Calcutta . . .	N 11° E	N 17° W	82	68
Dacca . . .	N 17° E	N 17° W	85	46
Hazaribagh . . .	N 22° E	N 42° W	130	104

Winds were slightly stronger in the Assam valley. The deflection of the mean direction of the winds from the normal mean at Saugor Island and False Point was, as is very frequently the case, opposite to that at stations in the interior of Bengal, *i.e.*, winds were less easterly than usual :—

Station.	Wind direction.		Daily Velocity.	
	Mean, November 1891.	Normal mean, November.	Mean, November 1891.	Normal mean, November.
			Miles.	Miles.
Saugor Island . .	N 2° W	N 5° E	213	154
False Point . . .	N 15° E	N 22° E	201	158

The westerly deflection was the same in amount at both stations, *viz.*, 7°.

A similar deflection is shown by the winds in the Central Provinces, in which the north-easterly winds of the month contained a much feebler easterly element than usual. Winds were of normal strength and steadiness. The following table gives data of three stations :—

Station.	Mean win direction, November 1891.	Normal mean wind direction, November.	Decreased easting of winds, November 1891.
Nagpur	N 27° E	N 60° E	33°
Pachmari	N 29° E	N 52° E	23°
Khandwa	N 32° E	N 63° E	31°

The westerly deflection in these cases was very large, and was approximately uniform in amount at the observing stations of the Central Provinces.

Winds were of normal strength on the Bombay Coast, but were much less steady than usual. Thus at Bombay the percentage indicating steadiness was only 33, the normal being 59. The mean directions at the Bombay Coast stations varied somewhat irregularly from the normal, but generally indicated a less amount of westing or greater amount of easting in the northerly winds of the month

than usual. In the Deccan and Madras Coast districts the easterly element of the winds was abnormally weak. This was due to the unusual prevalence of north-westerly winds during the two large cyclonic storms of the month.

The following data for typical stations illustrate this feature:—

STATION.	Mean wind direction, November 1891.	Normal mean wind direction, November.	Deflection.
Vizagapatam	N 34° E	N 75° E	—41° E
Madras	N 19° E	N 61° E	—42° E
Bellary	N 75° E	N 80° E	— 5° E
Belgaum	N 68° E	N 84° E	—16° E

Winds were somewhat irregular at the Arakan and West Pegu Coast stations. The deflection of the northerly winds from their normal direction was generally opposite to that on the west coast of the Bay, *i.e.*, the winds contained a stronger easterly component than usual. This is shown by the following data:—

STATION.	WIND DIRECTION.		Deflection.
	Mean of month.	Normal mean.	
Akyab	N 23° E	N 6° W	+29° E
Diamond Island	N 81° E	N 59° E	+22° E

The influence of the cyclonic storms in modifying the wind direction was shown even more strongly at Port Blair, where the mean wind direction of the month was S. 29° E., the normal being N. 63° E. Winds were stronger and on the whole steadier than usual in Pegu. They were considerably stronger (46 per cent.) at Port Blair, but somewhat less steady than usual.

The preceding discussion has indicated that the mean air motion or circulation of the month was very largely modified by the unsettled weather and cyclonic storms of the month.

The history of the Port Blair cyclone has shown that the winds in the central storm area were of exceptional severity and violence. The wind-vanes and anemometers were blown away at four registering stations, *viz.*, Port Blair, Puri, False Point and Shortt's Island. Hence it is not possible to give a statement of the greatest intensity of the hurricane winds near the centre of this storm from actual instrumental observation. The following gives the mean force or velocity of the strongest winds actually measured during the storm by the anemometer at certain stations:—

STATION.	Mean velocity of strongest winds actually registered by the observer during the storm.
Port Blair	116·9 miles from 2 A.M. to 3 A.M. on the 2nd.
False Point Light-House	68 miles per hour on the m rning of the 5th, some me after the instrument was blown away.
Puri	96 miles from 8 P.M. to 9 P.M. of the 4th.
Shortt's Island	64 miles from 3 P.M. to 4 P.M.
Saugor Island	231 miles from 2 A.M. to 5 A.M. of the 6th.

At False Point, Puri and Shortt's Island the amounts given are for periods several hours before the storm was at its worst. It is also noted by the observers at these stations that the wind blew in tremendous gusts or squalls, and that between the squalls the winds were not nearly so strong and were occasionally feeble. The captain of the ship *Lena*, which passed very near to the centre of the storm in the north-west angle of the Bay, describes this feature of the storm winds very forcibly in the following terms:—"The wind came down in irresistible gusts in rapid succession and roaring fearfully."

As the amounts given on the preceding table are the integrated results of the winds during the squalls and the intervals of comparatively feeble winds, it is almost certain that the wind blew with a velocity of 150 to 200 miles in the strongest squalls or gusts in the inner storm area near the central calm area.

Humidity and Cloud.

The hygrometric data for 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 the minimum of the vapour tension and humidity at the same hours, and also the daily means of these elements. The hygrometric data are taken from the tables given in the *Vade Mecum* which are 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 five to twenty 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 five to twenty-five years of the available cloud data for the same hours.

There was in November 1891 a larger amount of aqueous vapour present in the air than usual in the Punjab, the North-Western Provinces and Bihar. As temperature

was slightly above the normal the humidity variations were generally small. In the central and western districts of the North-Western Provinces, the humidity was however considerably above the average. The excess was greatest at Meerut (+11), Lucknow (+10), and Agra (+9). The excessive humidity in that area was apparently a residual effect of the heavy rainfall in the months of August and September.

The air was slightly drier in Bengal and Assam. The deficiency was most marked at Darjeeling (where the humidity was 12 in defect) and Calcutta where it was 7 in defect.

The air contained much less vapour in Rajputana, the western states of Central India, Berar and the Central Provinces. Although over a part of the area the mean temperature was below the normal, the humidity was considerably in defect, the deficiency being on the whole greatest in the Central Provinces. The following gives the more noteworthy variations in these areas:—

Province.	Station.	Vapour tension.			Humidity.		
		Actual.	Normal.	Variation.	Actual.	Normal.	Variation.
		Inches.	Inches.	Inches.	%	%	%
Berar	Buldana	·312	·405	—·093	39	51	—12
	Chikalda	·310	·367	—·057	47	56	— 9
Central Provinces.	Sironcha	·513	·571	—·058	61	68	— 7
Rajputana (Ajmere).	Deesa	·236	·279	—·043	26	34	— 8

The air was also very dry in the Deccan and the Konkan. This was chiefly due to the large deficiency in the amount of moisture in the air. The deficiency was greatest at the following stations in the Circars and the West or Bombay Deccan:—

Area.	Station.	Aqueous vapour pressure.			Humidity.		
		Mean of month.	Normal mean.	Variation.	Mean of month.	Normal mean.	Variation.
		Inches.	Inches	Inches.	%	%	%
Circars	Vizagapatam	·616	·656	—·040	55	66	—11
West Deccan	Sholapur	·380	·462	—·082	45	52	— 7
	Poona	·323	·420	—·097	39	47	— 8

The humidity was almost as largely in defect at the Bombay Coast stations as in the Bombay Deccan.

The variations in South Madras were small and of little importance.

In Burma and at Port Blair the aqueous vapour pressure was slightly less than usual, and the mean humidity was generally below the normal of the month by small amounts.

The amount of cloud in November is always small in the Punjab, Rajputana, Sind, Central India and the North-Western Provinces, and averages very nearly 1 over the whole of that area. In November 1891, there was a slight excess in the Punjab, and a general deficiency in the North-Western Provinces and Central India, where the skies were unusually serene. Thus at Lucknow the mean cloud amount was nil, at Sutna 0·1, at Agra 0·2, at Allahabad 0·3 and at Nowgong 0·3. These stations define the area in which there was the least cloud during the month.

The amount of cloud was also slightly below the average in Bihar and the western districts of Bengal, but was considerably above it in East Bengal and Assam and over the greater part of Burma. The average amount in Bengal was greatest at Chittagong (4·9 or 2·0 in excess of the normal) and Saugor Island (4·0 or 1·2 in excess). In Burma the excess was greatest at the coast stations of Diamond Island (+1·2) and Akyab (+1·0). The average amount of cloud at Port Blair was 6·7, which was 1·7 above the normal.

The amount of cloud was largely deficient in the Central Provinces, Berar, the Deccan and the Bombay Coast districts. The normal average amount in these districts usually ranges from 2 in the Konkan and Central Provinces to 4 in the South and East Deccan. The mean cloud amount of the month of November 1891 in the Central Provinces was 0·5, the normal amount being 2·0. Skies were most serene in that area at Khandwa where the actual amounts averaged only 0·1. The mean cloud amount in the Bombay, Deccan and Konkan was only 1·3 and was 1·1 below the normal average amount (2·4).

The cloud amount was as largely in defect in North and Central Madras as in the Deccan. It was on the other hand in slight excess in South Madras. The following gives data for representative stations:—

Province.	Station.	Cloud Amount.		
		Actual.	Normal.	Variation.
North Madras	Vizagapatam	4·2	5·0	—0·8
	Madras	4·2	6·1	—1·9
	Trichinopoly	5·6	7·1	—1·5

Rainfall.

Rainfall observations are made at upwards of 2,000 stations in India. The hour 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 officer in the various provinces, and published in the provincial gazettes. A weekly statement of the rainfall is telegraphed to the Simla Meteorological Office from every district, and a summary of

this information is published in the *Gazette of India* weekly.

The charts, illustrating the distribution of rainfall in November 1891, are based in part upon the rainfall data of the meteorological observatories throughout India, and in part on the rainfall information relating to the month telegraphed to Simla by district officers.

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 155 meteorological stations. The distribution is shown by means of isohyetic lines or lines of equal amounts of rainfall, the numbers attached to each line indicating the rainfall. The line of no rainfall is indicated by two parallel lines separated by a short interval, one continuous and the other dotted, the latter facing the districts of no rainfall.

The second chart, illustrating the distribution of the rainfall of the month, is given in Plate V, and shows by figures the variations of the mean actual rainfall of the month from the normal rainfall in each of the 52 meteorological districts into which India and Burma have been divided for purposes of comparing crops and rainfall. The data of that chart are derived from the rainfall information telegraphed by district officers.

Rainfall in November is generally due solely to the retreating south-west monsoon current in the Bay of Bengal. Under normal conditions the air current recurves in the Bay and advances as a north-east current to the Madras Coast districts, the Deccan and Southern India, to which it usually gives frequent moderate rain. The retreating current is however necessarily a weak and unsteady current. Hence the rainfall due to it is subject to even greater irregularities 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 storms in the majority of cases advance westwards to the Madras Coast, but occasionally march along a northerly track into Orissa, or a north-east 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 average rainfall of the whole of North-Western and Central India, including the Punjab, Sind, Rajputana, North Bombay, Central India, the North-Western Provinces, and Bihar, is small in amount, not exceeding two or three tenths of an inch. Bengal, Assam, Berar and the Central Provinces, which receive rain in the outskirts of the cyclonic storms of the month, have slightly larger rainfalls. In Bengal the average rainfall decreases from an average of two inches in the coast districts of Orissa and East Bengal to two-tenths of an inch in North Bengal and Bihar. Similarly in Burma the average rainfall of the month decreases from four inches in the coast districts to half an inch in the central districts of Upper Burma.

The rainfall in Madras and the Deccan is of great importance. In the South Coromandel districts the average rainfall of the month slightly exceeds 15 inches. The amount decreases rapidly into the interior to an inch in the South Deccan and slowly northwards along the coast districts to Ganjam, where the average is nearly three inches.

The chart (Plate IV) of the distribution of rainfall of the month shows that it departed very largely from the normal distribution.

The following were the chief features of the actual rainfall of the month :—

1st.—Larger rainfall in Burma, South and East Bengal and Silchar, the amounts ranging from five inches in the coast districts to one and two inches in the interior.

2nd.—Excessive cyclonic rainfall in Orissa.

3rd.—Almost entire absence of rain during the month over nearly the whole of Northern and Central India, the deficiency being most marked in North Bengal and Bihar, where rain was greatly needed for the rice crops.

4th.—Deficient rainfall over nearly the whole of Madras and Mysore, the deficiency being greatest in a belt of country stretching from the Circars into South Mysore.

The following table gives comparative rainfall data for the 52 meteorological districts of India. Plate V gives the data contained in the last figure column of this table. The more complete data of the provincial rainfall statements of the month are utilized when possible in the discussion which follows the table :—

Province.	Division.	Actual average rainfall of Division.					Actual average rainfall during the month.	Normal rainfall of the month.	Variation from normal.
		1st to 7th.	8th to 14th.	15th to 21st.	22nd to 28th.	29th and 30th.			
		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Burma	Tenasserim	1·33	0·08	1·04	1·60	0	4·05	1·20	+ 2·85
	Lower Burma	0·65	0·15	0·80	3·34	0	4·94	2·82	+ 2·12
	Central do.	0·49	0·24	0·25	2·56	0·16	3·70	1·57	+ 2·13
	Upper do.	0·17	0·18	0·17	1·56	0	2·08	?	?
	Arakan	1·19	0·34	0·58	2·90	0	5·01	2·57	+ 2·44

Province.	Division.	Actual average rainfall of Division. 1st to 7th.	8th to 14th.	15th to 21st.	22nd to 28th.	29th and 30th.	Actual average rainfall during the month.	Normal rainfall of the month.	Variation from normal.
		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Bengal and Assam	Eastern Bengal	0·86	0·14	0·10	0·06	0	1·16	0·87	+ 0·29
	Assam (Surma)	2·11	0·24	0	0·45	0·01	2·81	0·63	+ 2·18
	Do. (Brahmaputra)	0·16	0·05	0·06	0·01	0	0·28	0·50	— 0·22
	Deltaic Bengal	0·81	0·14	0	0	0	0·95	0·25	+ 0·70
	Central do.	0·97	0·01	0	0	0	0·98	0·22	+ 0·76
	North do.	0·12	0	0	0	0	0·12	0·13	— 0·01
	Orissa	6·89	0	0	0	0	6·89	1·06	+ 5·83
	Chota Nagpur	0·16	0	0	0	0	0·16	0·25	— 0·09
	Bihar (South)	0	0	0	0	0	0	0·23	— 0·23
	Do. (North)	0	0	0	0	0	0	0·10	— 0·10
North-Western Provinces and Oudh.	North-Western Provinces (East)	0	0	0	0	0	0	0·13	— 0·13
	Oudh (South)	0	0	0	0	0	0	0·02	— 0·02
	Do. (North)	0	0	0	0	0	0	0·05	— 0·05
	North-Western Provinces (Central)	0	0	0	0	0	0	0·04	— 0·04
	Do. do. (West)	0	0	0	0	0	0	0·05	— 0·05
	Do. do. (Submontane)	0	0·01	0·04	0	0	0·05	0·10	— 0·05
Punjab	Punjab (South)	0	0	0	0	0	0	0·08	— 0·08
	Do. (Central)	0	0	0·05	0	0	0·05	0.05	0
	Do. (Submontane)	0	0	0·04	0	0	0·04	0·14	— 0·10
	Do. (Hill Districts)	0	0	0·20	0	0	0·20	0·41	— 0·21
	Do. (North-West)	0·13	0	0·04	0	0	0·17	0·55	— 0·38
	Do. (West)	0	0	0	0	0	0	0·14	— 0·14
Bombay and Malabar Coast Districts (Madras).	Malabar	1·86	1·77	0·24	0·11	0·11	4·09	4·25	— 0·16
	Madras (South Central)	0·64	1·44	0·04	0·04	0·03	2·19	3·51	— 1·32
	Coorg	1·53	0·86	0	0	0	2·39	2·84	— 0·45
	Mysore	0·35	0·20	0	0·01	0·01	0·57	1·90	— 1·33
	Konkan	0·11	0·17	0	0	0	0·28	0·83	— 0·55
	Bombay Deccan	0·01	0·37	0	0	0	0·38	1·19	— 0·81
	Hyderabad (North)	0	0	0	0	0	0	0·91	— 0·91
	Khandeish	0	0	0	0	0	0	0·81	— 0·81
Central Provinces and Berar.	Berar	0	0	0	0	0	0	0·54	— 0·54
	Central Provinces (West)	0	0	0	0	0	0	0·39	— 0·39
	Do. (Central)	0	0	0	0	0	0	0·31	— 0·31
	Do. (East)	0	0	0	0	0	0	0·38	— 0·38
Bombay (North)	Guzerat	0	0	0	0	0	0	0·18	— 0·18
	Kathiawar	0	0	0	0	0	0	0·11	— 0·11
	Sind	0	0	0	0	0	0	0·08	— 0·08
Rajputana and Central India.	Central India (East)	0	0	0	0	0	0	0·23	— 0·23
	Rajputana (East) Central India (West)	0	0	0	0	0	0	0·06	— 0·06
	Rajputana (West)	0	0	0	0	0	0	0·04	— 0·04
Madras	East Coast (North)	0·49	0·09	0	0	0·01	0·59	2·70	— 2·11
	Do. (do.) (a)	0·25	0	0	0	0	0·25	P	P
	Hyderabad (South)	0	0·03	0	0	0	0·03	0·48	— 0·45
	Madras (Central)	0·22	0·39	0	0	0·01	0·62	1·57	— 0·95
	East Coast (Central)	0·07	0·60	0	0	0·03	0·70	6·52	— 5·82
	Do. (South)	2·07	1·48	0·01	0·27	0·32	4·15	7·67	— 3·52
	Madras (South)	2·91	2·78	0·54	0·28	0·12	6·63	5·02	+ 1·61

No rain (*i.e.*, less than an average of a tenth of an inch) fell during the month over a large portion of the interior, including Bihar, Oudh, the North-Western Provinces, the Punjab (except the North-Western and hill districts), Sind, Kathiawar, Rajputana, Central India, Guzerat, Khandeish, Berar, the Central Provinces, and Hyderabad. The normal rainfall in all these provinces is small in amount, varying from three or four hundredth of an inch in Oudh and the North-Western Provinces to eighth-tenths of an inch in Khandeish. The deficiency was of little importance except in Khandeish and Hyderabad.

In the Punjab some light local showers fell on the 17th, 18th and 19th, chiefly in the northern and hill districts, but the amounts were in all cases small, not exceeding two or three tenths of an inch.

A large portion of Bengal received moderate to excessive rainfall from the 4th to 7th during the advance of the cyclonic storm of the first week of the month over the north of the Bay and Bengal. The rainfall was excessive in Orissa. The following gives the more remarkable rainfalls:—

District.	Station.	Rainfall of 5th.	6th.	Total rainfall during storm.
		Inches.	Inches.	Inches.
Puri	Puri	13·61	1·80	15·91
	Gop	5·00	14·00	19·70
Cuttack	Kendrapara	6·21	9·50	16·12
	Jagatsingpore	4·80	6·30	12·47
Balasore	Chandbali	2·26	7·92	10·53

The rainfall was of the same torrential character in the part of the Bay crossed by the cyclone as in Orissa. The storm rapidly recurved off the Orissa Coast and in the north-west angle of the Bay from north to east-north-east, and this was followed by a large and rapid diminution of rainfall in the storm area. The rainfall data of the stations given above afford an approximate estimate of the rainfall in the track or area covered by the inner storm area in the Bay before approaching the Bengal coast. South-west Bengal received moderate rain from the 5th to the 7th, and Eastern Bengal moderate to heavy rain from the 4th to the 7th. Heavy rain was received in the Jessore, Dacca, Comilla and Faridpur districts through which the storm passed when it was breaking up on the evening of the 6th. The districts of Pabna, Bogra, Rajshahi, and Malda in North Bengal received light to moderate rain during the storm, but over the remainder of Northern Bengal and in Bihar no rain fell.

The eastern districts of South-West Bengal and East Bengal received light local showers on the 12th, 13th and 15th, and East Bengal a few local showers on the 27th.

The rainfall of the month was largely in excess in Orissa and in slight excess in Eastern, Central and Deltaic Bengal. The only districts in these divisions of Bengal in which it was considerably in excess, were the following, for which data are given :—

Station.	Rainfall.		
	Average fall of month.	Normal.	Variation.
	Inches.	Inches.	Inches.
Khulna	3·15	0·49	+2·66
Tipperah	4·06	0·69	+3·37
Mymensingh	1·65	0·31	+1·34
Bogra	2·09	0·35	+1·74
Faridpur	1·89	0·39	+1·50
Dacca	2·45	0·77	+1·68

Over the greater part of North Bengal and in Bihar no rain fell, and in Chota Nagpur an average of little more than a tenth of an inch was received.

The following table gives average rainfall data for the eight meteorological districts into which the province is divided, based on the rainfall statement of the month published in the *Calcutta Gazette*. The actual for Eastern Bengal differs considerably from that in the preceding table, due to the inclusion of the more remote stations at several of which moderately heavy rain was received.

District.	Rainfall.		Number of rainy days.	
	Actual.	Normal.	Actual.	Normal.
	Inches.	Inches.		
Eastern Bengal	2·18	0·87	3·10	1·35
Deltaic "	0·98	0·25	1·52	0·99
Central "	1·02	0·22	1·56	0·13
North "	0·11	0·13	0·45	0·41
Orissa	6·52	1·06	2·59	2·12
Chota Nagpur	0·35	0·25	0·70	0·90
North Bihar	*Nil*	0·10	*Nil*	0·25
South Bihar	0·09	0·23	0·20	0·43

Assam obtained daily showers from the 1st to the 7th, but the amounts registered were generally small. Some heavy downpours were received in Sylhet on the 4th, the most remarkable being a fall of 10·64 inches at Karimganj. It was greater than usual in the Garo and Khasi hills. Thus Cherra Poonji received a total of 4·28 inches, and Jowai of 3·29 inches, the average rainfalls of the month at these two stations being 1·65 inches and 1·39 inches, respectively.

The rainfall was generally deficient and was irregularly distributed in the Brahmaputra valley. It was most deficient in the Kamrup, Nowgong and Sibsagar districts, in which rainfalls less than a tenth of an inch were recorded at many stations. The average rainfall of the remaining districts varied by small amounts from the normal.

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

District.	Rainfall.		Number of rainy days.	
	Average actual.	Average normal.	Average actual.	Average normal.
	Inches.	Inches.		
Assam (Surma)	2·81	0·63	3·0	1·5
Assam Hill Districts	2·26	0·98	3·0	1·8
Brahmaputra	0·28	0·50	1·4	1·2

There were three periods of rainfall in the Madras Presidency.

The first period was from the 1st to the 3rd. The districts included in Madras East Coast South, and Madras South obtained general and fairly heavy rain during this period. Moderate showers fell in Madras South Central (or in the Coimbatore and Salem districts). No rain fell in the east coast districts north of Madras, or in the Deccan districts during this period.

The district of Ganjam had moderate rain on the 4th and 5th during the advance of the Port Blair cyclone to the east of that coast district.

The second period of fairly general rainfall extended from the 6th to the 11th or 12th. This was the most important burst of rain during the month. The east districts south of Nellore, and the southern districts obtained moderately heavy rain during this period and the northern coast and central districts light and scattered rain.

The last rainfall period of the month extended from the 27th to the 30th. During this period light rain was received in the coast districts, south of Nellore. No rain fell in the central or northern districts.

The following gives a full statement of the rainfall data of the month :—

Division.	District.	Rainfall.		Number of rainy days.	
		Average actual.	Average normal.	Average actual.	Average normal.
		Inches.	Inches.		
East Coast, North.	Ganjam	1·12	3·37	0·7	3·3
	Vizagapatam	0·52	3·20	0·8	4·3
	Godavari	0·16	3·17	0·3	3·2
	Kistna	0·18	3·15	0·2	3·3

Division.	District.	Rainfall.		Number of rainy days.	
		Average actual.	Average normal.	Average actual.	Average normal.
		Inches.	Inches.		
East Coast, Central.	Nellore	1·46	8·58	2·9	7·6
East Coast, South	Chingleput	4·76	11·46	7·2	9·9
	North Arcot	2·89	8·01	4·6	7·5
	South Arcot	4·41	8·68	6·7	9·1
	Tanjore	6·11	9·83	7·6	10·8
	Trichinopoly	2·46	4·53	5·5	7·1
Madras, South	Madura	5·39	5·53	6·6	7·7
	Tinnevelly	8·55	7·52	8·7	9·6
Malabar Coast	Malabar	3·65	4·61	4·9	6·5
	South Canara	2·03	3·07	3·5	4·3
Madras South, Central.	Salem	1·41	3·80	3·3	5·8
	Coimbatore	1·94	3·64	3·7	5·9
Madras Hills	Nilgiris	3·47	5·62	6·2	8·6
Madras, Central	Cuddapah	0·61	4·08	1·1	4·7
	Anantpur	0·95	2·11	1·9	3·1
	Bellary	0·57	1·30	1·1	2·3
	Kurnool	0·24	1·69	0·7	3·0

The statement shows that the rainfall was considerably below the normal in all districts except Tinnevelly and Madura. It was slightly in excess in Tinnevelly and normal in amount in Madura.

The deficiency was on the whole small in amount in the district of Malabar, and was moderately large in Trichinopoly, Tanjore, South Arcot, Coimbatore and the Nilgiris.

It was very large (relatively to the normal) in the remaining districts. The drought was most pronounced in the districts of Vizagapatam, Godavari and Kistna. Fifteen out of 21 rainfall-reporting stations in Godavari and 10 out of 13 in Kistna had no rain during the month. The drought was almost as severe in the Nellore, Chingleput, North Arcot, Cuddapah, Bellary and Kurnool districts. Seven out of 12 rainfall stations in the Kurnool district received total amounts of a tenth of an inch or less.

The deficiency was also serious in the districts of Salem, in which the rainfall of the months of June, July and August had been very scanty.

The month was abnormally dry in Mysore. Light to moderate local showers were received from the 5th to the 9th or 10th, after which practically no rain fell during the month. The following data show fully the extent of the deficiency in that state:—

District.	Rainfall.		Number of rainy days.	
	Average actual.	Average normal.	Average actual.	Average normal.
	Inches.	Inches.		
Bangalore	0·28	2·53	1·2	3·4
Kolar	0·65	2·98	2·0	4·3
Tumkur	0·74	2·35	1·5	2·9
Mysore	0·27	2·75	1·1	4·8
Shimoga	0·54	1·79	0·7	3·0
Kadur	0·75	2·61	1·7	3·8
Hassan	1·21	2·93	2·5	4·7
Chittaldroog	0·94	2·41	1·5	2·8

The preceding data show that the Mysore State received barely one-quarter of its normal amount. The deficiency was least marked in the northern districts of Hassan and Chittaldroog, and was greatest in the districts of Bangalore and Mysore, which barely received a tenth of their normal amount. This, it may be observed, was due less to the smaller number of rainy days (one-third to one-quarter the normal number) than to the unusual lightness of the showers.

Burma received light to moderate rain during the existence of the first storm of the month. Occasional showers fell in all districts during the second and third weeks of the month. Moderate to heavy rain fell over the whole province on the 23rd, 24th and 25th, due to the second cyclonic storm of the month. This rainfall was heaviest in the districts of Prome, Henzada and Yamethin.

The following gives the more noteworthy rainfalls of this period:—

District.	Station.	Date.	Heaviest falls of rain, exceeding three inches.
			Inches.
Thongwa	Maubin	22nd	3·23
	Wakema	"	3·39
	Dedaye	"	3·11
Bassein	Labutta	"	3·40
Henzada	Kyangin	23rd	7·96
Yamethin	Yamethin	"	3·45
Amherst	Thaton	24th	4·55
Pegu	Kyauktan	"	4·36
Henzada	Kanaung	"	5·69
	Myanaung	"	10·88
Prome	Prome	"	3·90
	Shwedaung	"	4·08
	Paungde	"	8·95
Thayetmyo	Thayetmyo	"	3·32
	Kama	"	3·96
	Myede	"	3·25
Sandoway	Sandoway	"	3·94

The rainfall of the month was largely in excess in all districts. The following gives a summary of the rainfall data of the month:—

District.	Rainfall.		Number of rainy days.	
	Average actual.	Average normal.	Average actual.	Average normal.
	Inches.	Inches.		
Tenasserim	4·05	1·20	4·3	?
Lower Burma	4·94	2·82	6·4	?
Central Burma	3·70	1·57	5·0	?
Upper Burma	2·08	?	3·7	?
Arakan	5·01	2·57	6·7	?

Explanation of Tables.

Table I gives an abstract of the meteorological observations at 8 A.M. daily, taken at 161 stations in India during the month of November 1891.

In this table the observing stations are grouped under two sets of divisions. According to the first arrangement, India and Burma are divided into eleven large meteorological areas or provinces. These divisions have been selected in consultation with the Medical Department. The climatic conditions of each area are fairly uniform, and they, hence, are presumed to form suitable areas for the discussion of the relations between disease and meteorology. The names of these divisions are printed in bold type, and the mean variations of the more important meteorological data, more especially temperature, are given opposite to each in prominent figures.

Each of these larger divisions is subdivided into smaller meteorological areas or districts, of which there are 51 in all. This subdivision was made in consultation with the Revenue and Financial Departments. In each of these smaller areas the distribution and character of the rainfall are fairly uniform, and the staple crops in each are hence the same. This subdivision will, it is hoped, enable a more exact comparison to be made between crops and rainfall than has been hitherto possible.

The headings of the columns in the great majority of cases explain themselves. The figures in the third column "variation from normal" are obtained by taking in each case the difference between the mean actual barometer (reduced for temperature, but not to sea-level or constant gravity) and the normal means obtained from the observations of the eleven years' period, 1878-88.

The "mean daily temperature" is assumed in Table I to be the mean of the maximum and minimum. It is chiefly utilized in order to obtain the mean variation of the temperature of the month from the normal.

In obtaining the figures for the column headed "Number of rainy days," a rainy day is assumed to be one on which a fall of a tenth of an inch or upwards has been recorded. A fall of less than a tenth of an inch is practically of no value for agricultural purposes in India, and it has not been found possible to secure the accurate record of rainfalls of less than a tenth of an inch at a great majority of the rainfall-recording stations.

Table II gives an abstract of the observations recorded at 10 A.M. and 4 P.M. at 89 second-class observatories throughout India, Burma and the adjacent regions. This table is intended in part to supplement Table I, and hence information given in full in the latter table, as, for example, rainfall, is not included in Table II. This table is intended to give for the month, so far as is possible, all the information furnished hitherto in the Appendix A of the Annual Report on the Meteorology of India. The methods of calculating the means have been very fully explained in the Annual Reports, to which the reader is referred for complete information. The data of the mean daily pressure, the figures of which are given in the sixth column, are the means of the 10 and 16 hours' observations, with corrections obtained from a comparison of the 10 and 16 hours' observations at the same or a neighbouring observatory, with a series of hourly observations at the same observatory.

The mean temperature is calculated by the formula, $\text{mean} = \frac{\textit{maximum} + \textit{16 hours} + \textit{2 minimum}}{4}$ by applying a constant correction for each month, derived from the hourly observations of the same or of a neighbouring station.

The mean daily vapour tension and humidity are the averages of the values for 10 A.M., 4 P.M. and the minimum readings, and the mean daily cloud is the average of the mean amounts for 10 and 16 hours.

The mean wind direction for each month is the trigonometrical resultant of the winds given under each of the eight cardinal points, and is calculated by means of Lambert's formula, in which an equal weight or value is given to every wind.

It should be noted that in the preceding discussion, in speaking of the maximum, minimum, or mean temperature, the total amount of wind or the rainfall of a given day, as, for example, the 5th, the maximum, etc., of the 24 hours preceding 8 A.M. of the 5th is meant. This definition has been adopted to avoid confusion. As the observations are taken at 8 A.M. a part of them refer to 8 A.M. of that day and a part to the previous twenty-four hours, and, therefore, including a portion of the previous civil day. It is found most convenient to use the same date to designate and define both classes of observations.

Table

Abstract of Observations taken at 8 A.M., at 161 Stations

Meteorological Province or District.	Station.	Height of Station 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.
Burma Coast and Bay Islands.		...	...	—·002	...	...	...	...	...	...	...	86·2	—1·0	72·1	+0·2	79·1	—0·4	14·4	...	...	...	...	...
Bay Islands	Port Blair	61·16	29·860	?	29·852	29·965	27th	29·722	2nd	·243	81·1	85·8	?	77·0	?	81·4	?	8·8	90·1	10th	70·0	2nd	20·1
Tenasserim	Mergui	96·27	29·873	?	29·901	29·971	27th	29·823	14th	·148	77·2	87·4	?	66·7	?	77·1	?	20·7	90·0	3rd	59·4	13th	30·6
	Tavoy	26·26	29·949	?	29·908	30·050	27th	29·905	14th	·145	77·6	88·0	?	71·2	?	79·6	?	16·8	90·2	8 days	64·7	13th	25·5
	Moulmein	93·7/9	29·888	+·005	29·922	30·006	27th	29·829	23rd	·177	77·6	88·1	—0·3	73·5	+2·4	80·8	+1·1	14·6	96·5	9th	68·8	30th	27·7
	Toungoo	181·1	29·797	+·003	29·924	29·926	27th	29·736	13th	·190	74·5	85·3	—1·3	70·5	+0·2	78·2	—0·6	15·3	91·7	3rd	65·7	28th & 30th.	26·0
Lower Burma	Rangoon	40·69	29·934	—·004	29·913	30·062	27th	29·808	23rd	·254	76·3	?	?	73·1	0	?	?	16·2	?	?	68·8	3 days	23·4
	Bassein	21	29·950	+·003	29·909	30·075	27th	29·775	23rd	·300	75·5	84·8	—1·2	71·8	0	78·3	—0·6	13·0	89·7	1st	67·9	25th & 30th.	21·8
	Diamond Island	41	29·918	—·012	29·896	30·037	27th	29·743	23rd	·294	79·3	85·2	—0·6	71·4	—3·6	78·3	—2·1	13·8	89·8	9th	67·6	25th & 26th.	22·2
Arakan	Akyab	20·44	29·960	—·005	29·925	30·096	27th	29·819	23rd	·277	74·6	84·2	—1·7	73·9	+2·1	79·2	+0·2	10·3	90·2	2nd	68·1	29th	22·1
Burma, Inland		...	...	+·011	...	...	...	...	...	...	...	85·1	+0·5	65·0	—2·3	75·0	—0·9	20·1	...	...	...	...	...
Central Burma	Thayetmyo	134	29·858	+·011	29·937	29·989	27th	29·778	14th	·211	75·5	88·1	+0·5	66·1	—2·3	77·0	—0·9	22·0	94·2	2nd	57·8	25th	36·4
Upper Burma	Mandalay	?	29·767	?	29·713	29·917	28th	29·661	14th	·256	73·4	87·6	?	70·4	?	79·0	?	17·2	95·0	2nd	64·3	28th	30·7
	Kindat	?	29·634	?	29·582	29·727	27th	29·508	14th	·219	70·5	83·6	?	64·1	?	73·8	?	19·5	88·3	2nd	61·0	3 days	27·3
	Bhamo	?	29·630	?	29·580	29·788	27th	29·499	14th	·289	65·4	80·9	?	59·4	?	70·2	?	21·5	86·5	1st	51·2	3 days	35·3
Assam		...	...	—·002	...	...	...	...	...	...	...	81·9	+0·9	61·5	—0·8	71·7	0	20·4	...	...	...	...	...
Assam (Surma)	Silchar	104·3	29·907	+·005	29·965	30·073	28th	29·785	7th	·288	70·0	86·7	+2·1	62·8	—0·9	74·8	+0·6	23·9	92·5	3rd	57·4	27th	35·1
Brahmaputra	Sibsagar	333	29·714	—·008	30·018	29·845	30th	29·597	7th	·248	61·0	78·5	0	59·0	—0·7	68·7	—0·4	19·5	82·1	2nd	52·2	30th	29·9
	Dhubri	115·34	29·913	—·004	29·987	30·055	30th	29·786	6th	·269	66·8	80·5	+0·5	62·8	—0·7	71·7	—0·1	17·7	85·2	13th	58·7	30th	26·5
Bengal and Orissa		...	...	—·010	...	...	...	...	...	...		83·0	+0·9	64·4	+0·7	73·7	+0·8	18·6	...	...	...	...	...
East Bengal	Chittagong	86·7	29·901	—·006	29·938	30·043	27th	29·784	6th	·259	73·4	85·0*	+2·2*	67·0*	+0·8*	76·0*	+1·5*	18·0	90·7	2nd	63·1	29th & 30th.	27·6
	Lungleh	?	?	?	?	?	?	?	?	?	62·3	63·9	?	59·7	?	61·8	?	4·2	68·9	5 dates	54·4	30th	14·5
	Noakhali	42·73	29·949	?	29·940	30·097	27th	29·832	6th	·265	73·2	84·2	?	65·5	?	74·9	?	18·7	89·5	3rd	60·0	21st & 30th.	29·5
	Comilla	34·75	29·966	?	29·950	30·101	27th	29·856	23rd	·245	71·9	84·1	?	65·8	?	75·0	?	18·3	88·4	3rd	59·9	21st	28·5
	Sirajganj	46·37	29·955	?	29·952	30·093	28th	29·844	6th	·249	69·1	83·2	?	62·8	?	73·0	?	20·4	87·6	5th	56·9	30th	30·7
	Dacca	21·7	29·974	—·004	29·944	30·109	27th	29·847	6th	·262	71·6	84·8	+1·0	65·6	—0·4	75·2	+0·3	19·2	90·6	4th	61·8	30th	28·8
	Bárisal	12	29·975	+·007	29·932	30·118	30th	29·827	6th	·291	74·1	83·4	+1·8	66·6	+1·6	75·0	+1·7	16·8	87·8	3rd & 28th.	61·6	18th	26·2
	Mymensingh	55·18	29·953	—·013	29·963	30·092	30th	29·844	6th	·248	69·8	82·7	0	64·2	+1·0	73·5	+0·5	18·5	87·2	3rd & 4th.	59·2	30th	28·0
Deltaic Bengal	Faridpur	39	29·969	?	29·957	30·104	30th	29·839	6th	·265	72·2	83·0	?	65·6	?	74·3	?	17·4	88·0	26th	60·0	18th	29·0
	Jessore	33·29	29·967	—·010	29·948	30·107	30th	29·803	6th	·304	71·1	83·8	+0·2	65·0	+1·0	74·4	+0·6	18·8	88·7	3rd & 4th.	60·0	30th	28·7
	Calcutta	21·38	29·983	—·015	29·950	30·131	30th	29·754	6th	·377	71·2	83·0	+1·3	65·2	+0·5	74·2	+0·9	17·8	86·6	3rd & 4th.	60·2	19th & 20th.	26·4
	Saugor Island	25·3	29·963	—·025	29·933	30·104	30th	29·679	6th	·425	72·7	82·3	+0·7	67·0	0	74·7	+0·4	15·3	87·2	4th	63·9	27th & 28th.	23·3
	Krishnagar	46·64	29·958	?	29·955	30·098	30th	29·797	6th	·301	70·9	84·4	?	63·9	?	74·2	?	20·5	89·3	3rd	58·4	20th	30·9
	Midnapore	148·88	29·853	?	29·953	29·997	30th	29·662	6th	·335	69·9	84·9	?	64·0	?	74·5	?	20·9	88·3	3rd & 9th,	59·2	18th	29·1
Central Bengal	Bankura	300	29·687	?	29·948	29·822	30th	29·533	6th	·289	69·3	83·9	?	63·5	?	73·7	?	20·4	86·8	14th	59·0	25th & 26th.	27·8
	Raniganj	345·15	29·678	?	29·985	29·806	27th	29·537	6th	·269	68·3	84·8	?	62·7	?	73·7	?	22·1	93·0	5th	57·9	25th	35·1
	Burdwan	99·09	29·926	—·002	29·974	30·058	30th	29·758	6th	·300	71·4	84·8	+2·1	64·2	+0·8	74·5	+1·2	20·6	89·6	3rd	60·4	26th & 27th.	29·2

* Mean of 29 days.

I.

in India, Burma, &c., in November 1891.

Wind Direction, Number of Winds from: Calm.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	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 1891.	Normal rainfall for period, 1st October to 30th November.	Variation from normal of period.	Station.	Meteorological Province or District.
...	...	...	...	...	...	...	...	..	...	...	..	...	...	...	...	...	...	6·82	4·82	+1·99	...	...	...	**Burma Coast and Bay Islands.**	
3	3	3	2	5	4	2	3	3	10*	7	+43	86	·912	6·2	16	...	...	12·89	8·97	+ 3·92	18·54	21·14	— 2·60	Port Blair(a)	Bay Islands.
...	5	7	6	7	1	2	...	2	2	2	0	83	·778	5·4	9	...	...	5·35	3·63	+ 1·72	21·00	17·17	+ 3·83	Mergui .	Tenasserim.
26	...	1	1	...	1	...	...	1	1	?	?	84	·800	1·9	5	...	...	2·16	2·33	— 0·17	7·34	12·84	— 5·50	Tavoy.	
...	7	9	4	3	...	...	2	5	3	2	+50	83	·794	2·2	4	...	...	4·59	2·56	+ 2·03	8·81	10·84	— 2·03	Moulmein.	
8	11	1	1	1	...	...	1	7	2	2	0	90	·778	6·0	5	...	...	3·28	1·25	+ 2·03	6·85	8·26	— 1·41	Toungoo.	
...	1	8	15	4	...	2	...	...	3	4	—25	89	·813	4·2	4	...	...	4·41	3·09	+ 1·32	6·04	10·18	— 4·14	Rangoon .	Lower Burma.
3	1	10	10	2	1	...	...	3	5	3	+67	88	·785	5·2	8	...	...	8·40	4·88	+ 3·52	13·69	13·09	+ 0·60	Bassein.	
1	1	10	12	3	...	1	1	1	11	9	+22	81	·818	5·5	10	...	...	15·56	13·78	+ 1·78	18·78	22·70	— 3·92	Diamond Island.	
...	9	16	3		1	...	...	...	3	2	+50	89	·762	4·7	7	...	...	4·71	2·93	+ 1·78	13·39	12·96	+ 0·43	Akyab .	Arakan.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2·03	1·80	+0·23	...	...	...	**Burma, Inland.**	
...	20	2	2	...	1	1	...	4	5	4	+25	80	·695	4·9	4	...	...	4·23	2·40	+ 1·83	4·64	6·87	— 2·23	Thayetmyo	Central Burma.
6	3	2	...	3	3	1	...	12	?	?	?	81	·663	5·4	4	...	...	1·69	1·16	+ 0·53	4·89	4·01	+ 0·88	Mandalay .	Upper Burma.
24	1	1	...	...	...	...	1	...	2	?	?	93	·699	1·0	4	...	...	0·90	2·91	— 2·01	6·07	8·90	— 2·83	Kindat.	
...	...	21	...	...	...	...	...	9	?	?	?	89	·557	5·	3	...	...	1·31	0·74	+ 0·57	3·21	5·19	— 1·98	Bhamo.	
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1·08	0·73	+0·36	...	...	...	**Assam.**	
29	...	...	1	...	...	...	...	...	0	2	0	83	·613	3·9	4	...	...	2·08	1·25	+ 0·83	6·29	6·12	+ 0·17	Silchar .	Assam (Surma)
2	...	12	12	...	1	2	...	1	2	2	0	99	·568	5·9		...	...	1·10	0·66	+ 0·44	5·58	5·83	— 0·25	Sibsagar .	Brahmaputra.
...	1	17	12	...	...	...	...	...	8	5	+60	86	·566	2·1	0	...	...	0·07	0·27	— 0·20	1·27	3·70	— 2·43	Dhubri.	
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2·57	0·80	+1·60	...	...	...	**Bengal and Orissa.**	
13	3	9	5	...	...	...	...	...	2	3	—33	89	·734	4·6	4	...	...	1·07	1·70	— 0·63	2·84	6·73	— 3·89	Chittagong	East Bengal.
...	...	...	...	...	...	...	...	...	?	?	?	91	·515	?	8	...	..	3·15	?	?	11·40	?	?	Lungleh.	
3	14	6	5	1	...	...	...	1	3	?	?	85	?	0·5	2	...	...	0·86	1·81	— 0·95	3·82	9·47	— 5·65	Noakhali.	
7	8	14	...	1	...	...	...	...	1	?	?	85	?	2·5	2	...	..	4·62	1·30	+ 3·32	7·01	6·60	+ 0·41	Comilla.	
...	7	12	7	2	...	1	...	1	2	?	?	91	?	2·3	2	...	..	1·06	?	?	4·58	?	?	Sirajganj.	
2	10	10	1	...	1	1	1	4	4	2	+100	85	·658	3·1	3	...	..	1·79	0·32	+ 1·47	1·87	5·03	— 3·16	Dacca.	
12	5	10	1	...	...	...	...	2	2	?	?	82	·693	2·0	3	...	...	2·06	1·06	+ 1·00	2·57	6·39	— 3·82	Bárisal.	
4	2	10	10	2	1	1	...	...	2	?	?	88	·641	2·3	3	...	...	2·38	0·30	+ 2·08	5·87	6·18	— 0·31	Mymensingh.	
13	7	6	2	1	...	...	...	1	2	?	?	86	?	2·0	2	...	...	1·13	0·78	+ 0·35	2·63	5·09	— 2·46	Faridpur .	Deltaic Bengal .
13	5	5	...	1	1	...	...	5	2	2	0	85	·652	2·9	4	...	...	1·37	0·53	+ 0·84	1·47	4·28	— 2·81	Jessore.	
1	12	6	4	...	1	1	...	5	3	3	0	79	·605	2·0	1	...	...	0·51	0·51	0	0·61	4·30	— 3·69	Calcutta.	
...	13	9	2	...	...	1	1	4	10	6	+67	87	·700	4·0	1	...	...	4·29	0·97	+ 3·32	4·50	8·93	— 4·43	Saugor Island.	
1	9	5	3	1	1	...	2	8	4	?	?	80	?	2·2	1	...	...	1·30	0·72	+ 0·58	2·41	5·26	— 2·85	Krishnagar.	
...	21	3	...	...	...	1	...	5	11	?	?	73	?	1·9	1	...	...	0·18	0·49	— 0·31	0·76	5·30	— 4·54	Midnapore.	
9	6	1	...	...	...	...	4	10	2	?	?	74	?	1·7	2	...	...	0·69	0·55	+ 0·14	1·83	5·03	— 3·20	Bankura .	Central Bengal.
...	7	4	1	...	...	1	3	14	3	?	?	74	?	1·3	1	...	...	0·28	?	?	2·13	?	?	Raniganj.	
5	19	1	3	...	...	...	...	2	2	2	0	68	·566	2·5	1	...	...	0·25	0·68	— 0·43	0·73	3·99	— 3·26	Burdwan.	

(a) Wind observations for 28 days.

* Mean of 26 days.

Table

Abstract of Observations taken at 8 A.M., at 161 Stations

Meteorological Province or District.	Station.	Height of Station 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.
Central Bengal —*concld.*	Naya Dumka	490	29·517	?	29·982	29·644	30th	29·400	6th	·244	69·5	83·5	?	61·9	?	72·7	?	21·6	88·1	5th	57·5	25th	30·6
	Berhampore	66·45	29·947	—·014	29·964	30·062	30th	29·812	6th	·270	68·6	82·8	+0·9	65·2	+1·3	74·0	+1·1	17·6	88·1	5th	61·2	30th	26·9
	Rampur Boalia.	70	29·937	?	29·958	30·068	30th	29·826	6th	·242	69·2	82·2	?	63·4	?	72·8	?	18·8	87·3	5th	58·9	25th	28·4
	Malda	80	29·943	?	29·978	30·093	30th	29·836	6th	·257	69·3	84·9	?	60·9	?	72·9	?	24·0	88·8	3rd & 5th.	56·2	30th	32·6
	Bogra	61·48	29·912	+·001	29·927	29·998	1st	29·836	7th	·162	68·9	83·1	+0·6	63·1	+1·3	73·1	+1·0	20·0	88·3	5th	59·2	20th & 25th.	29·1
North Bengal	Dinajpur	117·59	29·899	—·007	29·974	30·031	30th	29·807	7th	·224	69·2	84·3	+2·1	59·9	+0·5	72·1	+1·3	24·4	87·1	3 days	54·9	20th	32·2
	Rangpur	123	29·909	?	29·991	30·045	27th & 30th	29·801	7th	·244	67·9	83·1	?	60·9	?	72·1	?	22·2	86·8	1st	55·8	29th	31·0
	Jalpaiguri	283·7	29·742	+·013	29·990	29·869	27th & 30th	29·636	14th	·233	67·5	82·7	+1·1	58·8	—0·3	70·8	+0·4	23·9	86·4	3rd	52·1	28th	34·3
Orissa	Balasore	53·98	29·943	—·022	29·947	30·085	30th	29·741	5th	·344	69·2	83·8	+1·1	63·3	+1·4	73·6	+1·3	20·5	87·4	3 days	58·6	3 days	28·8
	False Point	20·60	29·965	—·029	29·928	30·107	30th	29·608	5th	·499	71·7	80·6	—1·4	67·7	+1·9	74·0	+0·3	12·9	86·4	1st	63·0	19th	23·4
	Cuttack	80	29·915	—·017	29·940	30·050	30th	29·545	5th	·505	71·6	85·0	—0·2	65·6	—0·6	75·3	—0·4	19·4	88·4	1st	60·8	19th & 20th.	27·6
	Short's Island	?	29·962	?	?	30·099	30th	29·711	5th	·388	77·2	81·4	?	73·6	?	77·5	?	7·8	85·2	1st	69·6	25th	15·6
	Puri*	11·99	29·978	?	29·927	30·105	30th	29·783	4th	·322	72·6	85·4	?	68·3	?	76·9	?	17·1	89·2	1st & 2nd.	64·6	19th	24·6
Gangetic Plain and Chota-Nagpur.		...	...	—·002	...	...	...	...	...	...	...	83·2	+1·4	58·4	+0·9	70·9	+1·2	24·6	...	...	...	...	...
Chota-Nagpur	Hazaribagh	2,007·12	27·987	—·003	29·988	28·106	30th	27·874	6th	·232	67·1	78·7	+2·0	59·0	+2·0	68·9	+2·0	19·7	82·7	5th	52·9	22nd	29·8
	Ranchi	2,128·14	27·854	?	29·972	27·964	30th	27·737	6th	·227	66·7	77·4	?	57·8	?	67·6	?	19·6	81·0	9th	54·5	26th	26·5
	Chaibassa	760	29·231	—·001	29·960	29·364	30th	29·066	5th	·298	69·1	82·8	+0·1	61·0	+1·9	71·9	+1·0	21·8	85·5	3 days	55·8	27th	29·7
Bihar, South	Gaya	374·5	29·664	+·006	30·008	29·801	30th	29·559	6th	·242	67·7	84·0	+1·7	61·1	+2·1	72·6	+1·9	22·9	86·9	8th	56·8	27th	30·1
	Dehri	351·14	29·695	?	30·013	29·833	30th	29·574	6th	·259	68·4	84·3	?	59·5	?	71·9	?	24·8	87·3	1st	54·5	22nd	32·8
	Patna	182·84	29·860	—·007	30·002	29·993	30th	29·753	6th	·240	70·0	83·8	+2·4	61·9	+2·1	72·8	+2·3	21·9	87·9	4th	55·6	25th	32·3
	Arrah	190·02	29·844	?	29·993	29·974	30th	29·742	6th	·232	67·3	85·5	?	63·0	?	74·2	?	22·5	88·4	4th	59·3	9th	29·1
	Buxar	239·22	29·801	?	30·004	29·941	30th	29·691	6th	·250	69·1	84·6	?	60·1	?	72·3	?	24·5	87·4	2nd	53·9	22nd	33·5
Bihar, North	Purnea	125	29·905	+·005	29·990	30·028	30th	29·796	6th	·232	63·9	84·3	+2·3	55·9	—2·9	70·1	—0·3	28·4	86·2	7 days	49·3	24th	36·9
	Bhagalpur	159·78	29·865	?	29·983	30·001	30th	29·757	6th	·244	69·1	84·1	?	60·7	?	72·4	?	23·4	86·7	2nd & 9th.	53·0	25th	33·7
	Darbhanga	166·32	29·878	+·005	30·004	30·014	30th	29·773	14th	·241	66·9	84·0	+3·4	60·0	—2·2	72·0	+0·6	24·0	86·9	2nd & 4th.	55·5	3 days	31·4
	Muzaffarpur‡	178·42	29·939	?	30·081	29·978	30th	29·788	23rd	·190	60·5	?	?	53·7	?	?	?	?	?	?	51·8	25th	·?
	Motihari	223·61	29·796	?	29·987	29·925	30th	29·686	14th	·239	65·2	84·2	?	55·1	?	69·6	?	29·1	87·2	3rd & 4th.	47·9	26th	39·3
	Chapra	181·3	29·851	?	29·993	29·988	30th	29·749	6th	·239	67·4	84·7	?	59·7	?	72·2	?	25·0	87·8	4th	55·1	27th28th & 29th.	32·7
N.-W. Provinces (Eastern District.)	Benares	256·97	29·772	—·002	30·009	29·914	30th	29·669	6th	·245	63·8	83·2	+0·7	55·9	+0·5	69·6	+0·6	27·3	86·7	7th	51·0	22nd	35·7
	Allahabad	309·28	29·727	—·007	30·006	29·862	30th	29·629	6th	·233	65·8	84·1	+1·9	56·0	+1·6	70·1	+1·8	28·1	88·5	16th	50·9	26th	37·6
N.-W. Provinces (East Submontane).	Gorakhpur	255·93	29·766	—·009	29·992	29·909	30th	29·660	14th	·249	66·4	81·8	—0·2	58·9	+1·6	70·4	+0·7	22·9	85·4	3 days.	53·3	25th & 26th.	32·1
Oudh, South	Lucknow	369·4	29·664	—·005	30·011	29·811	30th	29·561	14th	·250	64·1	83·3	+0·1	53·7	+2·2	68·6	+1·2	29·6	86·8	5th	49·0	25th & 26th.	37·8
N.-W. Provinces (Central).	Cawnpore	415·57	29·618	?	30·011	29·760	30th	29·509	14th	·251	66·3	82·8	?	55·8†	?	69·3†	?	27·0	86·0	4 days	49·5	25th & 26th.	36·5
Upper—Sub-Himalayas		...	...	+·001	...	...	...	...	...	...	...	80·7	+0·1	52·4	+3·2	66·6	+1·7	28·3	...	...	...	...	...
N.-W. Provinces (Sub-montane).	Bareilly	568·47	29·442	—·003	30·005	29·593	30th	29·338	14th	·255	61·0	80·6	—0·7	54·7	+2·6	67·7	+1·0	25·9	84·3	4th & 5th.	49·7	25th & 26th.	34·6
	Dehra Dun	2,232·4	27·775	?	30·055	27·925	30th	27·662	14th	·263	57·8	76·9	?	52·9	?	64·9	?	24·0	80·0	5th & 12th.	47·5	26th, & 27th.	32·5
	Roorkee	886·63	29·129	+·006	30·039	29·284	30th	29·009	14th	·275	56·9	81·2	+0·5	52·5	+3·4	68·9	+2·0	28·7	85·3	12th	47·2	25th	38·1
	Meerut	737·48	29·278	+·003	30·027	29·448	30th	29·144	14th	·304	57·4	80·8	—0·7	52·5	+3·1	66·7	+1·2	28·3	84·2	3 days	48·6	22nd & 26th.	35·6
Punjab, Central.	Delhi	717·81	29·305	+·005	30·024	29·442	30th	29·177	14th	·265	62·1	80·3	—3·4	58·2	+3·1	69·3	—0·2	22·1	84·6	2nd	53·1	26th	31·5
	Lahore	702·2	29·312	0	30·027	29·463	30th	29·198	13th & 14th	·265	59·6	83·1	+1·1	50·8	+3·2	67·0	+2·2	32·3	87·3	8 days	43·6	24th	43·7

* Observations of 25 days. † Mean of 29 days. ‡ Observations of 16 days, from 15th to 30th.

I—*continued.*

in India, Burma, &c., in November 1891—continued.

Wind Direction. Number of Winds from: Calm.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	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 1891.	Normal rainfall for period, 1st October to 30th November.	Variation from normal of period.	Station.	Meteorological Province or District.
11	2	2	5	...	...	...	...	10	2	?	?	72	?	0·9	1	...	...	0·36	0·36	0	0·70	4·27	− 3·57	Naya Dumka	Central Bengal.—*concld.*
4	16	...	4	...	...	...	3	3	2	2	0	88	·622	2·4	2	...	...	1·06	0·51	+ 0·55	1·62	5·08	− 3·46	Berhampore.	
...	18	8	1	2	...	1	...	...	2	?	?	84	?	1·4	2	...	...	0·92	0·33	+ 0·59	3·22	5·01	− 1·79	Rampur. Boalia.	
...	...	3	...	...	...	2	1	24	3	?	?	81	?	0·7	1	...	...	0·26	0·23	+ 0·03	1·41	4·45	− 3·04	Malda.	
14	2	7	1	1	...	...	...	1	2	?	?	86	·615	1·0	2	...	...	3·60	0·27	+ 3·33	4·60	4·28	+ 0·32	Bogra.	
...	4	15	4	3	...	1	...	3	2	?	?	78	·562	1·1	0	...	...	0·05	0·11	− 0·06	0·53	5·14	− 4·61	Dinajpur	North Bengal.
2	3	8	15	2	...	...	...	...	2	?	?	86	?	0·4	0	...	...	0	0·29	− 0·29	10·52	4·95	+ 5·57	Rangpur.	
1	15	5	1	3	...	...	1	4	3	?	?	80	·547	0·2	0	...	...	0	0·16	− 0·16	1·44	5·56	− 4·12	Jalpaiguri.	
...	18	2	1	...	...	...	...	9	4	?	?	81	·583	1·5	3	...	...	2·16	0·89	+ 1·27	3·19	7·08	− 3·89	Balasore	Orissa.
...	17	1	1	...	...	...	3	8	9	7	+ 29	83	·627	3·6	3	...	...	11·10	2·09	+ 9·01	12·29	10·91	+ 1·38	False Point.	
9	1	3	1	...	...	3	8	6	2	2	0	73	·567	2·6	2	...	...	4·69	1·22	+ 3·47	6·66	5·40	+ 1·26	Cuttack.	
...	17	4	1	...	...	...	2	6	9	?	?	74	·689	2·2	3	...	...	10·10	?	?	10·10	?	?	Shortt's Island.	
...	11	1	...	...	...	...	...	1	?	?	?	76	?	2·3	1	...	...	15·91	2·60	+13·31	16·53	10·80	+ 5·73	Puri.*(a)	
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·05	0·21	−0·15	...	...	...	**Gangetic Plain and Chota-Nagpur.**	
	9	2	4	1	1	1	3	5	5	4	+25	63	·420	2·1	0	...	...	0·15	0·33	− 0·18	0·42	3·43	− 3·01	Hazaribagh.	Chota-Nagpur.
11	5	1	...	...	...	1	3	9	4	?	?	72	?	2·3	1	...	...	0·17	0·34	− 0·17	0·64	3·41	− 2·77	Ranchi.	
10	2	3	1	...	1	7	6	...	2	?	?	75	·535	1·6	1	...	...	0·55	0·34	+ 0·21	1·58	3·32	− 1·74	Chaibassa.	
1	4	...	4	1	14	1	4	1	5	1	+400	70	·481	2·2	0	...	...	0	0·49	− 0·49	1·81	2·86	− 1·05	Gaya	Bihar, South.
...	1	...	1	1	3	12	1	3	?	?	?	69	?	0·6	0	...	...	0	?	?	0·50	?	?	Dehri.(b)	
...	...	3	9	...	1	2	9	6	2	2	0	68	·500	1·4	0	...	...	0	0·21	− 0·21	1·72	3·33	− 1·61	Patna	
...	2	1	3	3	2	4	10	5	2	?	?	78	?	0·1	0	...	...	0	0·21	− 0·21	1·51	3·09	− 1·58	Arrah.	
...	3	4	1	...	...	3	7	12	3	?	?	67	?	1·1	0	...	...	0	0·24	− 0·24	1·20	3·34	− 2·14	Buxar.	
20	3	2	2	1	...	1	...	1	1	1	0	86	·513	0·7	0	...	...	0	0·14	− 0·14	0·98	3·83	− 2·85	Purnea	Bihar, North.
28	...	1	1	...	...	...	...	...	0	?	0	77	?	1·3	0	...	...	0·01	0·21	− 0·20	0·20	4·04	− 3·84	Bhagalpur.	
19	1	2	4	...	...	...	2	2	1	2	−50	80	·534	0·4	0	...	...	0	0·07	− 0·07	1·02	3·66	− 2·64	Darbhanga.	
4	3	2	2	...	...	1	2	2	2†	?	?	89	?	0·4	0	...	...	0	?	?	0·93	?	?	Muzaffarpur.*	
5	1	2	2	2	...	2	8	8	3	?	?	84	?	0·3	0	...	...	0	0·07	− 0·07	3·98	3·52	+ 0·46	Motihari.	
3	2	2	3	1	4	5	3	7	2	?	?	81	?	0·6	0	...	...	0	0·23	− 0·23	0·34	3·08	− 2·74	Chupra.	
22	...	1	...	...	1	3	3	...	2	2	0	81	·480	0·7	0	...	...	0	0·39	− 0·39	3·63	2·84	+ 0·79	Benares	N.-W. Provinces (Eastern Districts).
18	1	...	...	...	...	...	8	3	1	1	0	74	·470	0·4	0	...	...	0	0·14	− 0·14	2·47	1·79	+ 0·68	Allahabad.	
7	2	...	1	...	1	1	13	5	1	1	0	80	·520	0·1	0	...	...	0	0·06	− 0·06	7·51	3·86	+ 3·65	Gorakhpur	N.-W. Provinces (Eastern Sub-montane).
26	2	...	...	...	...	...	1	1	2	1	+100	82	·494	0·2	0	...	..	0	0	0	1·95	0·73	+ 1·22	Lucknow	Oudh, South.
3	6	5	2	...	3	3	4	4	2	?	?	72	·440	0·5	0	...	...	0	0·02	− 0·02	0·35	1·10	− 0·75	Cawnpore	N.-W. Provinces (Central).
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·04	0·17	−0·13	...	...	...	**Upper—Sub-Himalayas.**	
30	...	...	...	...	...	...	...	...	0	2	0	82	·449	0	0	...	...	0	0·20	− 0·20	0·24	1·17	− 0·93	Bareilly	N.-W. Provinces (Sub-montane).
23	...	...	4	...	3	...	...	...	2	2	0	74	·357	0·8	0	...	...	0	0·23	− 0·23	3·48	1·08	+ 2·40	Dehra Dun.	
23	...	1	...	2	2	...	1	1	1	1	0	80	·395	0·5	0	...	...	0	0·21	− 0·21	2·57	0·64	+ 1·93	Roorkee.	
24	...	...	...	...	...	...	6	...	1	1	0	79	·377	0·3	0	...	...	0·05	0·08	− 0·03	2·94	0·68	+ 2·26	Meerut.	
16	...	...	...	...	...	5	9	...	1	2	− 50	65	·362	0·7	1	...	...	0·10	0·07	+ 0·03	0·56	0·24	+ 0·32	Delhi	Punjab (Central).
21	1	...	1	1	1	1	4	...	1	1	0	67	·345	1·2	0	...	...	0	0·07	− 0·07	1·12	0·29	− 0·83	Lahore.	

* Observations of 16 days.
(b) Twenty-two days wind observations.

† Mean of 15 days.

*(a) Observations for 25 days, wind observations for 13 days.

Tabl

Abstract of Observations taken at 8 A.M., at 161 Station

Meteorological Province or District.	Station.	Height of Station in feet.	Pressure, 8 A.M., in inches. 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.	Temperature of Air. 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.
Punjab (Sub-montane).	Ludhiana	811·86	29·190	—·003	30·019	29·334	30th	29·059	14th	·275	58·7	82·6	+1·8	51·6	+1·6	67·2	+1·7	31·0	87·2	1st	46·7	3 days	40·5
Punjab, North	Sialkot	829·47	29·168	+·001	30·019	29·319	30th	29·049	14th	·270	58·8	82·1	+1·1	52·4	+4·2	67·3	+2·7	29·7	86·6	4 days	45·3	25th	41·3
	Rawalpindi	1,648·9	28·359	+·001	30·048	28·478	30th	28·267	14th	·211	53·5	78·4	+1·3	45·9	+4·0	62·2	+2·7	32·5	84·0	5th	3·94	25th	44·6
Indus Valley and North-West Rajputana.		...	...	—·007	...	...	...	...	...	...	...	87·8	+3·1	57·1	+4·5	72·0	+3·8	30·7	...	...	...	...	...
Punjab, West	Peshawar	1,110·46	28·946	+·012	30·059	29·081	30th	28·851	13th & 14th.	·230	54·9	78·9	+1·6	48·9	+5·1	64·0	+3·4	30·0	85·1	3rd & 10th.	41·4	24th & 25th.	43·7
	Khushab	611·51	29·398	?	30·020	29·547	30th	29·290	14th	·257	57·9	84·5	?	50·2	?	67·4	?	34·3	90·9	10th	40·1	22nd & 25th.	50·8
	Montgomery	558·46	29·462	?	30·016	29·586	30th	29·327	13th	·259	64·5	86·7	?	52·9	?	69·8	?	33·8	93·8	12th	44·8	24th	49·0
	D. I. Khan	572·56	29·442	—·016	30·026	29·576	30th	29·336	13th	·240	55·1	84·9	+2·7	50·8	+4·9	67·9	+3·8	34·1	91·6	10th & 16th.	42·9	23rd & 24th.	48·7
	Mooltan	420·19	29·597	—·021	30·006	29·694	27th	29·464	13th	·230	61·9	86·9	+2·4	55·7	+4·3	71·3	+3·4	31·2	93·3	4th	48·3	24th	45·0
	Sirsa	661·61	29·352	—·002	30·018	29·463	30th	29·198	14th	·265	60·4	87·5	+3·0	52·8	+5·2	70·2	+4·1	34·7	93·4	1st	44·2	25th	49·2
Sind and Cutch.	Jacobabad	185·9	29·849	—·009	30·005	29·961	30th	29·729	13th	·232	63·7	90·5	+4·3	54·4	+5·2	72·5	+4·8	36·1	98·5	4th	48·0	3 days	50·5
	Hyderabad	117·43	29·923	—·004	29·997	30·023	30th	29·801	13th	·222	68·9	92·7	+5·1	62·5	+3·5	77·6	+4·3	18·7	97·2	12th	56·1	30th	41·1
	Kurrachee	49	29·997	—·006	29·999	30·089	30th	29·871	13th	·218	68·9	90·0	+2·7	64·2	+3·3	77·1	+3·0	25·8	95·5	3rd & 4th.	58·0	30th	37·5
	Bhuj	394·9	29·627	?	29·983	29·712	30th	29·531	14th	·181	75·0	92·1	?	64·4	?	78·3	?	27·7	95·9	13th	58·6	28th	37·3
Rajputana, West	Bickaneer	743·5	28·926	?	29·650	29·017	3rd	28·855	21st	·162	68·0	87·1	?	63·0	?	75·1	?	24·1	92·0	2nd	55·0	21st	37·0
	Pachpadra	380	29·679	?	30·050	29·751	30th	29·578	14th	·173	67·4	91·6	?	53·3	?	72·5	?	38·3	95·5	3rd, 11th & 13th.	41·9	24th	53·6
East Rajputana, Central India and Guzerat.		...	...	+·013	...	...	...	...	...	...	...	86·7	+1·5	56·1	+0·2	71·4	+0·9	30·6	...	...	...	...	...
Rajputana, East	Jeypore	1,430·6	28·604	+·007	30·058	28·710	30th	28·490	14th	·220	63·6	86·8	+2·3	52·7	—0·2	69·8	+1·1	34·1	92·1	2nd	46·7	22nd	45·4
	Sambhar	1,253·52	28·758	—·006	30·038	28·854	30th	28·635	14th	·219	59·9	85·5	+3·1	52·0	0	68·8	+1·6	33·5	90·4	2nd	43·9	23rd	46·5
	Ajmere	1,611	28·439	+·024	30·084	28·532	30th	28·327	14th	·205	61·4	86·7	+3·4	51·9	+2·9	69·3	+3·2	34·8	91·4	2nd	46·3	4 days	45·1
	Deesa	465·5	29·569	+·009	30·005	29·652	30th	29·467	14th	·185	70·5	95·1	+4·7	58·5	+1·8	76·8	+3·3	36·6	98·8	3rd & 12th.	50·4	24th	48·4
Kathiawar	Rajkot	428·83	29·601	+·018	29·994	29·689	30th	29·497	14th	·192	72·3	91·6	+1·4	58·4	0	75·0	+0·7	33·2	94·9	days	50·0	23rd	44·9
	Veraval	?	30·000	?	29·961	30·084	27th	29·919	6th & 14th.	·165	75·5	89·8*	?	65·6*	?	77·7*	?	24·2	95·8	13th	58·3	23rd	37·5
	Bhavnagar	?	29·622	?	29·609	29·708	30th	29·543	6th	·165	69·4	89·2	?	61·5	?	75·3	?	27·7	94·4	13th	50·0	23rd	44·4
Central India	Nowgong	757·04	29·282	+·007	30·035	28·407	30th	28·175	14th	·232	62·7	81·0	—1·5	52·7	+0·9	66·9	—0·3	28·3	86·0	16th	47·4	22nd & 23rd.	38·6
	Sutna	1,040·1	28·977	—·001	30·026	29·104	30th	28·885	14th	·219	63·4	80·1	—0·3	52·9	+0·1	66·5	—0·1	27·2	84·0	7th	47·3	22nd & 23rd.	36·7
	Indore	1,823·2	28·200	+·022	30·028	28·300	30th	28·112	14th	·188	67·8	82·8	+1·0	50·0	—4·0	66·4	—1·5	32·8	85·5	16th	45·6	24th	39·9
	Neemuch	1,630	28·406	+·015	30·052	28·498	30th	28·312	14th	·186	65·9	85·2	+1·7	53·2	—1·0	69·2	+0·4	32·0	88·3	2nd & 3rd.	47·9	23rd	40·4
Guzerat	Surat	36	29·994	+·027	29·974	30·076	30th	29·904	6th	·172	71·6	90·6	+0·7	60·7	—1·8	75·6	—0·6	29·9	94·2	1st	52·6	17th	41·6
N.-W. P., West	Agra	555·44	29·497	+·009	30·043	29·631	30th	29·366	14th	·265	62·6	83·8	—0·2	56·1	+1·2	70·0	+0·5	27·7	87·6	2nd	49·6	26th	38·0
	Jhansi	840·13	29·187	+·021	30·018	29·311	30th	29·085	14th	·226	67·8	85·4	+1·3	58·7	+2·4	72·1	+1·9	26·7	89·4	16th	53·9	4 days	35·5
Deccan		..	...	+·015	...	...	...	...	...	...	...	85·3	+1·4	57·2	—1·8	71·2	—0·2	28·3	...	...	...	...	...
Bombay, Deccan	Belgaum	2,524	27·448	+·012	29·935	27·532	30th	27·337	6th	·195	70·2	83·1	+1·4	59·3	—2·6	71·2	—0·6	23·8	85·3	6th & 7th.	51·9	24th	33·4
	Sholapur	1,589·7	28·421	+·035	29·985	28·512	30th	28·304	6th	·208	72·6	89·5	+2·6	59·5	—3·1	74·5	—0·3	30·0	93·7	9th	52·1	23rd	41·6
	Poona	1,840·37	28·176	+·028	30·011	28·271	30th	28·073	6th	·198	68·3	88·7	+3·7	56·7	—3·4	72·8	+0·2	32·0	91·5	1st	49·5	25th	42·0
Khandeish	Malegaon	1,430·12	28·604	+·028	30·038	28·694	30th	28·509	6th	·185	66·1	86·9	+1·3	52·8	—4·1	69·9	+1·4	34·1	90·4	1st & 10th.	45·0	30th	45·4
	Ahmednagar	2,151·62	27·865	?	30·008	27·956	30th	27·767	6th	·189	68·2	84·5	?	54·8	?	69·7	?	29·7	87·3	8th & 10th.	46·9	24th & 25th.	40·4
Berar	Akola	930	29·098	+·025	30·016	29·202	30th	28·978	6th	·224	66·3	87·0	+1·0	53·5	—3·5	70·3	—1·3	33·5	90·5	7th	48·1	3 days	42·4
	Amraoti	1,215·5	28·795	+·013	29·998	28·901	30th	28·678	6th	·223	70·0	86·7	+1·3	61·9	+1·4	74·3	+1·4	24·8	89·8	8th	57·8	22nd & 23rd.	32·0

* Mean of 29 days.

I —*continued.*

in India, Burma, &c., in November 1891 —continued.

Wind Direction. Number of Winds from: Calm.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	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.	Normal rainfall for period 1st October to 30th November.	Variation from normal of period.	Station.	Meteorological Province or District.
22	...	...	3	2	...	...	3	...	1	1	0	70	·346	1·6	0	...	...	0·08	0·16	−0·08	1·48	0·58	+0·90	Ludhiana.	Punjab (Sub-montane).
25	3	1	...	...	...	...	1	...	0	1	0	77	·363	1·5	0	...	...	0	0·10	−0·10	0·96	0·31	+0·65	Sialkot .	Punjab, North.
16	3	...	...	...	1	1	3	6	1	1	0	76	·318	1·5	0	...	...	0·10	0·40	−0·30	1·08	0·92	+0·16	Rawalpindi.	
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·04	0·10	−0·06	...	...	...	**Indus Valley and North-West Rajputana.**	
19	1	1	...	...	2	3	3	1	2	2	0	74	·324	2·6	1	...	...	0·37	0·38	−0·01	0·57	0·50	+0·07	Peshawar .	Punjab, West.
16	5	7	...	...	...	...	1	1	3	?	?	52	·254	1·3	0	...	...	0·08	0·33	−0·25	0·11	0·40	−0·39	Khushab.	
10	1	3	6	6	3	...	...	1	3	?	?	58	·359	1·5	0	...	...	0	0·07	−0·07	0	0·13	−0·13	Montgomery	
19	1	2	4	1	1	...	1	1	1	1	0	66	·288	1·1	0	...	...	0	0·14	−0·14	0	0·18	−0·18	D. I. Khan.	
15	...	9	...	6	...	...	...	...	1	1	0	63	·356	0·7	0	...	...	0	0·07	−0·07	0	0·07	−0·07	Mooltan.	
5	1	...	...	...	7	3	11	3	4	2	+100	74	·391	0·9	0	...	...	0	0·03	−0·03	0·06	0·22	−0·16	Sirsa.	
22	1	1	4	2	...	...	...	...	1	2	−50	54	·328	1·3	0	...	...	0	0	0	0	0	0	Jacobabad	Sind and Cutch.
1	22	...	...	...	1	6	...	...	5	6	−17	50	·354	2·2	0	...	...	0	0·06	−0·06	0	0·06	−0·06	Hyderabad.	
1	5	17	7	...	...	...	...	...	8	8	0	66	·469	0·9	0	...	...	0	0	0	0	0	0	Kurrachee.	
4	4	3	2	...	...	2	7	5	5	5	0	52	·444	1·0	0	...	...	0	0·02	−0·02	0	0·82	−0·82	Bhuj (*a*)	
...	2	...	...	4	1	12	4	7	4	3	+33	37	·251	0·9	0	...	...	0	0·06	−0·06	0	0·14	−0·14	Bickaneer .	Rajputana, West.
8	...	10	7	2	...	...	...	3	?	2	?	28	·191	0·5	0	...	...	0	0	0	0	0·05	−0·05	Pachpadra.	
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0	0·16	−0·16	...	...	...	**East Rajputana, Central India and Guzerat.**	
21	2	1	...	...	...	1	3	2	2	3	−33	57	·342	0·5	0	...	...	0	0·08	−0·08	0·69	0·44	+0·25	Jeypore .	Rajputana, East.
28	...	...	2	...	...	...	...	...	3	3	0	56	·293	0·2	0	...	...	0	0·08	−0·08	0·33	0·30	+0·03	Sambhar.	
26	...	...	...	...	...	2	...	2	2	1	+100	58	·314	0·3	0	...	...	0	0·07	−0·07	0·12	0·82	−0·20	Ajmere.	
...	...	6	22	2	...	...	...	...	7*	8	−13	30	·225	0·7	0	...	...	0	0·08	−0·08	0	0·48	−0·48	Deesa.	
16	1	2	9	2	...	...	...	...	4	5	−20	53	·420	0·2	0	...	...	0	0·35	−0·35	0·41	0·74	−0·33	Rajkot .	Kathiawar.
12	9	9	...	...	...	...	...	...	6	?	?	48	·424	0·4	0	...	...	0	?	?	0·05	?	?	Veraval.	
...	3	2	...	...	...	8	8	9	6	?	?	65	·476	0·3	0	...	...	0	?	?	0·02	?	?	Bhavnagar.	
8	4	3	1	...	...	1	10	3	1	1	0	71	·406	0·2	0	...	...	0	0·28	−0·28	1·96	1·42	+0·54	Nowgong .	Central India.
4	17	1	...	1	...	...	1	6	3	3	0	71	·417	0·3	0	...	...	0	0·28	−0·28	3·28	2·50	+0·78	Sutna.	
11	5	4	5	3	1	...	..	1	2	2	0	48	·325	0	0	...	...	0	0·36	−0·36	0·72	2·18	−1·46	Indore.	
14	3	4	4	1	...	...	1	3	5	8	−38	51	·326	0·1	0	...	...	0	0·06	−0·06	0·27	0·79	−0·52	Neemuch.	
...	7	19	2	...	...	...	...	2	?	6	?	57	·451	0·3	0	...	...	0	0·18	−0·18	0·18	1·93	−1·75	Surat .	Guzerat.
6	...	1	...	2	...	5	2	14	2	3	−33	67	·382	0·2	0	...	...	0	0	0	0·97	0·45	+0·52	Agra .	N.-W. P. West.
17	1	...	...	...	...	5	3	4	1	2	−50	54	·370	0·3	0	...	...	0	0·08	−0·08	0·29	0·87	−0·58	Jhansi.	
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·06	0·81	−0·73	...	...	...	**Deccan.**	
6	4	7	8	3	1	...	...	1	2	12	−83	57	·426	1·2	2	...	...	1·16	1·86	−0·70	9·00	7·16	+1·84	Belgaum .	Bombay, Deccan.
1	3	10	8	7	...	...	...	1	8	8	0	46	·377	1·5	0	...	...	0	0·94	−0·94	5·78	5·44	+0·34	Sholapur.	
20	...	...	8	2	...	...	...	...	6	6	0	41	·336	1·0	0	...	...	0·02	1·22	−1·20	3·26	5·53	−2·27	Poona.	
1	1	6	...	...	...	2	12	8	4	4	0	44	·288	0·9	0	...	...	0	0·75	−0·75	1·79	4·27	−2·48	Malegaon .	Khandeish.
4	3	3	3	8	...	1	2	6	5	?	?	66	·464	1·2	0	...	...	0	0·72	−0·72	2·03	3·82	−1·79	Ahmednagar	
15	2	2	9	2	...	...	...	...	3	3	0	57	·371	0·6	0	...	...	0	0·81	−0·81	1·50	4·44	−2·94	Akola .	Berar.
...	1	17	12	...	...	...	...	...	5	3	+ 67	48	·355	0·4	0	...	...	0	0·64	−0·64	3·34	3·58	−0·24	Amraoti.	

* Mean of 23 days.

(*a*) Wind observations of 25 days.

Table

Abstract of Observations taken at 8 A.M., at 161 Station.

Meteorological Province or District.	Station.	Height of Station in feet.	Pressure, 8 A.M., in inches. 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.	Temperature of Air. 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.
Central Provinces, West.	Khandwa	1,043·71	28·987	+·033	30·036	29·087	30th	28·890	14th	·197	63·1	85·2	−0·1	51·8	−4·1	68·5	−2·1	33·4	88·7	9th	46·1	23rd	42·6
	Hoshangabad	1,020	29·022	+·009	30·050	29·132	30th	28·915	6th	·217	61·8	83·8	+0·1	55·8	−0·7	69·8	−0·3	28·0	86·3	4 days.	50·3	24th	36·0
	Nagpur	1,025	28·986	+·012	29·999	29·103	30th	28·856	6th	·247	70·1	84·5	+0·4	59·5	−0·1	72·0	+0·2	25·0	88·3	9th	54·2	23rd	34·1
Central Provinces, Central.	Seoni	2,030	27·973	−·003	30·039	28·077	30th	27·864	6th	·213	65·9	81·0	+0·2	52·4	−2·8	66·7	−1·3	28·6	85·1	9th	47·0	24th	38·1
	Jubbulpore	1,327·02	28·696	+·014	30·045	28·810	30th	28·585	6th	·225	60·4	81·2	+0·2	51·9	−0·4	66·6	−0·1	29·3	84·4	16th	45·9	23rd	38·5
	Saugor	1,761·5	28·252	−·003	30·034	28·363	30th	28·160	6th	·203	63·8	82·8	+2·0	54·8	−1·3	68·8	+0·4	28·0	86·3	16th	50·9	3 days.	35·4
Central Provinces, East.	Raipur	960	29·042	+·010	29·994	29·151	30th	28·886	5th	·265	69·7	83·3	+1·1	60·8	+0·7	72·1	+0·9	22·5	87·5	9th	54·3	23rd	33·2
Hyderabad, North.	Aurangabad	?	28·169	?	?	28·272	30th	28·063	6th	·209	71·7	86·6	?	57·4	?	72·0	?	29·2	91·8	11th	49·3	23rd	42·5
Hyderabad, South.	Gulburga	?	28·488	?	?	28·580	30th	28·375	6th	·205	71·5	?	?	60·8	?	?	?	?	?	?	51·7	22nd	?
	Secunderabad	1,786·69	28·204	+·003	29·975	28·314	30th	28·082	6th	·232	70·3	86·9	+4·0	60·8	−1·4	73·9	+1·3	26·1	91·6	9th	53·1	24th	38·5
	Hyderabad* (Deccan).	?	28·310	?	?	28·416	30th	28·174	13th	·242	69·2	85·9	?	59·2	?	72·5	?	26·7	89·3	11th	54·5	24th	34·8
	Kamamet	?	29·629	?	?	29·755	30th	29·480	5th	·275	71·3	88·4	?	63·4	?	75·9	?	25·0	92·8	7th	55·7	24th	37·1
West Coast		...		+·016	...	...	...	...	...	...	...	88·1	+1·5	70·4	−1·1	79·3	+0·2	17·7	...	...	...	...	...
Konkan	Bombay	37	29·969	+·020	29·946	30·062	30th	29·856	7th	·206	76·3	87·8	+1·1	73·6	+0·4	80·7	+0·8	14·2	91·4	11th	69·0	25th	22·4
	Ratnagiri	110	29·853	+·017	29·902	29·952	30th	29·723	6th	·229	80·5	92·7	+2·3	68·1	−2·1	80·4	+0·1	24·6	96·4	12th	62·9	22nd & 23rd.	33·5
	Mormugoa	?	29·908	?	29·903	30·000	30th	29·765	6th	·235	75·1	88·9	?	71·8	?	80·4	?	17·1	93·0	12th	66·3	22nd & 23rd.	26·7
	Karwar	43·87	29·917	+·007	29·897	30·008	27th	29·764	6th	·244	71·9	85·0	+2·2	66·8	−2·8	77·9	−0·3	22·2	91·3	6 days.	61·0	5 days	30·3
Malabar	Mangalore	25·60	29·944	+·019	29·903	30·038	27th	29·804	6th	·234	77·2	87·8	+0·7	72·3	−0·6	80·1	+0·1	15·5	93·8	2nd	66·0	22nd & 23rd	27·8
	Calicut	26·58	29·936	+·012	29·895	30·033	27th	29·817	5th	·216	78·2	87·3	?	72·8	?	80·1	?	14·5	88·8	8 days.	66·6	24th	22·2
	Cochin	11·03	29·959	+·023	29·899	30·046	27th	29·868	5th	·178	78·5	87·8	+1·1	73·7	−0·5	80·8	+0·3	14·1	89·2	5 days.	69·7	20th	19·5
	Trivandrum	?	29·628	?	29·906	29·716	27th	29·555	5th	·161	77·4	83·3	?	64·1	?	73·7	?	19·2	85·5	21st	60·0	21st	25·5
South India		...	...	+·010	...	...	...	...	...	...	...	86·7	+2·4	69·3	−0·2	78·0	+1·1	17·4	...	...	...	...	...
Madras, South	Pamban	37	29·931	?	29·895	30·025	27th	29·852	6th	·173	79·9	84·4	?	75·5	?	80·1	?	8·9	88·3	9th	71·2	30th	17·1
	Madura	446·60	29·518	+·021	29·907	29·612	27th	29·431	6th	·181	77·7	86·8	−0·6	72·9	+0·7	79·9	+0·1	13·9	90·3	21st	68·6	15th	21·7
Madras, South Central.	Salem	939·91	29·051	+·015	29·945	29·145	27th	28·951	5th	·194	76·5	90·0	+3·4	68·6	+0·8	79·3	+2·1	21·4	92·9	21st	60·9	19th & 20th.	32·0
	Coimbatore	1,347·64	28·614	+·009	29·927	28·722	27th	28·511	5th	·211	74·1	87·2	+1·5	68·3	−1·0	77·8	+0·3	18·9	92·3	30th	61·1	24th	31·2
Coorg	Mercara	3,780·7	26·258	?	29·910	26·342	27th	26·148	6th	·194	65·6	76·6	+1·7	59·1	−1·5	67·9	+0·1	17·5	78·8	14th	53·2	23rd & 24th,	25·6
Mysore	Bangalore	2,981·46	27·047	+·023	29·970	27·134	27th	26·950	5th	·184	70·0	82·0	+3·8	61·3	−0·8	71·7	+1·5	20·7	85·2	th	52·9	23rd	32·3
Madras, East Coast, South.	Negapatam	15	29·928	+·013	29·890	30·022	27th	29·845	5th	·177	79·2	86·8	+3·2	74·4	+0·5	80·6	+1·9	12·4	91·7	5th	71·2	2nd	20·5
	Cuddalore	12·44	29·951	?	29·894	30·052	27th	29·850	6th	·202	77·6	85·8	?	72·3	?	79·0	?	13·5	89·2	7th	66·2	22nd & 23rd,	23·0
	Trichinopoly	254·78	29·710	+·009	29·902	29·795	27th	29·607	6th	·188	77·9	88·1	+1·5	72·4	+0·8	80·3	+1·2	15·7	92·0	7th & 21st	67·4	19th	24·6
	Madras	22	29·954	+·010	29·909	30·053	27th	29·850	5th & 6th	·203	78·2	86·9	+2·3	72·2	−0·4	79·6	+1·0	14·7	90·0	26th	64·0	22nd	26·0
Madras, East Coast, Central.	Nellore	70·82	29·904	?	29·911	30·021	30th	29·774	6th	·247	78·7	89·0	?	72·0	?	80·5	?	17·0	95·2	7th	65·6	24th	29·6
	Masulipatam	15	29·979	+·003	29·930	30·094	28th & 30th.	29·823	5th	·271	76·9	88·4	+3·8	70·4	−1·1	79·4	+1·4	18·0	94·1	7th	62·2	22nd	31·9
Madras, Central	Cuddapah	433·36	29·561	?	29·940	29·652	30th	29·428	6th	·224	78·2	91·4	?	69·2	?	80·3	?	22·2	95·6	8th	58·8	22nd	36·8
	Kurnool	923·45	29·065	?	29·952	25·163	27th	28·937	6th	·226	74·2	90·7	?	62·3	?	76·5	?	28·4	94·0	1st & 7th.	51·2	21st & 25th,	42·8
	Bellary	1,474·63	28·512	+·027	29·958	28·606	30th	28·385	6th	·221	73·6	89·0	+2·5	65·1	−0·8	77·1	+0·9	23·9	93·9	6th	58·6	21st & 25th,	35·3
Madras, East Coast, North.	Rajahmundry	112	29·861	?	29·913	29·981	30th	29·664	5th	·317	74·7	90·1	?	69·2	?	79·7	?	20·9	93·0	16th	64·0	2 da ys	29·0
	Coconada	26	29·956	?	29·918	30·077	28th & 30th	29·737	5th	·340	76·3	85·2	?	69·3	?	77·3	?	15·9	90·2	5th & 6th.	63·7	23rd	26·5
	Vizagapatam	31	29·952	−·019	29·922	30·084	30th	29·732	5th	·352	80·1	84·3	+2·9	75·8	+2·9	80·1	+2·9	8·5	86·9	2 days	70·9	12th	16·0
	Gopalpur	21·45	29·968	0	29·930	30·107	30th	29·624	5th	·483	73·3	84·2	+3·2	66·2	−3·0	75·2	+0·1	18·0	87·7	2 days	60·9	4 days.	26·8
Hill Stations		...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Beluchistan	Quetta	5,502·28	24·805	+·057	?	24·874	30th	24·713	14th	·161	46·4	70·6	+6·6	35·4	+4·8	53·0	+5·7	35·2	77·2	12th	27·8	20th	

* Mean of 21 days observations from 10th to 30th.

I —*continued.*

in India, Burma, &c., in November 1891 —continued.

Wind Direction. Number of Winds from: Calm.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	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 1891.	Normal rainfall for period 1st June to 30th September.	Variation from normal of period from 1st June to 30th September.	Station.	Meteorological Province or District.
16	3	10	1	...	...	...	...	...	3	3	0	59	·342	0·2	0	...	...	0	0·35	− 0·35	1·65	2·32	− 0·67	Khandwa	Central Provinces, West.
5	1	5	9	2	8	...	...	...	3	2	+50	67	·373	0·2	0	...	...	0	0·39	− 0·39	6·05	2·47	+ 3·58	Hoshangabad.	
14	12	3	...	...	...	...	...	1	3	3	0	55	·412	0·5	0	...	...	0	0·79	− 0·79	0·59	3·81	− 3·22	Nagpur.	
...	7	15	4	1	...	...	...	3	1†	3	−67	62	·399	0·3	0	...	...	0	0·42	− 0·42	0·85	2·40	− 1·55	Seoni	Central Provinces, Central.
20	1	...	1	5	3	...	...	...	1	2	−50	77	·406	0·3	0	...	...	0	0·51	− 0·51	0·51	2·58	− 2·07	Jubbulpore.	
...	4	13	2	7	...	2	1	1	1	2	− 50	63	·376	0·2	0	...	...	0	0·46	− 0·46	1·95	2·20	− 0·25	Saugor.	
7	8	7	2	...	...	...	2	4	4	3	+33	63	·458	1·2	0	...	...	0	0·55	− 0·55	1·15	3·02	− 1·87	Raipur	Central Provinces, East.
15	...	3	8	4	...	...	...	...	4	?	?	46	·360	0·7	0	...	...	0	?	?	1·77	?	?	Aurangabad	Hyderabad, Nort.
7	1	8	8	5	1	...	...	...	7	?	?	63	·491	1·7	0	...	...	0	0·61	− 0·64	0§	?	?	Gulberga	Hyderabad, South.
6	2	11	9	...	...	...	1	1	4	4	0	64	·484	1·8	0	...	...	0	1·85	− 1·85	0·83	4·55	− 3·72	Secunderabad	
5	1	2	3	4	1	...	1	4	5‡	6	−17	62	·445	0·5	0	...	...	0	?	?	?	?	?	Hyderabad* (Deccan).	
5	11	...	3	1	...	...	...	10	4	?	?	74	·569	0·9	0	...	...	0	?		?	?	?	Kamamet.	
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...	1·99	3·37	−1·45	...	...	...	**West sCoat.**	
...	...	14	14	1	1	...	...	...	10	10	0	69	·633	1·4	0	...	...	0·01	0·58	− 0·57	1·17	3·42	− 2·25	Bombay	Konkan.
2	1	...	25	2	...	...	...	...	8	8	0	46	·482	0·4	0	...	...	0·01	0·51	− 0·50	1·42	4·51	− 3·09	Ratnagiri.	
3	...	1	25	1	...	...	...	...	6	?	?	76	·674	0·7	0	...	...	0	?	?	4·71	?	?	Mormugoa.	
6	...	22	2	...	...	...	...	...	2	?	?	80	·631	0·7	2	...	...	0·54	2·87	− 2·33	7·26	10·53	− 3·27	Karwar.	
2	...	7	18	2	...	...	1	...	2	3	−33	80	·748	2·1	4	...	...	2·01	3·29	− 1·28	9·24	10·77	− 1·53	Mangalore	Malabar.
4	...	8	13	4	...	...	1	...	6	?	?	81	·788	3·3	3	...	...	2·77	5·64	− 2·87	17·43	14·80	+ 2·63	Calicut.	
9	...	18	...	2	1	...	...	...	3	?	?	81	·799	3·2	9	...	...	6·22	7·34	− 1·12	33·31	21·07	+12·24	Cochin.	
...	4	2	1	...	3	2	12	6	6	?	?	85	·801	4·3	11	...	...	4·35	?	?	23·36	?	?	Trivandrum.	
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2·72	6·72	−4·48	...	...	...	**South India.**	
1	6	4	4	2	1	3	1	8	4	?	?	80	·814	5·7	14	...	...	11·38	?	?	32·91	?	?	Pamban.	Madras, South.
6	11	6	1	3	...	...	...	3	2	4	− 50	77	·736	4·8	6	...	...	6·85	4·83	+ 2·02	21·42	11·57	+ 9·85	Madura	
13	1	12	3	...	...	1	...	...	2	3	−33	80	·743	4·2	3	...	..	1·12	4·53	− 3·41	4·76	11·95	− 7·19	Salem	Madras, South Central.
...	9	9	2	...	4	3	3	...	3	3	0	84	·719	5·7	2	...	...	0·70	4·15	− 3·45	15·90	9·87	+ 6·03	Coimbatore.	
...	3	6	19	...	2	...	...	...	4	4	0	74	·473	5·9	4	...	...	2·11	4·06	− 1·95	12·86	13·67	− 0·81	Mercara	Cooro.
...	4	9	10	3	2	...	2	...	3	4	−25	73	·542	4·9	1	...	...	0·44	3·69	− 3·25	7·86	11·38	−3·52	Bangalore	Mysore.
6	2	1	1	...	2	1	6	11	3	5	−40	81	·814	6·3	10	...	...	6·23	17·88	−11·65	21·98	29·57	− 7·59	Negapatam	Madras, East Coast, South.
...	9	...	...	1	1	1	4	14	2	?	?	90	·857	3·5	9	...	...	8·04	13·80	− 5·76	26·69	22·91	+ 3·78	Cuddalore.	
14	2	12	...	...	1	...	1	...	3	4	−25	80	·769	5·1	7	...	...	2·31	5·50	− 3·19	13·00	11·71	+ 1·29	Trichinopoly	
...	13	5	1	...	1	2	1	7	6	7	−14	81	·787	5·0	7	...	...	4·77	16·67	−11·90	18·19	29·29	−11·10	Madras.	
1	...	1	...	3	...	1	...	24	5	?	?	79	·773	6·7	4	...	...	2·79	11·04	− 8·25	5·64	21·29	−15·65	Nellore	Madras, East Coast, Central.
...	19	5	3	...	...	...	...	3	4	6	−33	79	·732	2·8	0	...	...	0	7·00	− 7·00	4·52	15·44	−10·92	Masulipatam.	
...	1	6	6	12	2	3	...	...	?	?	?	63	·652	3·5	2	...	...	0·36	5·43	− 5·07	3·27	11·76	− 8·49	Cuddapah.	Madras, Central.
29	...	...	...	...	...	1	...	...	?	?	?	63	·547	1·0	1	...	...	0·27	1·01	− 0·74	2·33	5·94	− 3·61	Kurnool.	
18	1	...	5	4	...	1	...	1	3	3	0	59	·493	2·7	1	...	...	0·72	2·09	− 1·37	1·90	6·15	− 4·25	Bellary.	
1	26	1	...	...	...	...	...	2	?	?	?	70	·615	3·3	1	...	...	0·45	1·87	− 1·42	1·15	8·47	− 7·32	Rajahmundry	Madras, East Coast, North.
...	16	9	...	...	...	...	...	5	8	?	?	67	·611	1·8	0	..	...	0	3·86	− 3·86	0·71	12·67	−11·96	Cocanada.	
...	13	...	...	...	...	...	12	5	3	2	+50	58	·600	3·8	0	...	...	0·11	8·45	− 8·34	1·61	18·75	−17·14	Vizagapatam.	
...	15	...	...	...	...	...	1	14	11	7	+57	75	·612	1·2	1	...	...	2·94	5·06	− 2·12	4·23	15·45	−11·22	Gopalpur	
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	**Hill Stations.**	
30	...	...	...	...	...	...	...	...	0	3	0	49	·161	1·5	1	...	...	0·13	0	+ 0·13	0·30	0·07	+ 0·23	Quetta	Beluchistan.

† Mean of 28 days. ‡ Mean of 20 days. § Rainfall from 1st to 15th October wanting. Rainfall of Aurangabad from 1st to 5th October wanting. * Mean of 21 days from 10th to 30th.

Table

Abstract of Observations taken at 8 A.M. at 161 Stations

Meteorological Province or District.	Station.	Height of Station 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.
Beluchistan—concld.	Shebo*	?	?	?	?	?	?	?	...	?	47·0	72·7	?	39·5	?	56·1	?	33·2	80·7	2nd	28·6	28th	52·1
Northern India	Srinagar	?	25·049	?	?	25·148	9th	24·918	13th	·230	38·9	59·3	?	34·5	?	46·9	?	24·8	68·4	1st	28·1	25th	40·3
	Murree	6,343·86	23·980	+·057	?	24·054	1st	23·901	14th	·153	52·5	63·5	+2·2	46·9	+1·7	55·2	+2·0	16·6	69·6	10th	37·2	19th	32·4
	Simla	7,274	23·149	+·017	?	23·229	30th	23·062	14th	·167	50·3	57·1	−3·7	46·5	+2·8	51·8	−0·5	10·6	62·2	11th	37·1	19th	25·1
	Mussoorie	?	23·664	?	?	23·760	30th	23·585	20th	·175	51·6	58·7	?	44·8	?	51·8	?	13·9	62·2	4 days	40·0	29th & 30th.	22·2
	Ranikhet	6,068·75	24·181	+·017	?	24·256	30th	24·098	14th	·158	53·6	64·7	+2·5	48·4	+1·9	56·6	−2·2	16·3	68·6	11th & 24th	44·0	29th	24·6
	Gnatong	?	19·272	?	?	19·346	10th	19·152	19th	·194	42·7	52·2	?	20·4	?	36·3	?	31·8	61·9	12th	15·1	29th	46·8
	Darjeeling	7,421·1	23·068	+·012	?	23·173	1st	22·962	7th	·211	50·1	56·9	+2·5	43·7	+2·3	50·3	+2·4	13·2	63·1	10th & 24th	39·5	20th	23·6
	Kalimpong†	?	26·110	?	?	26·218	27th	25·943	24th	·275	55·8	69·8	?	52·6‡	?	61·1*	?	17.2	75·8	9th	50·0	30th	25·8
Central India	Mount Abu	3,945	26·289	+·030	?	26·261	30th	26·122	6th	·139	67·7	74·6	+1·1	58·3	+1·4	66·5	+1·3	16·3	77·6	2 days	52·9	2 days	24·7
	Pachmarhi	3,511	26·575	+ 017	?	26·669	30th	26·465	6th	·184	65·8	73·1	+1·1	49·0	−2·2	61·1	−0·6	24·1	77·3	9th	43·3	24th & 25th.	34·0
South India	Wellington	6,200	24·300	+·046	?	24·378	27th	24·227	6th	·151	57·8	67·4	+0·8	50·2	−2·7	58·8	−1·0	17·2	69·7	11th	39·2	20th	30·5
Extra India		...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Persia	Bushire	14	30·059	?	30·030	30·190	16th	29·931	10th	·259	69·2	77·1	?	64·4	?	70·7	?	12·7	87·1	8th	54·3	17th	32·8
Arabia	Aden	94·1	29·943	?	29·969	30·002	18th	29·879	14th	·123	79·1	86·6	?	75·1	?	80·8	?	11·5	90·3	12th	70·9	9th	19·4

* Mean of 29 days. * Mean of 22 days from 9th to 30th. Mean of 21 days.

I —*concluded.*

in India, Burma, &c., in November 1891 —concluded.

Wind Direction. Number of Winds from									Wind Velocity.			Hygrometry, 8 A.M.		Mean cloud amount.	Rainfall.									Station.	Meteorological Province or 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 30th November 1891.	Normal rainfall for period, 1st October to 30th November.	Variation from normal of period.		
12	1	...	2	5	8	1	...	...	5§	?	?	54	·175	1·6	0	...	...	0	?	?	0·26	?	?	Shebo*	Beluchistan—*concld.*
13	5	...	2	7	3	...	...	...	2	?	?	86	·205	2·4	1	...	...	0·40	?	?	1·39	?	?	Srinagar.	
13	4	...	1	5	...	...	...	7	5	6	−17	36	·140	3·0	3	...	...	2·44	0·84	+1·60	10·46	1·95	+8·51	Murree	Northern India.
4	8	6	...	3	9	...	...	...	?	2	0	41	·147	1·4	1	...	...	0·28	0·65	−0·37	5·78	1·48	+4·30	Simla.	
...	7	4	10	3	2	...	...	4	?	?	?	73	·282	0·2	0	...	...	0	?	?	2·60	?	?	Mussoorie	
22	...	1	...	3	4	...	...	...	2	1	+100	61	·252	0·5	0	...	...	0	0·46	−0·46	1·35	1·50	−0·15	Ranikhet.	
...	...	...	...	...	...	...	...	...	?	?	?	44	·118	0	3	...	...	1·15	?	?	6·89	?	?	Gnatong.	
10	...	8	6	3	...	2	1	...	3	2	+50	65	·227	2·4	0	...	...	0·01	0·42	−0·41	0·89	5·46	−4·57	Darjeeling.	
1	1	5	2	5	...	2	2	4	?	?	?	75	·332	1·0	0	...	...	0	?	?	?	?	?	Kalimpong.†	
15	1	11	2	...	...	...	1	...	4	4	0	33	·222	0·5	0	...	...	0	0·07	−0·07	0·02	0·94	−0·92	Mount Abu	Central India.
1	3	7	14	...	...	...	...	5	3	3	0	45	·283	0·3	0	...	...	0	0·58	−0·58	1·19	3·45	−2·26	Pachmarhi.	
23	2	2	2	...	1	...	...	...	2	2	0	78	·385	4·8	8	...	...	4·92	9·55	−4·63	43·72	20·90	+22·82	Wellington.	South India.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	**Extra India.**	
...	5	17	3	1	1	...	...	3	7	6	+17	71	·514	0	5	...	...	4·37	1·53	+2·84	4·37	1·53	+2·84	Bushire	Persia.
9	...	9	11	...	...	...	...	1	12	12	0	74§	·737§	3·1	0	...	...	0·07	0·11	−0·04	0·25	0·11	+0·14	Aden	Arabia.

Mean of 28 days.

Table

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

Station.	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 to 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.
Murree	24·005	23·972	·033	23·978	+·056	?	63·3	47·0	16·3	69·7	37·0	32·7	56·8	57·6	53·5	+2·6	38·6	45·4	47·7	43·9
Srinagar	25·083	24·978	·105	25·031	?	?	59·0	34·5	24·4	64·3	28·3	36·0	45·4	58·1	46·6	?	33·9	42·5	50·5	42·3
Chamba	27·055	26·968	·087	27·021	0	?	73·3	47·2	26·2	78·8	42·8	36·0	59·2	64·3	56·1	−0·1	44·1	50·8	54·8	46·6
Kailang	20·890	20·807	·084	20·858	+·038	?	55·7	26·9	28·8	60·6	22·5	38·1	43·3	49·0	37·6	+4·4	25·0	31·9	35·9	30·9
Simla	23·175	23·121	·053	23·137	+·018	?	57·0	46·5	10·4	62·2	37·1	25·1	53 3	52·8	50·5	+0·5	37·7	42·8	45·1	41·9
Peshawar	28·965	28·859	·106	28·902	+·002	30·041	78·7	49·1	29·7	85·1	41·4	43·7	66·5	75·5	61·7	+3·7	45·8	57·1	60·7	54·5
Lahore	29·331	29·244	·087	29·278	−·018	29·979	82·8	50·9	32·0	87·5	43·6	43·9	72·8	79·6	64·7	+2·7	48·7	59·5	63·0	57·1
Ludhiana	·200	·110	·089	·144	−·019	·957	82·6	51·6	31·0	85·7	46·7	39·0	71 8	78·5	65·0	+2·4	50·2	59·9	61·8	57·3
Mooltan	·610	·499	·111	·545	−·035	·947	86·5	55·7	30·8	93·3	48·3	45·0	70·1	85·8	69·5	+4·4	49·7	60·2	72·3	60·7
Jacobabad	·874	·755	·119	·804	−·009	·956	90·5	54·4	36·1	95·6	48·0	47·6	78·9	86·8	70·0	+5·1	49·5	62·4	66·0	59·3
Hyderabad	·914	·824	·090	·865	−·028	·936	92·3	62·5	29·8	97·2	56·1	41·1	83·6	89·1	77·6	+5·3	56·1	61·3	63·9	60·5
Kurrachee	30·010	·908	·102	·955	−·006	·957	89·8	64·2	25·6	95·6	58·0	37·6	82·6	85·9	76·6	+2·9	57·7	69·0	72·9	66·5
Jeypore	28·625	28·524	·101	28·565	+·008	·992	86·7	52·7	34·0	92·1	46·6	45·5	78·3	83·7	68·0	+0·6	47·9	60·2	61·3	56·5
Ajmere	·450	·350	·100	·399	+·005	30·013	86·5	51·9	34·6	91·4	46·3	45·1	77·3	84·6	68·1	+2·7	49·3	63·0	66·9	59·7
Mount Abu	26·204	26·128	·076	26·159	+·020	?	74·6	58·3	16·3	77·6	52·9	24·7	71·7	72·2	66·1	+2·2	47·9	53·1	53·4	51·5
Chakrata	23·364	23·309	·055	23·327	+·014	?	62·6	45·3	17·3	69·3	39·6	29·7	57·7	56·4	52·2	−0·9	39·8	47·9	47·6	45·1
Ranikhet	24·204	24·142	·061	24·160	+·008	?	64·6	48·4	16·2	68·6	44·0	24·6	58·7	62·3	55·7	+1·6	41·9	50·5	53·3	48·6
Pithoragarh	·869	·799	·070	·819	+·032	?	69·4	48·5	20·9	72·6	44·9	27·7	61·1	68·5	58·6	+1·7	44·2	54·0	54·8	51·0
Dehra	27·796	27·717	·079	27·746	+·014	·000	76·8	52·9	23·9	80·2	47·5	32·7	68·2	70·5	62·6	0	50·6	59·0	60·3	56·6
Roorkee	29·157	29·064	·092	29·099	+·013	29·988	80·9	52·3	28·6	85·3	47·2	38·1	70·1	76·3	64·8	+0·9	50·4	61·5	63·5	58·5
Meerut	·310	·214	·096	·254	+·010	·986	80·6	52·5	28·1	81·2	47·1	37·1	69·6	77·3	65·1	+0·3	51·8	60·3	63·9	58·7
Agra	·511	·408	·103	·449	+·010	·983	83·6	56·1	27·5	87·7	49·5	38·2	75·3	82·3	69·1	+1·4	52·8	62·2	65·3	60·1
Lucknow	·684	·574	·109	·621	−·008	·963	83·0	54·1	28·9	86·8	49·0	37·8	73·4	80·6	67·9	+0·1	53·0	64·1	65·8	61·0
Allahabad	·745	·624	·121	·675	−·007	·948	84·1	56·0	28·1	88·1	50·1	38·0	75·6	82·3	68·6	−0·5	54·0	64·3	65·0	61·1
Ghazipur	·838	·716	·122	·769	+·031	·949	86·1	59·4	26·7	89·6	55·3	34·3	77·9	81·4	71·4	+3·4	56·5	66·2	65·2	62·6
Nowgong	·283	·179	·105	·224	−·004	·965	80·8	52·8	28·0	86·0	47·4	38·6	72·7	78·6	66·1	−0·4	52·1	61·4	62·9	58·8
Sutna	28·991	28·881	·110	28·929	−·005	·965	80·1	53·2	26·9	84·0	47·8	36·2	74·8	79·2	65·8	−0·3	51·8	61·9	62·4	58·8
Darbhanga	29·894	29·763	·131	29·824	+·007	·948	83·9	60·0	23·9	86·7	55·5	31·2	79·2	81·8	72·1	+0·5	59·3	67·8	68·2	65·1
Patna	·865	·747	·117	·801	−·015	·942	83·6	61·9	21·7	88·0	55·6	32·4	77·4	80·9	71·7	+1·4	58·6	66·2	67·0	63·9
Hazaribagh	28·004	27·911	·093	27·954	−·010	·951	78·5	58·8	19·7	82·9	52·9	30·0	73·4	75·9	67·7	+1·0	54·8	61·0	61·5	59·1
Darjeeling	23·083	23·007	·075	23·039	+·007	?	56·6	43·6	13·0	63·2	39·5	23·7	54·0	53·0	49·1	+1·6	38·8	47·0	48·0	44·6
Pedong										Imperfect.										
Berhampore	29·953	29·841	·112	29·890	−·021	·907	82·7	65·2	17·5	88·1	61·2	26·9	76·3	80·3	73·3	0	63·0	69·6	69·4	67·3
Burdwan	·935	·809	·126	·865	−·015	·914	84·7	64·2	20·5	89·4	60·4	29·0	77·7	81·9	74·3	+0·7	62·8	67·1	67·5	65·8
Calcutta (Alipore)	·989	·877	·112	·925	−·035	·892	82·9	65·2	17·7	86·8	60·1	26·7	77·5	81·1	73·5	+1·1	63·3	68·8	69·0	67·0
Calcutta (Chowringhee)	·992	?	?	?	?	?	83·9	65·5	18·4	88·8	60·9	27·9	79·0	?	?	?	63·9	70·2	?	?
Saugor Island	·977	·870	·107	·918	−·032	·888	82·1	67·0	15·1	87·2	63·8	23·4	78·2	80·1	74·2	+0·8	65·6	71·5	71·3	69·5
Dacca	·987	·869	·119	·924	−·022	·894	84·6	65·6	19·0	90·8	61·9	28·9	78·4	82·2	75·6	+1·0	64·0	71·2	71·3	68·8
Chittagong	·907	·815	·092	·860	−·013	·895	85·0	67·4	17·5	90·8	62·9	27·9	79·6	80·5	75·5	+1·5	66·4	74·0	73·5	71·2
Demagiri			Not recorded.				84·2	68·9	15·3	88·8	64·2	24·6	77·1	83·8	76·5	+2·8	?	?	?	?
Tura							81·5	64·2	17·5	85·0	59·5	25·5	73·3	77·1	71·9	+3·3	?	65·5	68·3	?
Dhubri	·923	·792	·131	·853	0	·899	80·4	62·9	17·5	85·1	58·7	26·4	72·4	79·1	70·0	−0·2	61·6	67·3	69·6	66·2
Sibsagar	·708	·559	·149	·632	−·041	·931	78·2	59·0	19·2		52·2	29·8	70·2	76·6	67·3	−0·4	58·8	66·2	69·6	64·9

II.

at 89 Stations in India, Burma, &c., for November 1891.

Vapour Tension.					Humidity.					Cloud.				Wind Direction. Number of Winds from											Wind Steadiness.		Wind Velocity.		Station.
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.	
·149	·188	·231	·189	+·031	48	41	49	46	+ 4	3·3	4·2	3·7	+0·9	28	3	0	2	16	3	0	0	8	S 54° E	S 46° E	15	17	117	133	Murree.
·192	·242	·285	·239	?	94	79	59	77	?	1·9	1·6	1·8	?	...	19	9	6	11	4	...	2	9	N 31° E	?	38	?	50	?	Srinagar.
·257	·278	·323	·286	+·054	79	55	54	62	+11	1·8	2·8	2·3	+0·6	41	2	...	...	2	6	...	...	9	N 80° W	S 65° E	8	14	69	89	Chamba.
·120	·088	·101	·104	+·005	83	31	30	48	− 1	1·6	3·6	2·6	−0·7	...	...	...	...	4	9	17	17	12	S 66° W	S 53° W	64	65	30	30	Kailang.
·137	·169	·223	·176	−·004	44	42	55	47	− 1	1·4	2·0	1·7	0	9	13	11	1	6	17	...	...	...	S 88° E	S 89° W	23	32	?	?	Simla.
·272	·353	·349	·325	+·056	78	55	40	57	+ 3	2·1	2·4	2·3	+0·5	36	4	8	2	5	3	2	...	...	N 80° E	N 85° E	17	18	47	52	Peshawar.
·318	·335	·357	·337	+·025	85	41	35	54	+ 6	1·4	1·2	1·3	+0·2	34	4	3	3	2	5	...	3	6	N 10° W	N 47° W	7	22	22	33	Lahore.
·338	·363	·332	·344	+·039	85	47	34	55	+ 3	1·8	2·6	2·2	+0·8	35	6	...	1	2	...	...	12	4	N 60° W	N 44° W	23	36	23	21	Ludhiana.
·281	·395	·618	·431	+·086	63	53	49	55	+ 2	1·0	1·1	1·1	+0·4	15	...	18	...	19	...	8	...	...	S 72° E	S 73° W	35	8	31	33	Mooltan.
·294	·346	·366	·367	+·069	69	35	29	50	+ 6	1·5	1·6	1·5	+0·6	43	2	1	5	1	2	2	2	2	E	N 12° W	3	16	34	37	Jacobabad.
·360	·216	·260	·288	−·083	62	21	19	34	−12	3·2	3·3	3·2	+2·4	...	...	46	...	2	...	11	...	1	N 47° E	N 18° W	59	44	129	147	Hyderabad.
·399	·533	·638	·521	+·081	66	49	52	58	+ 4	0·9	0·7	0·8	−0·3	...	4	12	3	2	2	22	12	3	S 76° W	S 81° W	28	18	189	190	Kurrachee.
·278	·300	·263	·280	−·004	69	30	23	41	− 1	0·8	1·1	1·0	+0·2	4	9	6	1	...	...	5	11	24	N 44° W	N 13° W	62	41	49	71	Jeypore.
·313	·400	·443	·384	+·080	78	43	37	53	+ 8	0·5	0·8	0·7	− 0·1	1	11	14	1	6	8	6	9	4	N 6° W	N 32° E	12	10	48	35	Ajmere.
·211	·192	·196	·215	−·015	42	24	24	33	− 4	0·4	0·6	0·5	−0·6	...	9	30	6	5	...	1	3	6	N 37° E	N 73° E	63	20	87	88	Mount Abu.
·191	·234	·241	·222	+·025	63	49	53	55	0	0·2	1·2	0·7	−0·8	8	2	2	4	2	5	12	25	...	S 67° W	S 55° W	48	28	84	109	Chakrata.
·201	·284	·317	·268	+·023	59	58	56	58	− 1	0·6	1·0	0·8	−0·4	23	1	...	2	3	5	25	1	...	S 32° W	S 52° W	47	35	41	31	Ranikhet.
·248	·344	·288	·293	+·024	72	64	41	59	0	0·7	1·1	0·9	−0·6	25	...	...	5	1	3	26	...	...	S 30° W	S 19° E	43	35	50	42	Pithoragarh.
·342	·390	·399	·377	?	85	56	53	65	?	0·5	1·1	0·8	−0·3	9	4	1	8	5	16	5	8	2	S 2° W	N 76° W	29	18	37	41	Dehra.
·344	·436	·418	·400	+·064	87	59	46	64	+ 7	0·5	0·8	0·7	− 0·1	25	1	2	...	10	5	3	6	8	S 41° W	S 36° W	13	28	15	27	Roorkee.
·381	·412	·419	·404	+·075	95	57	45	66	+11	0·5	0	0·3	−0·3	40	1	1	1	...	...	...	14	3	N 75° W	N 50° W	25	46	21	31	Meerut.
·359	·390	·401	·383	+·073	79	44	36	53	+ 9	0·2	0·1	0·2	− 0·3		6	4	...	6	3	4	...	37	N 41° W	N 81° W	55	36	58	60	Agra.
·392	·478	·440	·437	+·084	93	58	42	64	+10	0	0	0	−0·9	9	9	3	4	1	1	3	15	15	N 50° W	N 45° W	45	46	43	34	Lucknow.
·395	·454	·389	·413	+·004	88	52	35	58	− 5	0·3	0·2	0·3	−0·8	12	7	8	5	1	1	2	9	15	N 26° W	N 65° W	37	21	32	33	Allahabad.
·423	·491	·409	·441	+·016	83	51	38	58	+ 2	0·6	0·8	0·7	−0·5	25	2	4	4	3	2	4	8	6	N 69° W	S 83° W	14	32	26	23	Ghazipur.
·384	·397	·369	·383	+·058	95	50	38	61	− 1	0·4	0·1	0·3	−0·9	5	12	4	3	...	...	2	21	13	N 49° W	N 10° W	57	32	25	25	Nowgong.
·375	·396	·359	·377	+·080	91	45	36	57	+11	0·2	0·1	0·1	−1·1	2	33	3	3	3	...	1	4	11	N 7° W	N 21° W	68	33	72	81	Sutna.
·493	·562	·509	·521	−·013	93	61	47	67	− 3	0·3	0·4	0·4	−0·4	18	5	8	5	2	1	2	9	10	N 21° W	S 79° W	25	55	33	45	Durbhunga.
·454	·497	·478	·476	+·016	82	53	45	60	− 2	1·1	1·0	1·0	−0·7	2	3	5	18	1	...	1	14	16	N 13° W	N 64° W	28	29	54	36	Patna.
·384	·390	·371	·381	+·028	75	47	41	54	+ 1	3·1	3·2	3·2	+0·8	...	16	14	12	3	...	1	2	12	N 22° E	N 42° W	57	55	130	104	Hazaribagh.
·190	·251	·285	·245	−·022	68	62	71	68	−12	2·8	3·9	3·2	−1·0	16	3	8	8	0	0	6	12	2	N 35° W	N 61° W	12	8	82	40	Darjeeling.
									Imperfect															?		?	?	?	Pedong.
·551	·629	·575	·585	+·023	88	70	56	72	− 2	2·0	2·4	2·2	−0·4	3	26	4	8	1	...	1	4	13	N 4° W	N 25° W	62	54	46	40	Berhampore.
·543	·526	·484	·518	−·029	87	55	46	63	− 5	1·8	2·6	2·2	−0·5	7	35	7	7	1	...	...	1	2	N 14° E	N 7° W	70	69	52	45	Burdwan.
·560	·592	·552	·568	−·024	90	63	52	68	− 7	1·7	2·7	2·2	−0·5	...	25	13	7	1	1	2	...	11	N 11° E	N 17° W	65	58	82	68	Calcutta (Alipore).
·578	·624	?	?	?	91	63	?	?	?												Not recorded					?	?		Calcutta (Chowringhee).
·598	·683	·654	·646	+·007	86	71	64	74	− 1	3·8	4·3	4·0	+1·2	...	29	12	2	...	2	3	3	9	N 2° W	N 5° E	67	58	213	154	Saugor Island.
·571	·672	·621	·621	−·008	89	70	57	72	0	2·6	3·7	3·1	+0·9	...	15	20	2	1	8	6	2	6	N 17° E	N 17° W	35	38	85	46	Dacca.
·636	·769	·735	·711	+·022	94	76	70	80	+ 1	4·9	4·9	4·9	+2·0	17	3	12	12	1	1	5	1	8	N 43° E	N 20° W	27	53	39	73	Chittagong.
?	?	?	?	?	?	?	?	?	?	2·1	2·2	2·2	+0·8	5	...	...	1	12	10	26	5	1	S 22° W	N 59° W	65	34	?	?	Demagiri.
?	·541	·600	?	?	?	67	64	?	?	3·0	2·8	2·9	− 0·6	...	2	3	18	1	14	19	2	1	S 12° E	S 17° E	40	47	?	?	Tura.
·535	·602	·597	·578	−·038	93	76	60	76	0	1·8	1·4	1·6	+0·2	3	...	25	30	2	...	...	...	...	N 72° E	N 47° E	87	46	206	118	Dhubri.
·499	·593	632	·575	−·014	99	80	69	83	− 1	5·2	4·2	4·7	+0·2	...	...	40	15	1	1	2	...	1	N 58° E	N 62° E	82	69	41	39	Sibsagar.

Table

Abstract of Observations recorded at 10 A.M. and 4 P.M. at 89 Stations

Station.	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 to 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.
Silchar	29·914	29·790	·123	29·848	−·025	29·906	86·5	63·1	23·4	92·5	57·4	35·1	78·3	83·5	73·4	+0·7	61·4	70·2	72·2	67·9
False Point	·982	·866	·116	·923	−·049	·886	80·6	67·9	12·7	85·4	63·0	22·4	76·9	79·1	73·5	+0·4	66·9	69·9	70·3	69·0
Cuttack	·919	·817	·102	·867	−·039	·892	84·9	65·6	19·3	87·4	60·8	26·6	79·6	82·7	75·0	+0·4	64·2	68·7	69·3	67·4
Sambalpur	·532	·417	·115	·474	−·007	·894	84·7	62·5	22·2	89·8	56·5	33·3	78·3	82·2	73·5	+0·5	60·3	68·7	68·8	65·8
Raipur	·045	28·928	·117	28·983	−·009	·911	83·3	60·8	22·4	87·5	54·3	33·2	77·8	81·4	72·5	+0·9	56·8	64·4	64·5	61·7
Khandwa	28·983	·876	·106	·926	+·011	·955	85·2	51·7	33·4	88·7	46·1	42·6	78·0	83·7	68·1	−1·8	48·6	61·5	62·5	57·6
Hoshangabad	29·035	·908	·126	·968	+·005	·973	83·6	55·8	27·8	86·3	50·3	36·0	73·5	82·4	69·4	−1·1	51·3	61·4	63·8	58·8
Saugor	28·266	·164	·102	·211	+·004	·964	82·8	54·6	28·2	86·1	50·3	35·8	75·6	81·2	68·3	−0·8	51·2	61·1	63·2	58·5
Jubbulpore	·703	·589	·114	·642	0	·965	81·2	51·9	29·3	84·5	45·9	38·6	72·5	79·7	66·2	−0·2	51·0	62·2	62·7	58·6
Pachmarhi	26·590	26·512	·078	26·547	+·005	?	73·1	49·0	24·1	77·3	43·3	34·0	68·9	69·4	60·9	+1·0	45·2	54·9	55·8	52·0
Seoni	27·985	27 878	·107	27·928	−·015	·941	81·0	52·3	28·7	85·1	47·0	38·1	74·6	78·7	66·9	+0·5	49·4	61·2	61·3	57·0
Nagpur	28·988	28·866	·123	28·923	−·010	·922	84·5	59·5	25·0	88·3	54·5	33·8	77·7	82·6	72·4	0	53·9	64·6	65·8	61·5
Chanda	29·400	29·275	·124	29·334	+·006	·930	84·8	57·0	27·8	89·0	50·5	38·5	76·9	83·2	71·4	−0·4	55·9	65·6	66·6	62·7
Sironcha	·616	·493	·123	·551	−·018	·904	87·2	62·5	24·7	91·4	56·3	35·1	78·1	84·7	75·2	0	59·8	67·9	68·8	65·5
Chikalda	26·453	26·358	·095	26·402	+·005	?	74·1	59·0	15·1	78·3	55·0	23·3	70·0	71·5	66·7	+0·2	51·2	56·9	57·8	55·3
Buldana	27·887	27·778	·109	27·828	−·002	·922	81·4	61·4	20·1	84·9	57·4	27·5	77·3	79·9	71·9	−0·1	53·1	60·4	60·3	57·9
Akola	29·106	28·973	·133	29·035	+·008	·938	87·0	53·5	33·5	90·3	48·1	42·2	78·5	85·9	71·1	−0·7	51·0	63·4	65·3	59·9
Makhla			Not recorded.				77·7	59·4	18·3	80·6	54·4	26·2	70·6	73·9	68·5	+0·9	53·5	59·7	61·6	58·3
Deesa	29·568	29·461	·108	29·507	−·002	·934	95·1	58·4	36·7	98·9	50·4	48·5	86·4	92·7	76·5	+2·9	48·9	61·4	63·3	57·9
Bombay	·973	·857	·116	·909	0	·886	87·8	73·6	14·2	92·0	69·0	23·0	80·5	84·1	79·6	+0·6	67·5	70·2	73·7	70·5
Poona	28·173	28·044	·129	28·111	+·012	·912	88·6	56·8	31·8	91·0	49·5	41·5	80·6	86·9	72·6	+0·5	52·7	60·7	62·1	58·5
Sholapur	·420	·283	·136	·349	+·011	·901	89·4	59·5	29·9	93·5	52·3	41·2	82·1	87·6	73·6	0	53·6	64·2	64·5	60·8
Ratnagiri	29·856	29·751	·105	29·797	+·003	·845	92·7	68·0	24·6	96·5	62·9	33·6	89·5	86·2	78·4	−0·3	63·1	69·7	73·8	68·9
Karwar	·927	·819	·108	·867	+·011	·843	89·0	66·8	22·2	91·3	61·0	30·3	80·2	85·5	77·0	−0·1	66·1	70·8	74·6	70·5
Belgaum	27·456	27·342	·114	27·394	−·001	855	83·0	59·3	23·7	85·1	51·9	33·2	76·9	82·0	70·8	+0·1	56·1	62·8	63·8	60·9
Secunderabad	28·213	28·095	·122	28·154	+·010	·901	86·8	60·7	26·2	91·4	53·1	38·3	79·0	87·2	73·4	+1·0	57·3	66·0	67·2	63·4
Vizagapatam	29·964	29·851	·113	29·903	−·025	·872	84·2	76·1	8·2	87·0	71·0	16·0	82·6	83·9	82·3	+3·1	67·2	70·1	71·9	69·7
Bellary	28·508	28·380	·128	28·442	+·001	·868	88·9	65·1	23·8	94·0	58·4	35·6	81·1	86·4	76·0	+0·7	57·8	67·3	66·9	64·0
Madras*	29·875	29·933	·105	29·915	−·003	·895	86·6	72·2	14·4	89·6	64·1	25·5	84·4	77·3	78·4	+0·2	?	75·3	73·6	73·9
Salem	·062	28·925	·137	28·999	+·002	·880	89·9	68·6	21·3	92·9	60·9	32·0	80·5	86·3	78·5	+2·7	67·7	74·3	74·9	72·2
Mercara	26·263	26·173	·090	26·218	−·049	·870	76·6	59·1	17·5	78·7	53·1	25·6	69·5	72·8	67·4	+0·9	56·5	62·4	64·2	61·0
Trichinopoly	29 716	29·500	·126	29·659	+·002	·847	88·2	72·4	15·8	92·1	67·4	24·7	80·3	84·8	79·1	+0·8	70·6	74·6	75·6	73·6
Cochin	·963	·861	·102	·906	+·010	·844	87·8	73·7	14·1	89·2	69·7	19·5	83·5	84·3	79·9	+0·2	72·6	76·3	76·4	75·1
Wellington	24·306	24·228	·078	24·267	+·028	?	67·3	50·2	17·1	69 8	39 4	30·4	62·9	62·9	58·7	+0·2	48·8	58·4	58·9	55·3
Akyab	29·971	29·866	·105	29·922	−·012	·896	84·0	73·9	10·1	90·2	68 7	21·5	78·9	80·9	79·4	+1·3	68·9	74·5	75·1	72·8
Diamond Island	·931	·826	·105	·877	−·015	·853	85·0	71·6	13·3	89·8	67·3	22·5	81·5	82·4	77·3	−1·7	70·7	75·9	75·7	74·1
Rangoon	·943	·835	·108	·888	−·005	·868	95·7	73·1	22·6	101·2	68·8	32·4	81·0	83·4	80·2	+2·1	71·5	76·0	76·2	74·7
Mergui	·882	·773	·109	·827	+·017	·855	87·3	66·7	20·5	90·1	59·4	30·7	82·2	84·3	76·3	−1·5	65·3	74·8	76·1	72·1
Cocos Island	·844	·755	·088	·799	?	...	84·3	?	?	87·4	?	?	82·4	80·4	?	?	73·4	77·5	76·4	75·8
Port Blair	·868	·766	·102	·816	−·025	·824	86·2	76·7	9·5	90·4	69·6	20·8	83·3	83·2	80·3	−0·2	73·2	79·0	78·3	76·8
Quetta	24·815	24·737	·079	24·766	+·045	?	70·5	35·5	35·0	77·3	27·6	49·7	61·2	66·9	52·1	+5·3	32·0	45·8	47·8	41·9
Leh	19·875	19·764	·111	19·821	+·095	...	50·9	28·5	22·4	58·2	18·0	40·2	37·9	46·6	36·3	+4·1	21·2	28·4	33·7	27·8
Katmandu	25·753	25·660	·093	25·703	0	?	82·0	41·4	40·6	86·8	36·2	50·6	62·3	71·3	59·1	+0·4	40·2	55·3	60·2	51·9
Minicoy	29·970	29·872	·098	29·920	?	·855	85·2	78·1	7·1	89·1	73·4	15·7	82·7	82·8	80·7	?	73·0	76·3	76·1	75·1
Aden	·946	·829	·117	·888	−·021	·915	86·6	75·1	11·5	90·3	70·9	19·4	82·3	83·2	80·0	+1·6	69·8	73·5	73·1	72 2
Perim	·827	·716	·111	·772	?	?	87·3	78·2	9·1	89·1	74 6	14·5	83·6	83·6	81·8	?	57·2	76 0	75·8	69·7
Zanzibar	·998	·884	·114	·941	?	·942	83·8	76·6	7·2	86·1	74·5	11·6	81·0	83·3	80·2	?	73·3	75·9	75·6	74·9

* The hours of observations are 14 hours and 20 hours (in case of winds from the hourly means of anemograph at 12 and 24 hours.

II —*concluded.*

in India, Burma, &c., for November 1891 —concluded.

Vapour Tension.					Humidity.					Cloud.				Wind Direction. Number of Winds from											Wind Steadiness.		Wind Velocity.		Station.
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.	
·527	·633	·642	·601	−·022	91	66	57	71	− 6	3·8	3·5	3·7	+0·3	47	...	3	9	...	...	...	1	...	N 79° E	S 77° E	17	30	75	46	Silchar.
·651	·642	·626	·640	+·015	95	70	63	76	+ 2	3·4	4·1	3·8	+0·2	...	23	18	5	2	1	...	1	10	N 15° E	N 22° E	70	57	201	158	False Point.
·574	·560	·540	·558	−·029	87	55	48	64	− 4	2·3	3·4	2·8	+0·2	4	13	31	2	2	...	1	3	4	N 28° E	N 1° W	67	43	55	41	Cuttack.
·502	·576	·528	·536	−·012	87	59	48	65	− 3	1·4	1·9	1·6	−0·8	...	14	19	...	1	2	5	3	16	N 7° W	N 1° W	55	53	113	39	Sambalpur.
·415	·431	·385	·404	−·040	76	45	36	52	− 7	1·3	2·1	1·7	−0·5	16	12	22	5	...	...	...	1	4	N 29° E	N 31° E	59	57	96	83	Raipur.
·308	·344	·304	·319	−·039	79	36	26	47	− 1	0·2	0	0·1	−1·5	...	20	38	2	...	...	...	...	...	N 32° E	N 63° E	92	55	67	62	Khandwa.
·327	·398	·362	·362	−·023	72	48	38	51	− 2	0·1	0·4	0·3	−1·1	5	7	19	14	3	10	...	...	2	N 71° E	N 60° E	50	66	74	45	Hoshangabad.
·337	·359	·356	·351	+·055	79	41	33	51	+ 8	0·1	0·2	0·2	−0·9	...	14	24	7	7	1	4	1	2	N 45° E	N 20° E	55	47	27	56	Saugor.
·367	·433	·361	·387	+·009	94	54	35	61	+ 5	0·4	0·3	0·4	−1·3	14	12	14	3	4	2	2	1	8	N 20° E	N 47° E	38	25	24	42	Jubbulpore
·263	·272	·292	·276	−·025	73	39	40	51	− 3	0·4	0·5	0·4	−1·6	5	16	14	15	...	...	...	1	9	N 29° E	N 52° E	62	46	65	60	Pachmarhi.
·322	·378	·336	·341	−·009	81	44	35	54	+ 3	0·8	1·1	0·9	−2·8	...	11	29	13	3	1	...	...	3	N 48° E	N 55° E	75	54	22	61	Seoni.
·352	·450	·428	·410	−·001	68	47	38	51	− 2	0·5	0·8	0·6	−2·0	16	19	23	2	...	...	...	...	...	N 27° E	N 60° E	67	60	73	71	Nagpur.
·440	·484	·436	·454	−·052	93	52	38	61	− 5	0·7	1·0	0·9	−1·9	19	8	15	9	2	1	...	...	6	N 39° E	N 62° E	43	48	42	44	Chanda.
·489	·552	·497	·513	−·058	85	57	42	61	− 7	1·4	2·1	1·8	−1·0	31	10	7	1	1	...	1	1	8	N° W	N 7° E	32	58	43	62	Sironcha.
·292	·316	·323	·310	−·057	58	43	41	47	− 9	1·0	0·9	0·9	−1·2	21	19	4	2	...	1	3	...	10	N 10° W	N 6° W	43	21	91	114	Chikalda.
·307	·320	·281	·312	−·093	55	34	28	39	−12	0·4	0·4	0·4	−2·1	1	16	23	16	3	...	...	...	1	N 48° E	N 69° E	77	59	101	119	Buldana.
·338	·384	·351	·369	−·028	80	39	28	48	− 4	0·7	0·9	0·8	−0·7	10	8	17	15	8	...	...	...	2	N 63° E	N 61° E	59	50	83	82	Akola.
?	?	?	?	?	?	?	?	?	?	1·0	1·2	1·1	−2·1	...	11	14	3	1	6	...	11	14	N 17° W	S 87° W	42	24	?	?	Makhla.
·224	·215	·192	·236	−·043	45	17	13	26	− 8	0·7	1·0	0·9	−0·4	...	5	12	14	9	3	3	3	4	N 78° E	N 33° E	39	31	167	181	Decsa.
·597	·605	·698	·633	−·065	72	58	59	63	− 8	1·0	1·3	1·2	−1·0	...	...	14	13	1	2	...	9	21	N 1° W	N 17° E	33	59	251	238	Bombay.
·357	·291	·254	·323	−·097	75	27	19	39	− 8	1·0	1·4	1·2	−1·6	11	...	11	30	8	...	...	...	...	N 87° E	N 83° E	73	45	147	138	Poona.
·345	·384	·326	·380	−·082	66	34	25	45	− 7	1·2	1·9	1·6	−2·2	...	5	15	27	8	2	...	...	3	N 76° E	N 69° E	70	63	182	191	Sholapur.
·519	·465	·673	·586	−·074	75	33	54	60	− 4	0·9	1·3	1·1	−0·1	...	6	3	15	...	14	...	1	21	N 8° E	N 1° W	15	30	193	203	Ratnagiri.
·624	·637	·717	·667	−·047	92	61	59	71	− 5	1·0	1·2	1·1	−1·4	6	...	21	...	...	...	5	17	11	N 35° W	N 26° W	39	46	52	?	Karwar.
·418	·403	·376	·419	−·048	82	43	35	55	− 3	1·5	2·3	1·9	−1·7	...	6	20	19	6	2	1	...	2	N 68° E	N 84° E	68	67	228	280	Belgaum.
·438	·483	·466	·461	−·025	81	48	40	56	− 5	2·4	2·5	2·4	−0·7	1	8	25	21	1	1	...	...	2	N 56° E	N 53° E	78	75	99	86	Secunderabad.
·552	·631	·665	·616	−·010	61	51	54	55	−11	4·5	3·9	4·2	+0·8	...	24	10	16	2	2	1	1	4	N 34° E	E 75° E	60	56	64	54	Vizagapatam.
·403	·503	·423	·443	−·094	62	47	34	48	−13	3·6	3·8	3·7	−1·0	27	4	8	17	4	...	...	...	...	N 75° E	N 80° E	43	56	18	79	Bellary.
?	·762	·785	·780	+·026	?	64	83	80	0	4·1	4·3	4·2	−1·9	...	30	20	1	2	3	2	...	2	N 19° E	N 61° E	70	49	131	161	Madras.*
·657	·748	·707	·704	+·000	90	68	57	72	+ 1	4·4	6·2	5·3	+0·3	...	...	26	17	...	8	6	1	2	N 75° E	S 65° E	50	22	45	75	Salem.
·426	·486	·500	·471	−·069	81	68	63	70	−13	5·9	6·3	6·1	−0·4	...	2	15	35	2	2	...	2	2	N 76° E	N 61° E	75	49	108	91	Mercara.
·728	·782	·761	·757	+·024	91	76	64	77	+ 1	5·2	5·9	5·6	−1·5	17	2	32	5	1	...	...	2	1	N 46° E	N 27° E	59	51	77	100	Trichinopoly.
·778	·810	·812	·800	−·009	91	70	70	77	− 3	2·6	3·8	3·2	−1·4	13	1	14	1	1	...	4	14	12	N 41° W	S 49° W	35	24	80	?	Cochin.
·338	·448	·458	·415	+·001	91	79	80	83	0	6·1	6·3	6·2	−0·7	2	5	2	8	17	23	2	...	1	S 33° E	S 41° E	59	53	49	59	Wellington.
·633	·801	·797	·750	−·010	74	81	76	76	− 4	4·3	4·2	4·3	+1·0	...	10	28	3	...	5	3	5	6	N 23° E	N 6° W	48	29	71	55	Akyab.
·742	·824	·799	·737	−·023	95	77	72	81	+ 1	5·5	5·9	5·7	+1·2	2	5	14	24	8	4	1	...	2	N 81° E	N 59° E	63	64	256	202	Diamond Island.
·755	·835	·810	·803	+·004	92	79	71	81	+ 2	4·2	4·6	4·4	−0·2	...	1	17	23	10	5	3	1	...	S 88° E	N 57° E	65	56	94	103	Rangoon.
·608	·768	·794	·724	−·061	92	70	67	76	− 4	4·4	5·5	5·0	−0·5	...	11	14	13	11	3	5	...	3	N 71° E	N 28° E	43	42	49	37	Mergui.
?	·882	·859	?	?	?	80	83	?	?	6·7	7·2	7·0	?	...	15	18	2	15	8	1	1	...	N 70° E	?	42	...	?	?	Cocos Island.
·776	·935	·907	·872	−·013	84	82	80	82	− 2	6·6	6·7	6·7	+1·7	...	2	6	5	18	13	6	4	2	S 29° E	N 63° E	46	53	246	165	Port Blair.
·149	·153	·137	·146	−·003	72	28	21	40	− 8	1·1	1·8	1·5	+0·5	60	...	...	...	...	...	...	...	...	?	N 41° W	?	46	3	62	Quetta.
·105	·081	·083	·090	+·007	88	36	27	50	+ 1	2·7	3·1	3·3	−0·6	17	...	...	1	3	8	20	9	2	S 44° W	S 4° W	52	24	9	48	Leh.
·242	·361	·397	·334	−·001	92	64	52	69	− 2	1·7	2·4	2·1	+0·1	3	6	1	15	...	4	...	31	...	N 79° W	N 86° W	27	73	17	?	Katmandu.
·747	·824	·813	·795	?	78	74	73	75	?	4·1	5·1	4·6	?	...	13	8	3	2	4	13	4	14	N 41° E	?	33	?	204	?	Minicoy.
·663	·711	·682	·685	+·033	76	65	60	67	0	2·4	1·4	1·9	−0·3	7	...	13	18	10	10	...	...	2	S 79° E	E	55	65	316	283	Aden.
·193	·798	·788	·593	?	20	69	68	52	?	1·5	2·0	1·8	?	...	...	4	5	47	3	...	...	1	S 51° E	?	87	?	471	?	Perim.
·777	·828	·782	·745	?	85	78	69	77	?	8·3	4·1	6·2	?	...	2	5	4	7	16	15	2	3	S 5° W	S 6° W	44	9	?	103	Zanzibar.

*and the means are as given in the registers sent by the Government Astronomer, Madras.

GOVERNMENT OF INDIA CENTRAL PRINTING OFFICE.—No. 117 METEO.—31-5-92.—400.

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.

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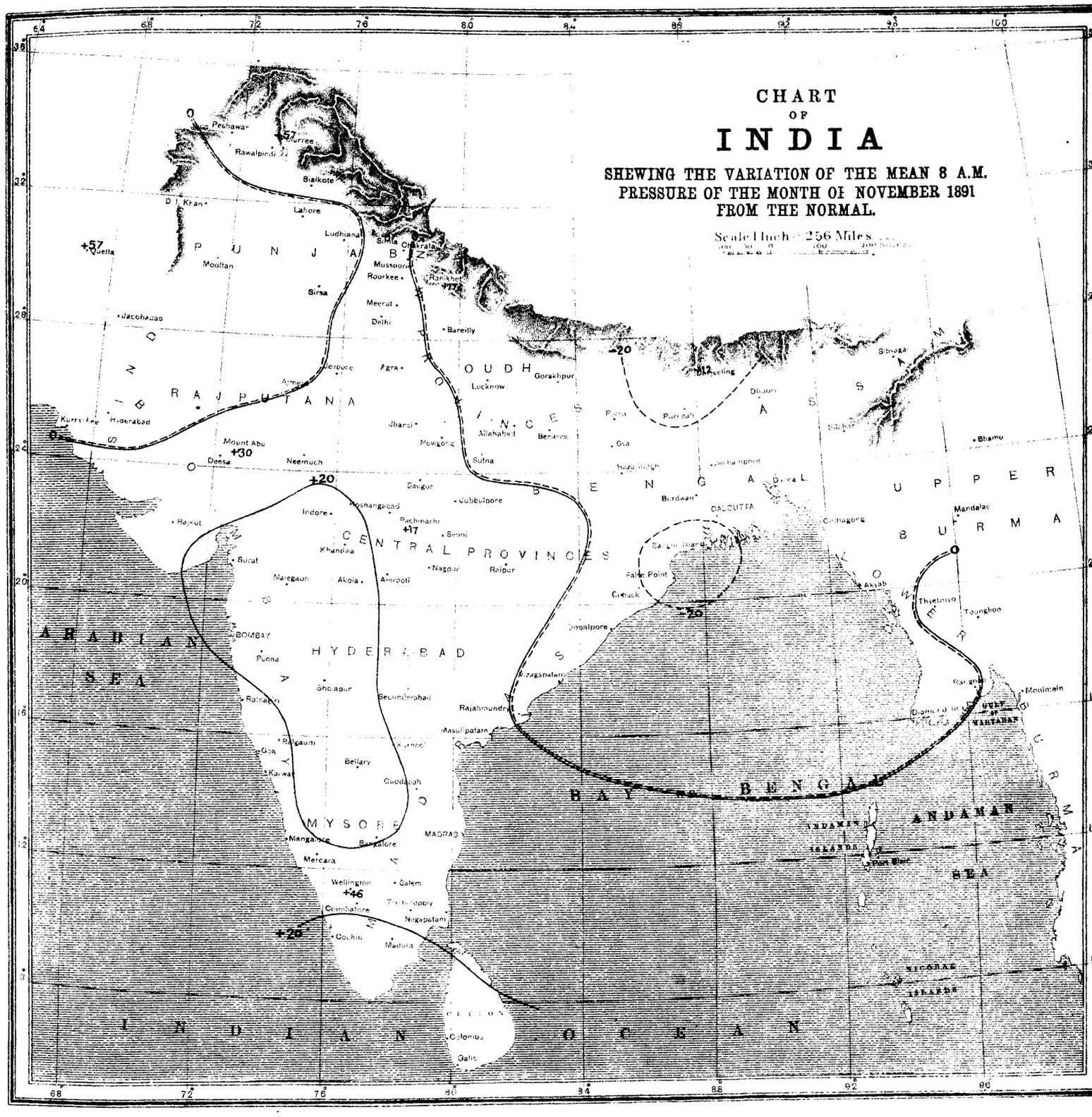
Litho., S. I. O., Calcutta.



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.

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Litho., S. I. O., Calcutta.

or the resultant; a length of ⅕th of an inch being equal to 100 per ce

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

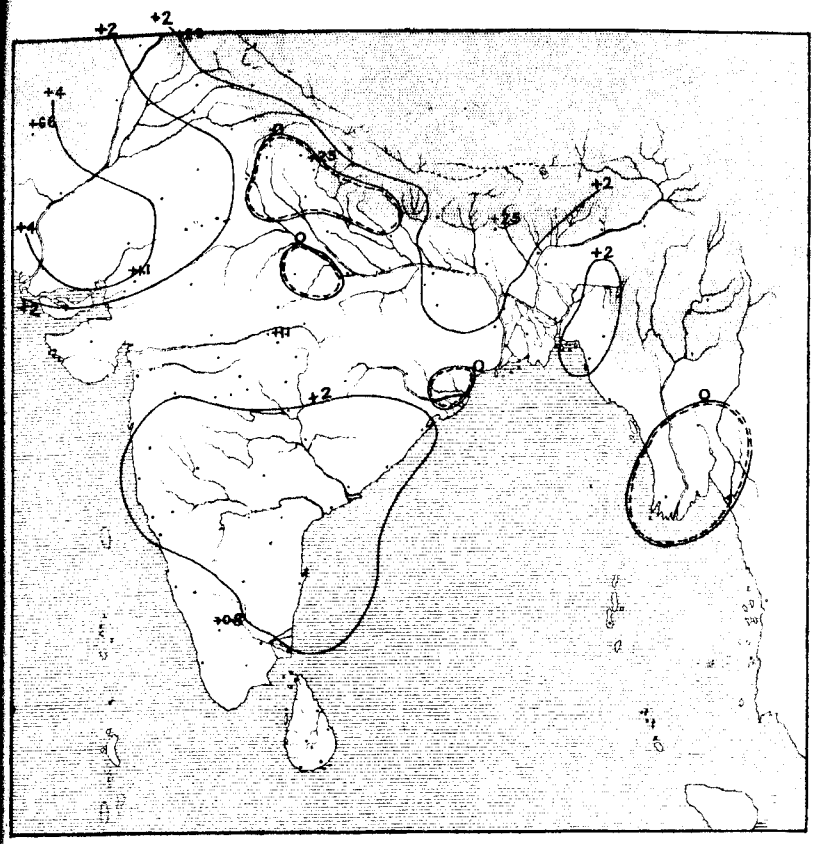
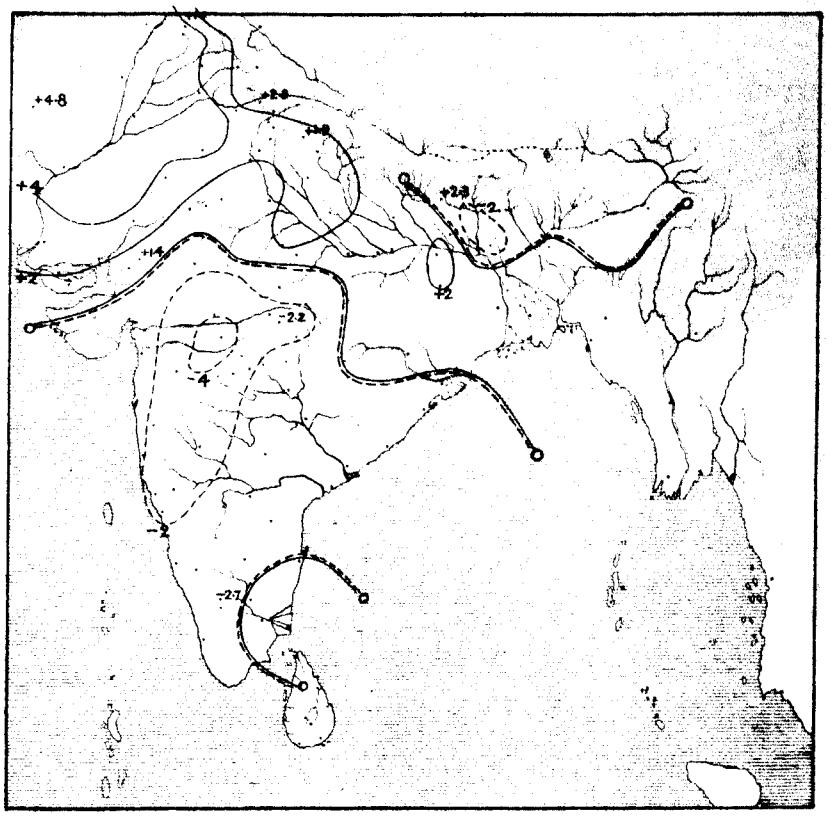


CHART SHEWING THE VARIATION OF THE MEAN MINIMUM TEMPERATURE OF THE MONTH FROM THE NORMAL.



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.

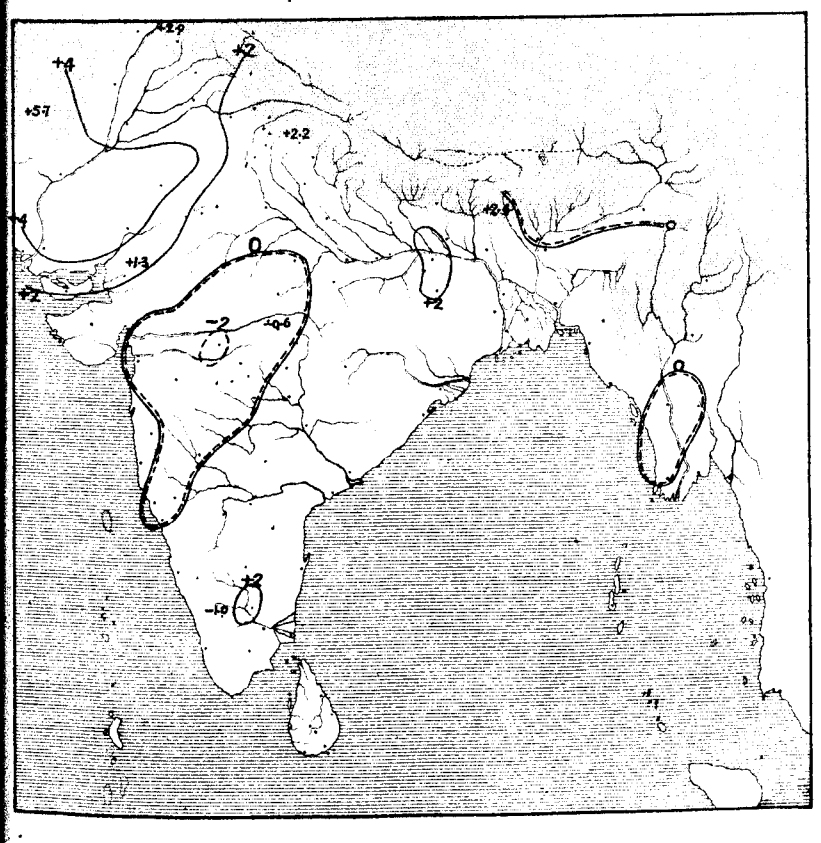
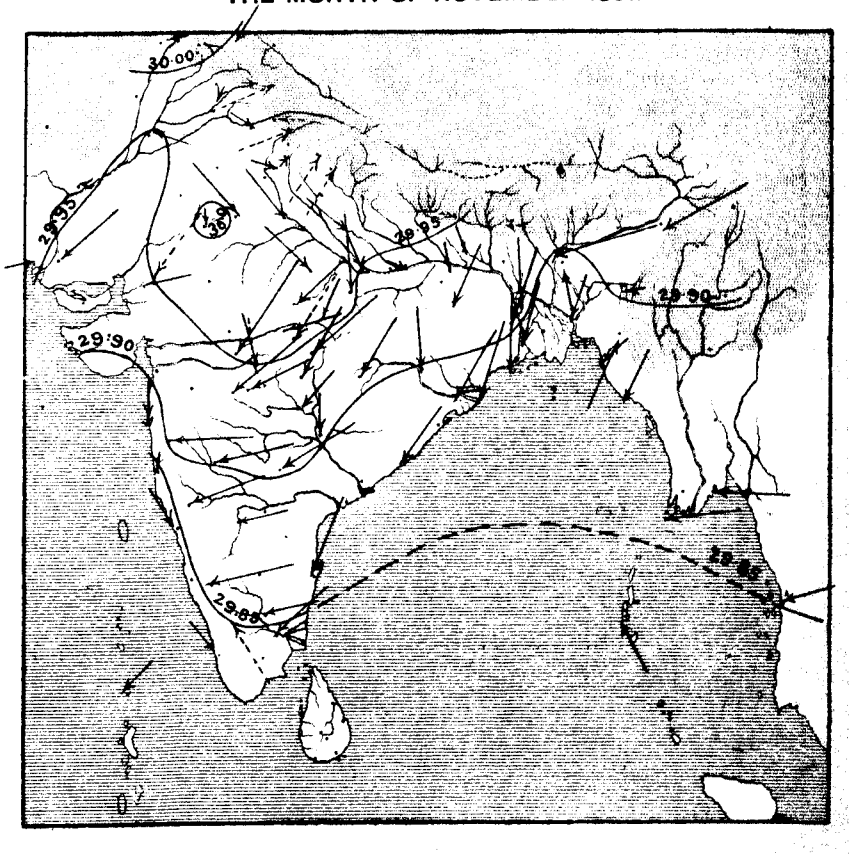


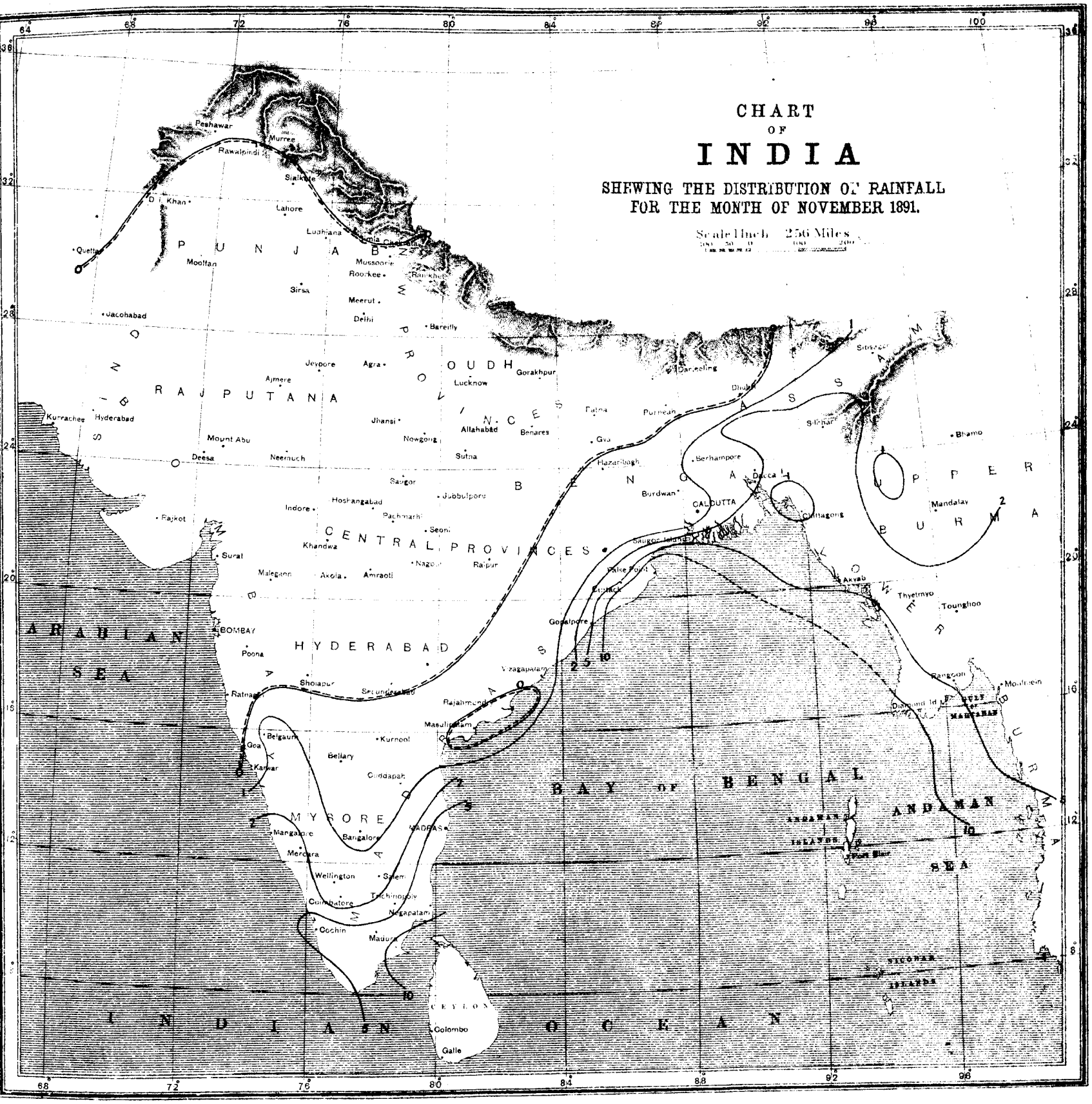
CHART SHEWING THE MEAN DISTRIBUTION OF PRESSURE AND THE RESULTANT WIND DIRECTIONS IN THE MONTH OF NOVEMBER 1891.



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. 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.

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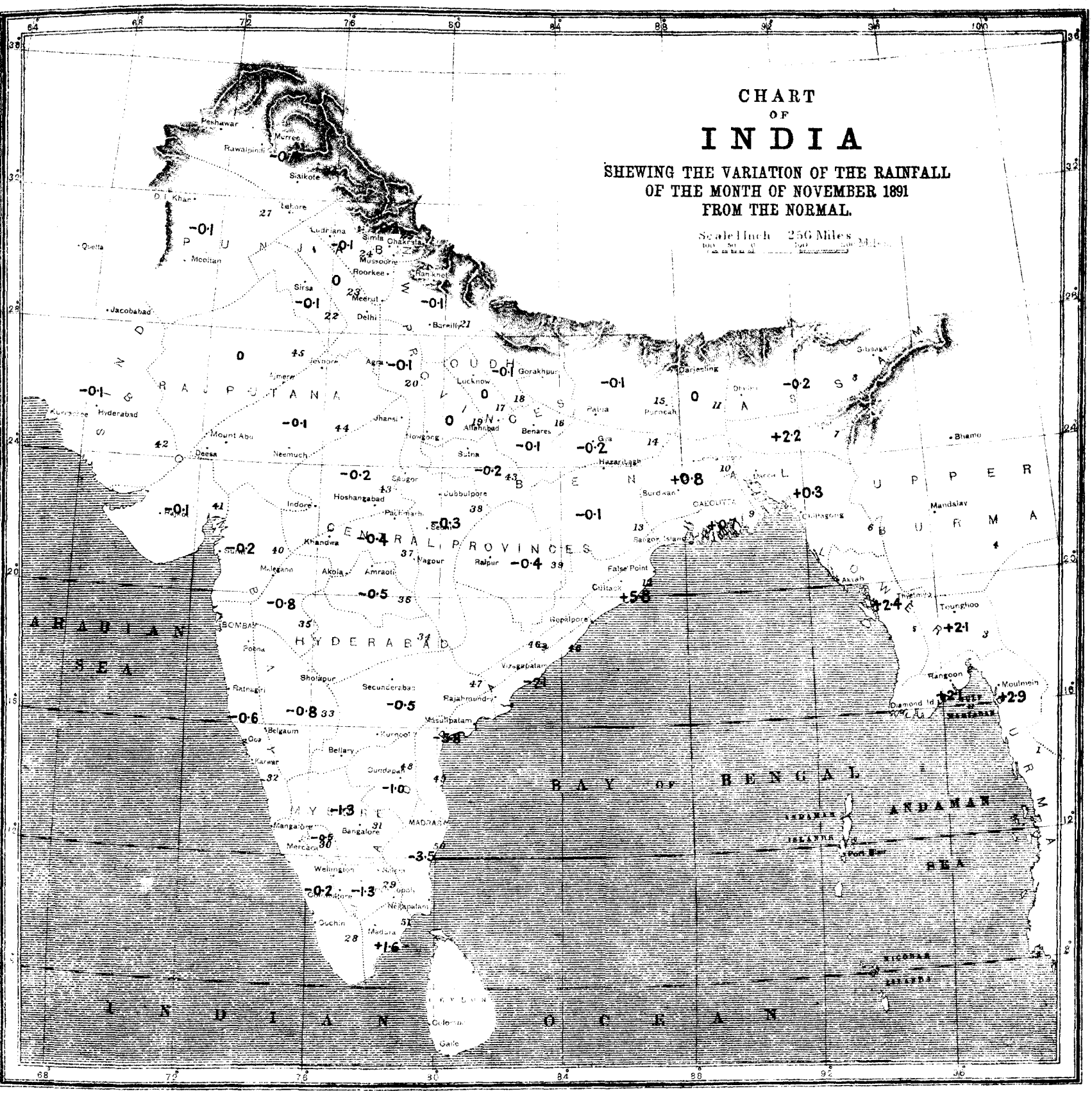

Explanation.

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 51 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 name of the districts 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	14. Behar (South)	27. Punjab (West)	40. Guzerat
2. Lower Burma	15. Do. (North)	28. Malabar	41. Kattiawar
3. Central do.	16. North Western Provinces (East)	29. Madras (South Central)	42. Sind
4. Upper do.	17. Oudh (South)	30. Coorg	43. Central India (East)
5. Arakan	18. Do. (North)	31. Mysore	44. Rajputana (East) Central India (West)
6. Eastern Bengal	19. North Western Provinces (Central)	32. Konkan	45. Rajputana (West))
7. Assam (Surma)	20. Do. do. (West)	33. Bombay Deccan	46. East Coast (North)
8. Do. (Brahmaputra)	21. Do. do. (Submontane)	34. Hyderabad (North)	46(a.) Do. do. (a)
9. Deltaic Bengal	22. Punjab (South)	35. Khandeish	47. Hyderabad (South)
10. Central do.	23. Do. (Central)	36. Berar	48. Madras (Central)
11. North do.	24. Do. (Submontane)	37. Central Provinces (West)	49. East Coast (Central)
12. Orissa	25. Do. (Hill Districts)	38. Do. (Central)	50. East Coast (South)
13. Chota Nagpore	26. Do. (North West)	39. Do. (East)	51. Madras (South)

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GOVERNMENT OF INDIA.

METEOROLOGICAL DEPARTMENT.

MONTHLY WEATHER REVIEW.

PUBLISHED BY ORDER OF

THE GOVERNMENT OF INDIA.

CALCUTTA, DECEMBER, 1891.

INTRODUCTION.

THIS review of the weather in India during the month of December, 1891, is based on observations taken daily at 8 A.M. at 168 stations, and on additional observations taken at 10 A.M. and 4 P.M. at 91 stations. The rainfall summary is based on the rainfall data of the meteorological observatories and the weekly rainfall telegrams sent to Simla by District Officers throughout India. The meteorological data of the Bay of Bengal and the Arabian sea, which are collected at the Ports of Calcutta and Bombay are also used, so far as is at present possible, in discussing the weather of India.

Summary of the chief features of the weather in India during the month of December, 1891.

The most important feature in the meteorology of the month of December is the final withdrawal of south-west humid winds from the south of the Bay and the extension of 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 to 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, Tinnevelly 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 apparently originate sometimes in Beluchistan and Persia, and sometimes in North-western India itself. 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 in the hill districts. They usually march in an easterly direction across Northern India. When they enter India from Beluchistan, they occasionally give rise to the formation of secondary or subsidiary depressions in the Punjab. These subsidiary storms are occasionally much deeper and more intense than the primary storms, and give very stormy rainy weather in the Punjab and heavy snow in the hills.

The ordinary features of the weather are the same as those of November over by far the greater part of the country. As a rule, fine weather with light winds and clear skies obtain. Pressure is, generally, highest in the Punjab

and Central Rajputana and in Upper Assam at the eastern extremity of the Himalayas. It is lowest in the south of the Bay and the south-east of the Arabian Sea, and the range of pressure averages a quarter of an inch.

In December 1891, the mean pressure of the whole of India was ·041″ in excess of the normal.

Relative to this general condition, pressure was in slight excess over the whole of Northern and Central India and the Deccan. This increased pressure was most marked in the area represented by Indore, Khandwa and Sholapur. It was in local defect in Burma and Southern India. The local deficiency was largish in South Madras, and probably the whole of the south of the Bay, in which it ranged from ·02″ to ·04″.

The month was even more free from disturbance than usual in Upper India and the barometric movements and oscillations throughout the month were of little importance. A noteworthy feature of the month was that, although pressure was largely in excess in Upper India, temperature was also considerably above the normal. As usually happens under these conditions, pressure at the hill stations was even more largely in excess than at the neighbouring plain stations.

At the commencement of the month, the chief feature in the distribution of pressure was a broad belt of low pressure, which stretched across from the Coromandel coast to the Andamans and Nicobars. Weather was very squally in this area. This belt was at that time apparently deepest in about Long. 90° E., but the central area of minimum pressure shifted its position irregularly from day to day. When it was near the Coromandel coast the South Madras coast districts received more or less general rain, and when it was transferred eastwards the rainfall diminished in amount. The logs of vessels crossing it showed that winds were remarkably unsteady and changeable, and, occasionally, terrific squalls and heavy downpours of rain were experienced. This trough maintained its position and character until about the 20th, when it shifted southwards and was absorbed in the equatorial belt of low pressure before the end of the month.

The temperature conditions of the month were largely modified by the absence of cold weather storms in Upper India and by the deficient rainfall over the greater part of Madras.

Temperature was very considerably above the average at the commencement of the month, the excess being greatest in the Central Provinces, Berar and Central India. A moderate reduction occurred between the 9th and 11th, almost certainly due to conditions on the north-west frontier, as it commenced in Beluchistan and Sind on the 8th and gradually extended eastwards across Northern and Central India. On the 12th and following days temperature increased over Northern and Central India, and on the 19th was more or less above the normal, the excess being greatest in East Bengal and Rajputana. On the 21st it was most largely in excess in the Deccan, over a large portion of which it was 8° or more in excess of the normal on the 22nd and 23rd A cool wave appeared on the north-west frontier on the 22nd and gradually advanced across Northern and Central India. The cool wave reduced temperature in the Central Provinces and Berar to 4° below the normal on the 28th and 29th. Temperature again increased rapidly on the north-west frontier on the 28th, and this warm wave passed across Northern India on the 30th and 31st. Temperature remained very low on these days in the Central Provinces and the Deccan, chiefly due to the unusually low night temperature. Thus, on the night of the 30th the mean minimum temperature of the Central Provinces averaged 6° below the normal, whilst the day temperature was practically normal.

The changes of temperature from day to day during the month, although considerable, were not as large as usual.

The mean day temperature of the month was above the normal over the whole of India. The excess was greatest in Bengal, Rajputana, the North Punjab and the Peninsula between the parallels of 12° and 19° N. Lat. The mean night temperature was also above the normal over the greater part of the country. It was in moderate defect in Berar, the Central Provinces, the North-Western Provinces and the Punjab.

The mean temperature of the month was above the normal over the whole of India, except the Central Provinces, Berar, Khandeish and the eastern districts of Central India, where it was slightly in defect, due to low night temperature. The increased temperature was most marked in East Bengal, the Deccan, Central Madras and West Rajputana, where it exceeded 2°. The increase was greatest at Vizagapatam (+4·2°) and Masulipatam (+3·0°) in the Circars area of drought, and at Deesa in West Rajputana (+3·6°).

The following table gives a summary of the temperature data of the month for the eleven meteorological provinces of India :—

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

The mean air movement of the month differed in some important respects from the normal. This accompanied and was due to two important variations of the pressure conditions from the normal. The first was a local excess of pressure in the Deccan, Berar and part of Central India and the Central Provinces; and the second, a local deficiency of pressure in the south of the Bay. Gradients were hence slightly steeper than usual in the Bay, and the north-east winds of the month in the north and centre of the Bay were above their normal strength. Winds were also unusually steady in the Gangetic Plain. In the Peninsula, and more especially in Madras, winds were more northerly and less easterly than usual, and hence were drier than usual and gave little rain except in the more southern districts of Madras. The influence of the low pressure conditions in the south-east of the Bay was strongly shown by the continuance of south-east winds at Port Blair until nearly the end of the month (at least a fortnight later than usual) and by the persistent squally weather in that part of the Bay throughout the month.

The air was much drier than usual over the whole of Northern and Central India. This was in part due to increased temperature and in part to a deficiency in the amount of aqueous vapour present in the air. This deficiency was very marked in Sind, Rajputana, Bengal and the Peninsula excepting in Southern India. It was also very large at the hill stations in Upper India and at Quetta in Beluchistan.

As already stated, the month was even more free from disturbed weather than usual over nearly the whole of India. South Madras received frequent rain, but to the north of Lat. 16° N., the weather was fine and skies clear or lightly clouded throughout the month. Hence the mean cloud amount was small and more or less below the normal in all districts except South Madras. On the other hand, weather was disturbed with frequent rain in the south-east of the Bay, and the cloud amount of that area (as represented by Nancowry and Port Blair) was considerably in excess. The following table gives the mean variations of the aqueous vapour pressure, humidity and amount of cloud in the meteorological provinces of India for December 1891:—

Province.	Mean Variation of		
	Aqueous Vapour pressure from normal.	Humidity from normal.	Cloud amount from normal.
	"	%	
Burma Coast and Bay Islands	—·008	0	+1·2
Assam	—·005	—4	—0·6
Bengal and Orissa	—·009	—7	+0·5
Gangetic Plain and Chota Nagpur	+·007	—2	—0·6
Upper Sub-Himalayas	—·005	0	—0·2
Indus Valley and North-west Rajputana	—·019	—6	+0·8
East Rajputana, Central India and Guzerat	—·015	—3	+0·1
Deccan	—·039	—4	—0·9
West Coast	—·027	—7	—0·7
Southern India	+0·27	—1	+0·8

The month is usually a dry one over the greater part of India. The only area which, as a rule, receives moderate to heavy rain is the south of the Peninsula, more especially the coast districts between Madras and Negapatam. December, 1891, was even drier than usual over by far the greater part of the country. The whole of Northern India, Central India, the Deccan and Mysore received practically no rain. Burma had some light showers of very little importance on the 9th, 10th and 11th. Madras, as a whole, received an average amount differing little from the normal average, but the rainfall was very irregularly and unequally distributed. Thus the northern coast districts of Ganjam, Vizagapatam, Godavari and Kistna, and the Deccan districts of Bellary, Anantapur and Kurnool received absolutely or practically no rain. The rainfall of the previous two months had been unusually scanty and hence the drought which commenced in October lasted until the end of the period of the retreating south-west monsoon.

The rainfall was in excess in the southern coast districts, including Chingleput, North and South Arcot, Tanjore and Trichinopoly. The excess was moderate in amount except in the Tanjore and South Arcot districts. Tanjore received an average of 16·83 inches or more than double its normal average.

In the remaining districts the rainfall of the month was in slight to moderate defect, the deficiency being greatest relatively to the normal in the Cuddapah and Salem districts.

The following table gives a summary of the rainfall data for the eleven meteorological provinces:—

Meteorological Province.	Average actual rainfall of month.	Average normal rainfall of month.	Variation from normal.
	Inches.	Inches.	Inches.
Burma Coast	2·09	1·06	+1·03
Burma, Inland	0·11	0·22	—0·11
Assam	0	0·55	—0·55
Bengal and Orissa	0·01	0·33	—0·31
Gangetic Plain and Chota Nagpur	0	0·23	—0·23
Upper Sub-Himalayas	0	0·43	—0·43
Indus Valley and North-west Rajputana	0	0·09	—0·09
Rajputana, Central India and Guzerat	0	0·21	—0·21
Deccan	0·02	0·57	—0·56
West Coast	1·63	0·77	—0·09
South India	3·85	2·71	+0·66

Atmospheric Pressure.

The distribution of mean 8 A.M. pressure for December is shown by means of two charts. The first chart (Plate I) gives the distribution of the mean pressure of the month reduced to sea-level and to constant gravity (that of latitude 45°) by means of isobars drawn for differences of pressure of ·05″ or $\frac{1}{20}$th of an inch. The second chart (Plate II) gives the variations of the actual mean pressure from the normal pressure. These values are obtained from the barometric readings reduced for temperature only. A small chart, No. 4, of Plate III, gives the distribution of the monthly mean daily pressure and of the mean winds in the same form and manner as in the monthly charts given hitherto in annual reports on the meteorology of India. The data on which this chart is based are given in Table II. The pressure data used in this chart are, it should be noted, reduced to constant gravity (that of 45° lat.) as well as to sea-level.

The more important barometric changes and movements during the month are fully described in the following statement of the barometric depressions of the month. The data that are chiefly used in this discussion are the 8 A.M. reduced observations and the variations derived from a comparison of these observations and the normal values given in Table I. The means in the third column are not only reduced or corrected to sea-level but also to constant gravity. The normal means are obtained from the observations of the period 1878—88, and in order that the means and variations may be strictly comparable, the means have been calculated for observations of the same period in all cases.

The pressure of the whole of India for the month was 0·041″ in excess of the normal pressure. Increased pressure in India during the cold weather appears to occur under two entirely different sets of conditions. In the majority of cases it accompanies decreased temperature, and hence represents chiefly a condensation of the atmosphere in the lower strata, and under these conditions the excess at the plains stations is always large compared with that at the hill stations, and sometimes actually accompanies deficiency at the level of the hill stations in Northern India. In some cases increased pressure in India accompanies increased temperature, and the ordinary relation between pressure at the level of the hill stations and plains (stated above) is reversed, that is, the increase of pressure in that case is usually greatest at the level of the hill stations. The latter combination of pressure conditions is much less frequent and more abnormal than the preceding. Whether it indicates an actual accumulation of air or diminished motion in the middle or upper atmospheric strata, superadded to an abnormal distribution of pressure due to increased temperature can only at present be surmised.

The increased pressure conditions of December 1891 belong to the second combination of pressure features, as is shown by the following data—

1st.—Pressure and temperature were both more or less considerably above the normal in every part of India. The following gives data for the chief meteorological divisions:—

Division.	Variation of	
	Mean pressure of month from normal.	Mean temperature of month from normal.
	″	°
Assam	+·036	+0·7
Bengal and Orissa	+·042	+1·5
Gangetic Plains	+·050	+0·7
Upper Sub-Himalayas	+·047	+0·3
Indus Valley and North-West Rajputana	+·040	+1·5
East Rajputana and Central India	+·047	+0·5
Deccan	+·050	+0·4
West Coast	+·022	+1·6
South India	+·027	+2·2

These figures show that there was no simple relation between the increase of temperature and the increase of pressure, and hence that they do not stand in a direct relation of cause and effect.

2nd.—Pressure was more largely in excess at the hill stations than at the neighbouring plain stations, and hence pressure in the middle atmosphere (from 5,000 to 10,000 feet) was undoubtedly more largely in excess than at the level of the plains. The following gives pressure and temperature data for five hill stations and the nearest plain stations:—

Station.	Variation of	
	Mean pressure of month from normal.	Mean temperature of month from normal.
	″	°
Quetta	+·089	+2·6
Jacobabad	+·041	+0·9
Murree	+·059	+2·8
Peshawar	+·045	+2·5
Ranikhet	+·055	+1·0
Bareilly	+·042	+0·6
Pachmarhi	+·060	—0·7
Hoshangabad	+·049	—0·8
Mount Abu	+·057	+1·6
Deesa	+·038	+3·6

These figures show that in every case the variation of mean pressure from the normal at the hill stations was greater than at the neighbouring plain stations and that the temperature was in all cases, except that of Mount Abu and Deesa, more largely in excess at the hill stations than at the plain stations.

North of about Lat. 16° N. the pressure variations of the month were equal to or greater than ·040″. They decreased from Lat. 16° N. to South Madras, in which they were slightly in excess of ·010″. Hence, relatively to the general state, pressure was locally in defect, or the pres-

sure anomalies were negative in Southern India. They exceeded ·025″ at the following stations :—

STATION.	Negative anomaly, December 1891.
	″
Colombo	−·028
Trichinopoly	−·031
Coimbatore	−·028
Calicut	−·033
Karwar	−·027
Goa	−·028

Pressure was locally in slight excess over nearly the whole of Northern and Central India and in the North Deccan. The positive anomalies exceeded ·020″ locally at Khandwa (+·033″), Indore (+·020″), Jubbulpore (+·020″) and Jhansi (+·023″).

One of the more remarkable features of the pressure conditions was the approximate uniformity of the amount of the excess of the pressure over the whole of Northern and Central India.

Barometric Depressions and Cyclonic Storms of the month.

The following gives an account of the most important changes in the distribution of pressure and of the depressions of the month.

At the commencement of the month pressure was in excess by amounts ranging from ·04″ in Northern India to ·08″ in the Deccan and Mysore. Fine dry clear weather obtained over the whole of India except in the south of the Peninsula, which was receiving light to moderate rain. Pressure decreased over the whole Indian area during the next four days, and on the morning of the 5th was generally below the normal in Northern India and above it in the Peninsula, the excess being greatest in South Madras. Rain ceased to fall from the 5th until the 8th in the latter area. During this period pressure increased steadily over the Indian area, the increase being greatest in Upper India.

On the morning of the 8th strongly marked anticyclonic conditions obtained in India, pressure at 8 A.M. ranging from 30·24″ in the Upper Punjab to 29·91″ in Malabar. Gradients were steep in the Peninsula and the northern half of the Bay. Showers recommenced in South Madras on the 9th, and pressure began to give way. The fall was greatest in the south-west of the Bay, off the Coromandel coast, and a depression apparently formed in that area.

Shallow depression in the south of the Bay, off the Coromandel coast, from the 9th to the 15th.—The disturbance is interesting as showing the prevalence for several days of the squally conditions, which invariably form the initial stage in the formation of cyclonic storms in the Bay, to a marked degree. Notwithstanding the presence of these conditions, the squally weather gradually passed away without developing into a storm. On the 7th pressure increased in North-western India and fell elsewhere. Steep gradients favouring the normal winds of the season prevailed in Northern India and the Peninsula and the north of the Bay. On the morning of the 8th, north-easterly winds were blowing over the whole of the Bay to the north of Lat. 8° N. and the observer at Pamben reported that a northerly gale of wind was blowing in Palk's Strait. A broad belt of low pressure stretched from the West Ceylon coast to the Andaman and Nicobar Islands. The barometer fell during the next 24 hours over the whole of India, the fall being greatest in the south-east of the Bay (as indicated by the Port Blair and Nancowry observations.) Moderate north-west winds prevailed on the south Coromandel coast and were giving moderate to heavy rain. Strong south-east to east winds were extending northwards up the Bay to the west of the Nicobars.

The barometric changes on the 9th were small except in the south-east of the Bay, where pressure continued to give way, and on the morning of the 10th the pressure conditions were unchanged except that the broad belt of low pressure was more strongly marked and had widened out in its eastern half. Strong south-east squally winds were now blowing at Port Blair, westerly winds to the west of the Nicobars and easterly winds in the centre of the Bay. The pressure conditions continued unchanged during the next two days, and the South Madras districts continued to receive rain but in diminishing amounts. One vessel, the Port Blair mail steamer *Shahjehan* crossed the low pressure area in the Bay during this period, in her voyage from Madras to Port Blair. The following extracts from her log show clearly the character of the weather in this broad belt of low pressure. She left Madras at 2 P.M. of the 7th and at that time had strong north-east winds with occasional rain squalls :—

Date.	Hour.	POSITION.		BAROMETER (Aneroid.)		WIND.		Weather.
		Lat. North.	Long. East.	Actual.	Corrected.	Direction.	Force.	
8th	8 A.M.	12° 47′	82° 36′	29·96	29·86	NE	6	Cloudy. High sea.
	Noon	12° 44′	83° 04′	30·05(?)	·95(?)	ENE	7	Heavy squalls.
	4 P.M.	...	...	29·93	·83	E	7	Weather clearing a little.
	8 P.M.	...	...	·93	·83	E by S	6	Occasional rain-squalls.
	Mid-night	...	...	·95	·85	SE	6	Frequent heavy rain-squalls.
9th	8 A.M.	12° 30′	84° 57′	·98	·88	ESE	5	Overcast.
	Noon	12° 27′	85° 19′	·97	·87	ENE	6	Fine.
	Mid-night.	...	...	·97	·87	NE	5	Fine and clear.

Date.	Hour.	Position.		Barometer (Aneroid.)		Wind.		Weather.
		Lat. North.	Long. East.	Actual.	Corrected.	Direction.	Force.	
10th .	8 A.M.	12° 6′	87° 54′	29·96	29·85	NE	6	Overcast.
	Noon	12° 2′	88° 24′	·97	·87	NE	6	Cloudy.
	10 P.M.	...	...	...	...	...	...	A furious squall from east passed over the vessel.
	Mid-night.	...	...	...	...	ESE	8	High sea. Moderate gale and overcast.
11th .	8 A.M	...	...	·98	·88	ESE	6	Cloudy and fine.
	Noon	12° 46′	91° 14′	·96	·86	E	4	Fine and clear, and moderate sea.
	6 P.M.	...	...	...	...	...	...	A terrific squall or whirlwind passed to leeward of the steamer; scud travelling in all directions.
	Mid-night.	...	...	·98	·88	ESE	7	Frequent heavy squalls of wind and rain.
12th .	4 A.M.	...	...	·96	·86	NE	6	Heavy rain. Thick dirty weather.
	8 A.M.	...	...	·99	·89	ESE	7	Heavy squalls with continuous rain.
	Noon	At Port Blair		...	...	ESE	7	
	6 P.M.	Left Port Blair for Rangoon.		...	...	E by S	6 to 7	
	Mid-night.	...	...	·97	·87	ESE	6	Fine and clear, with strong steady east south-east breeze.

The preceding extracts show that the barometer was remarkably steady in this area throughout the period from the 8th to the 12th, and that winds were, on the other hand, very unsteady. The *Shahjehan* passed from south-east to north-east winds, and back again to south-east winds, three times during her voyage across from Madras to Port Blair, and had corresponding changes of weather. Thus, after having frequent heavy rain squalls on the evening of the 8th, she had fine weather throughout the 9th. On the evening of the 10th she had a furious squall, followed by a moderate gale, but on the morning of the 11th it was again fine and clear. At 6 P.M. of that day a terrific squall passed near to the vessel and weather moderated as she approached Port Blair. The extracts from her log, in fact, show clearly that, although weather was very disturbed in this broad belt of low pressure,—fine weather alternating with squally weather and heavy rain,—there was no well defined cyclonic circulation with a definite centre at any time during the period. The ship *Sir Robert Fernie*, which crossed the area from south to north in the meridian of 91° E. experienced similar weather. It is sufficient to give the weather noted in her log of the 11th and 12th :—

Date.	Hour.	Position.		Wind.		Weather.
		Lat. North.	Long. East.	Direction.	Force.	
11th .	Noon .	11° 47′	91° 14′	E	5	Squally.
	Midnight	...	...	E	6	Strong breeze with rainy weather.
12th .	8 A.M. .	13° 55′	91° 55′	E	6	Heavy squalls with heavy rain.
	Noon .	14° 20′	92° 3′	E	6	Terrific squalls and heavy rain.
	4 P.M, .	...	...	ESE	5	Thick weather and heavy rain.
	8 P.M. .	...	...	ESE	...	Very unsteady winds with thick rain.
	Midnight	...	...	E by N	...	Very unsteady winds with thick rain.

The Port officer, Negapatam, sent the following account of the weather at that port from the 8th to the 11th December which it is interesting to compare with the weather experienced during the same period by the S.S. *Shahjehan*:—

"On the afternoon of the 8th the weather had a very unsettled appearance; at 6 P.M. the sky became thickly overcast and hard squalls changeable from north to the north-eastward were experienced accompanied by rain. During the night the breeze increased to a smart gale generally from the north-north-eastward, force 7, and on the 9th the gale continued to blow steadily from the same direction with hard squalls from the north-eastward and heavy rain. On the morning of the 10th the wind was moderate, but very changeable, being all round the compass, but hard squalls from the north-eastward accompanied by rain were experienced. The total measured rainfall for the 9th and 10th was about 11 inches. The breeze experienced locally took more the form of a strong north-east monsoon gale accompanied by frequent squalls than that of a cyclonic storm. The sea was very rough throughout."

Weather was less disturbed on the 14th and 15th in this part of the Bay. The Port Blair observations of the next four days, which are the only available information, indicate that the weather was again somewhat disturbed and squally. A broad belt of low pressure continued to occupy the greater part of the south of the Bay, and weather was squally, with variable unsteady winds. During this period Port Blair had strong south-east winds, frequent showers and squally weather. Winds shifted to north-east and decreased rapidly in force on the 20th. Light to moderate north-east winds obtained at that station during the remainder of the month. The final withdrawal of the humid winds of the retreating south-west monsoon from this part of the Bay hence occurred on the 20th of December.

On the 15th pressure differed little from the normal except in the centre and south of the Bay, where it was in moderate defect. Pressure was decreasing over the whole of India, and was in moderate defect on the 16th over nearly the whole of India. The deficiency was greatest on the north-west frontier and off the coast of the Circars in the Bay. The barometric changes of the next 48 hours were small, but on the 18th and 19th pressure increased generally and was in moderate excess over the whole Indian area, the excess being greater in the West Deccan and Bengal than elsewhere. Moderately steep gradients obtained on the 20th in the Peninsula and north of the Bay, and strongish north-east winds were blowing on the Coromandel and Ceylon coasts and were giving light to moderate showers to the south of the Peninsula and East Ceylon.

Pressure increased briskly in Upper India on the 21st and in North-east India on the 23rd. These changes intensified the gradients favouring north-east winds in the Bay. The range of pressure on the morning of the 24th exceeded three tenths of an inch. These changes accompanied the withdrawal of southerly winds from the entrance to the Bay, and on the morning of the 24th northerly winds were blowing at Colombo and Nancowry, and in the extreme south of the Bay. Rain also practically ceased to fall in South Madras on the 27th.

The barometric changes of the next four days were small in amount over the whole of India, except the Punjab, Sind and Beluchistan, where pressure gave way briskly on the 24th and 25th and again increased briskly on the 26th. Strongly marked anticyclonic conditions obtained on the 27th, and pressure was more or less considerably above the normal. The excess ranged from ·01″ on the coast of the Konkan to ·10″ along the foot of the hills in Northern India.

Pressure gave way over the whole Indian region on the 28th, 29th and 30th, the decrease being, as usual in the cold weather, greatest in North-Western and Western India. Pressure on the morning of the 31st was below the normal over the whole of India. The deficiency was large in Northern India, in which it ranged from ·03″ to ·15″. It was greatest in Oudh and Rohilkhand. This general decrease of pressure gave some cloud in different parts of Northern India, but otherwise accompanied no marked change in the weather except in Central Beluchistan, where light showers fell on the 30th and 31st.

Weather continued fine in Southern India and the Bay, cold weather or north-east monsoon winds prevailing over the whole of these areas.

Some light showers of little importance were received in the South Coromandel coast stations, but this period was practically dry and rainless in Southern India. Hence the retreating south-west monsoon rains terminated in South Madras on the 27th December.

No storm reports or reports of snowfall were received during the month.

Temperature of the Air.

The distribution of temperature in India for December, 1891, 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 data by means of which these charts have been prepared are given in Table I. The normal mean maximum and minimum temperatures have been obtained for each station from the observations of the same number of years, *viz.*, 1878 to 1888. 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 amounts which vary from month to month. But the variation of the mean daily temperature from the normal, as determined by the use of this definition, agrees in almost all cases very closely with the variation as determined by the use of true daily means based on readings at 16 hours, in addition to those 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.

The mean maximum temperature was above the normal over the whole of India.

The variations were greater than 2° in four areas, *viz.*, the North Punjab, Rajputana, Bengal and Cachar, and the Peninsula between the 12° and 19° parallels of

latitude. The variations exceeded 3° in the following cases :—

Area.	Station.	Maximum temperature of month.		
		Mean actual.	Mean normal.	Variation.
		°	°	°
Bengal and Cachar	Chittagong	82·1	77·8	+4·3
	Silchar	83·1	79·4	+3·7
	Dinajpur	79·4	76·2	+3·2
	Darbhanga	77·3	73·9	+3·4
Central Peninsula	Masulipatam	86·2	82·3	+3·9
	Gopalpur	81·2	77·2	+4·0
	Karwar	90·5	87·0	+3·5
	Ratnagiri	92·6	89·2	+3·4
	Secunderabad	84·6	81·4	+3·2
Rajputana	Deesa	89·6	84·9	+4·7
	Ajmere	79·6	76·2	+3·4

There was a slight deficiency in Lower and Central Burma.

The most remarkable feature of the day temperature was the great excess in East Bengal and Cachar, and in the Bombay coast districts from Ratnagiri to Karwar, in both of which areas the variations are generally small in amount.

The mean minimum temperature of the month was in excess over the greater part of the country. The excess was small except in two areas, in which it was more than 2°. These areas, were Madras and Central Rajputana. In these two districts the minimum temperature of the month was in excess by amounts ranging from 2° at Ajmere to 2·6° at Bellary. The mean minimum temperature was in defect in Assam, North Behar, Khandeish, Berar, the Central Provinces and some parts of Central India, the North-West Provinces and the Punjab. The negative variations in these areas were small and less than 2° except in the Central Provinces, Central India and Berar. The following gives the largest variations :—

Division.	Station.	Variation.
		°
Central India	Sutna	−2·8
	Indore	−3·4
Central Provinces	Jubbulpore	−2·6
	Khandwa	−2·4
Berar	Akola	−2·7

Hence, over by far the greater part of India, both the night and day temperatures were above the normal, the excess being more marked in the day or maximum than in the night temperature. The same was the case at the hill stations. The following gives data for five hill stations :—

Station.	Variation from normal of month of		
	Mean maximum temperature.	Mean minimum temperature.	Mean daily temperature.
	°	°	°
Quetta	+4·2	+0·9	+2·6
Murree	+3·5	+2·1	+2·8
Darjeeling	+1·8	+0·6	+1·2
Pachmarhi	+1·3	−2·7	−0·7
Mount Abu	+1·4	+1·7	+1·6

The mean temperature of the month was in excess over the whole Indian area, except the Central Provinces, Berar, Khandeish, the eastern districts of Central India and Central Burma. The variations from the normal were less than 2° except in the areas for which data are given below :—

District.	Station.	Variation from normal.
		°
East Bengal and Cachar	Chittagong	+2·7
	Silchar	+2·0
Madras and Deccan	Poona	+2·8
	Vizagapatam	+4·2
	Masulipatam	+3·0
	Bellary	+2·5
	Salem	+2·6
	Secunderabad	+2·5
	Bangalore	+2·7
West Rajputana	Ajmere	+2·7
	Deesa	+3·6

The excess was greater than 2° locally at Peshawar (+2·5°), Mooltan (+2·2°) and Mangalore (+2·3°), and also at the hill stations of Murree (+2·8°) and Quetta (+2·6°).

The chief features of the temperature conditions of the month were :—

1st—Increased temperature over nearly the whole of India. The increased temperature was most marked in the areas which had suffered from very deficient rainfall from the commencement of the previous south-west monsoon, *viz.*, Central and West Rajputana and the greater part of Madras (except the more southern districts). The increased temperature was almost as largely marked in the night as in the day temperature.

2nd—Increased day and night temperature at the hill stations.

3rd—Decreased temperature in the Central Provinces, Berar and Central India. This was due almost solely to unusually low night temperature during the month.

The following gives a brief statement of the more important temperature changes that occurred during the month in India.

Temperature was considerably in excess over the whole of India at the commencement of the month and was in moderate defect in Burma. The following gives variation data of the 1st :—

DISTRICT.	VARIATION FROM NORMAL OF		
	Mean maximum temperature.	Mean minimum temperature.	Mean temperature.
	°	°	°
Burma	−1·4	−2·1	−1·8
Bengal and Assam	+1·9	+1·2	+1·6
North-Western Provinces	+1·4	+5·3	+3·4
Punjab	+2·4	+6·4	+4·4
Rajputana and Sind	+5·3	+4·8	+5·1
Guzerat and Central India	+3·3	+2·0	+2·7
Central Provinces	+2·6	+2·0	+2·3
Bombay	+3·7	+0·7	+2·2
Madras	+4·0	+3·4	+3·7

Conditions remained unchanged until the 7th, when temperature fell steadily and rather rapidly day by day until the 11th or 12th. The fall was immediately preceded by a considerable reduction of temperature in Beluchistan. Thus on the 7th the mean temperature of the day at Quetta was 5·6° below the normal, and on the 8th it was 9·1° below it. The following data gives the average amount of the reduction of temperature (with reference to the normal conditions of the period) during the period from the 7th to the 11th in Northern and Central India :—

DIVISION.	VARIATION FROM NORMAL OF MEAN TEMPERATURE OF		Total reduction of temperature during period.
	7th.	11th.	
	°	°	°
Punjab	+2·3	−1·2	−3·5
North-Western Provinces	+2·5	−2·6	−5·1
Bengal	+2·5	−0·5	−3·0
Sind and Rajputana	+3·3	−3·3	−6·6
Guzerat and Central India	+2·5	−3·2	−5·7
Central Provinces	+2·5	−3·8	−6·3

Temperature was more or less below the average over the whole of Northern and Central India and the North Deccan from the 11th to the 14th, the deficiency being greatest in the Central Provinces and Central India. It then began to rise, and on the 18th was generally above the normal except in Burma, where light to moderate showers were received on the 16th, 17th and 18th, which caused a moderate temporary decrease of temperature.

The following temperature variation data of the 12th and 18th illustrate the character of the change of temperature conditions during the period :—

DIVISION.	VARIATION FROM NORMAL OF THE MEAN TEMPERATURE OF 24 HOURS PRECEDING 8 A.M. OF THE		Change of mean daily temperature between 12th & 18th relatively to the normal.
	12th.	18th.	
	°	°	°
Burma	+2·6	−2·3	−4·9
Bengal and Assam	−0·2	+3·0	+3·2
North-Western Provinces	−2·5	+1·0	+3·5
Punjab	−0·8	+0·9	+1·7
Rajputana and Sind	−1·6	+2·1	+3·7
Guzerat and Central India	−3·4	+0·8	+4·2
Central Provinces	−4·0	+0·8	+4·8
Bombay	−1·3	0	+1·3
Madras	+2·3	+3·0	+0·7

Hence, during this period temperature had increased relatively to the normal conditions by amounts ranging from 0·7° in Madras to 4·8° in the Central Provinces and 4·2° in Central India, whilst it had decreased 4·9° in Burma. This is a second example during the month of the strongly marked tendency in India during the cold weather season for the largest temperature changes (relatively to the normal conditions) to occur in Central India, Berar and the Central Provinces.

Heavy showers fell at the coast stations south of Madras from the 11th to the 15th, but temperature continued more or less largely above the normal in that area.

Temperature increased rather rapidly in Burma from the 18th to the 22nd and was steadily above the normal in India during this period.

No important change occurred during the next three days (from the 18th to the 22nd). Temperature was almost without exception above the normal, the excess being most marked in the Deccan and in North and Central Madras. It was actually greatest on the 21st at Secunderabad (+9·0°) and on the 22nd at Sholapur (+9·1°). On the 22nd, temperature fell below the average at Quetta. During the next five or six days, temperature decreased in Northern and Central India, and was more or less below the normal over the greater part of that area from the 25th to the 29th. The following variation data show from one point of view the nature of the temperature changes during the period :—

DIVISION.	VARIATIONS OF MEAN TEMPERATURE FROM THE NORMAL OF 24 HOURS PRECEDING 8 A.M. OF THE						
	23rd.	24th.	25th.	26th.	27th.	28th.	29th.
	°	°	°	°	°	°	°
Punjab	−1·1	−0·5	−1·6	−1·1	−1·6	+0·5	+1·0
N. W. Provinces	−0·8	−1·7	−2·9	−3·6	−3·0	−1·7	−0·4
Bengal	+1·9	+1·2	−0·5	−0·7	−0·7	−0·4	+1·2
Burma	+1·7	+1·0	+0·2	−0·8	−1·9	−1·9	−0·7
Rajputana and Sind	−0·6	+0·2	−0·2	+1·3	+0·8	+1·4	+0·1
Guzerat and Central India.	+1·1	+1·9	+0·8	+1·0	−2·1	−2·9	−3·2
Central Provinces	+3·0	−1·3	−2·3	−3·2	−3·6	−4·0	−4·3
Bombay	+5·2	+4·3	+2·5	+1·5	+0·9	0	−0·4
Madras	+3·9	+2·8	+2·2	+1·2	+0·7	+0·7	+0·8

These data do not bring out fully the chief features in the character of the change. They show that the cooling was greatest in the North-Western Provinces and the Central Provinces, and that it extended from these areas as centres. The daily charts of the temperature variations of the period indicate that the effect did not pass from west to east across Northern India, in the way temperature changes most frequently occur in Northern India, but that it spread from north to south. One of the most remarkable features was the manner in which what may be described as a wedge of low temperature was thrust southwards from the North-Western Provinces through the Central Provinces, and displaced the area of highest temperature and greatest excess of temperature westwards. The following data give the position and amount of the greatest excess of temperature from the 22nd to 29th, and illustrate the westward shift of the area of most excessive temperature during this period—

Date.	Station where greatest mean variation of temperature was recorded.	Amount of excess.
		°
22nd	Sholapur	+ 9·1
23rd	Sholapur	+ 9·2
24th	Surat	+ 10·0
25th	Rajkot	+ 7·9
26th	Rajkot	+ 6·0
27th	Hyderabad	+ 5·1
	Quetta	+ 5·0
28th	Kurrachee	+ 3·6
	Quetta	+ 11·8
29th	Quetta	+ 12·3

The southward march of the area of greatest deficiency of temperature or of cold during this period is illustrated by the following data:—

Date.	Stations where mean temperature of date was most largely in defect.	Amount of deficiency or of negative variation.
		°
23rd	Lahore	—2·6
24th	Meerut	—4·1
	Nowgong	—4·2
	Seoni	—4·7
25th	Agra	—5·8
	Nowgong	—5·8
26th	Nowgong	—6·7
	Jubbulpore	—5·8
27th	Nowgong	—6·5
	Hoshangabad	—5·8
28th	Indore	—6·6
	Khandwa	—6·8
29th	Indore	—6·7
	Khandwa	—6·6

The character of the temperature variations at this period in these two areas is more fully shown by the following data for seven typical cases:—

	Station.	Date.	Variation from Normal of	
			Mean Maximum temperature.	Mean Minimum temperature.
			°	°
Cool area	Agra	25th	—3·2	— 7·5
	Nowgong	26th	—3·7	— 9·7
	Khandwa	28th	—4·4	— 9·2
Warm area	Sholapur	22nd	+ 7·4	+ 10·8
	Surat	24th	+ 7·2	+ 12·8
	Rajkot	26th	+ 5·1	+ 6·8
	Quetta	29th	+ 8·5	+ 16·0

These figures show clearly:—

1st.—In the cool area both day and night temperatures were below the normal, but the deficiency was from two to three times as large in the minimum or night temperature as in the day temperature.

2nd.—In the warm area both the day and night temperatures were largely above the normal, but the increased temperature was more strongly exhibited in the night than in the day temperature.

The chief causes of these remarkable temperature variations can only be conjectured in the absence of complete snowfall information of the Himalayas, more especially of the Central Himalayas.

A very slight disturbance appeared in Beluchistan on the 29th and gave light showers on that day and the 30th. This caused a large reduction on the north-west frontier. The mean temperature at Quetta on the 31st was 6·4° below the normal. The following gives temperature variation data of the last day of the month:—

District.	Variation of		Mean from normal of day.
	Mean maximum from normal of day.	Mean minimum from normal of day.	
	°	°	°
Burma	—1·2	—3·1	—2·2
Bengal and Assam	+ 1·1	—2·4	—0·7
North-Western Provinces	+ 1·2	+ 1·7	+ 1·5
Punjab	+ 2·7	+ 2·8	+ 2·8
Sind and Rajputana	+ 1·6	+ 2·5	+ 2·1
Guzerat and Central India	+ 1·3	—3·3	—1·0
Central Provinces	—0·9	—5·0	—3·0
Bombay	+ 1·5	—1·6	—0·1
Madras	+ 0·9	—0·2	+ 0·4

The preceding data show that temperature at the end of the month was in moderate excess in Northern India, South Madras and Mysore, and was considerably in de-

fect in Central India, the Central Provinces and Lower Burma.

In the absence of mean data for the Upper Burma stations, it is not possible to trace the progress of the cool area in Burma in the last week of the month, but it appears to have advanced as a cool wave from the north and to have produced a larger effect in Lower than in Upper Burma. It would thus appear that this cool wave in Burma resembled in its more important features the cool waves that advanced from the North-Western Provinces into the Central Provinces.

The following table gives the variation of the mean temperature from the normal week by week during the month and for the whole month for the larger Provinces of India. It shows the larger changes of temperature which occurred during the month:—

Province.	Variation of mean temperature from Normal for week ending December				Variation of monthly mean temperature from normal.
	5th.	12th.	19th.	26th.	
Burma	−1°8	+0°7	−0°3	+0°9	−0°3
Bengal and Assam	+2·0	+1·2	+1·4	+1·2	+1·2
North-Western Provinces and Oudh	+3·0	+0·2	−0·2	−0·6	+0·3
Punjab	+3·9	+0·4	+0·5	−0·4	+0·8
Bombay	+1·5	+0·1	+0·7	+3·4	+1·2
Central Provinces and Berar	+2·2	−0·7	−0·4	+0·9	−0·3
Central India and Guzerat	+2·6	−0·1	−0·4	+1·4	+0·3
Sind and Rajputana	+4·3	+0·4	+1·1	+0·6	+1·4
Madras	+2·7	+1·5	+2·3	+3·4	+2·2

Winds.

The mean wind directions at 8 A.M. during the month are shown in Plate I by arrows flying with the wind. They are obtained by the use of Lambert's formula, in which equal value is given to every wind. The data are given in Table I. The mean wind directions derived from the wind observations at 10 A.M. and 4 P.M. are given in the small chart, No. 4 of Plate III, by means of arrows flying with the wind. The data for these will be found in Table II, together with the normal directions as obtained from the observations of the past 10 to 20 years.

The normal air-motion of the month of December in India is very similar to that of the preceding month, but is generally stronger and steadier.

In Northern India the mean wind direction is north-west in the East Punjab and North-Western Provinces, west in Bihar, north-west to north in Bengal, and east in Assam. Northerly winds obtain in the Indus Valley, north-easterly winds in the South-West Punjab and Central India, and easterly winds in the Central Provinces, Berar and the Deccan. In the Madras coast districts and Deccan, winds range between north-east and east, east-north-east being the predominant direction. Northerly winds prevail in the Irrawaddy Valley in Burma and north-east winds in Tennasserim and at Port Blair. It will thus be seen that over the whole of Northern India and Burma the mean direction of the air-motion appears to a large extent to be determined by the direction of the great river valleys or plains.

The most important feature of the air-motion of the month is the final withdrawal of the humid winds of the retreating south-west monsoon from the south of the Bay. This usually occurs in the third or fourth week of the month. The mean wind direction of the month at Port Blair is north-east and at Nancowry is east-south-east. Hence the north-east winds of the Bay are modified in character to some extent during the month. They become north-east trade winds, similar in character to those which usually prevail during the whole month in the Arabian Sea, and hence are after the third or fourth week of the month comparatively dry winds which give little or no rain to Madras.

Winds are throughout the month local in character at the Bombay coast stations. These stations are shielded by the West Ghâts from the easterly winds of the Deccan, and hence the winds at these stations are almost solely land and sea breezes. The mean wind directions of the month are north at Bombay, Ratnagiri and Karwar, east at Goa and south-west at Cochin and at Calicut.

The following gives a statement of the mean air movement in different parts of India, during the month of December 1891:—

Meteorological Province.	Mean air movement per hour in miles.	Meteorological Province.	Mean air movement per hour in miles.
Burma Coast	4	Indus Valley and North-West Rajputana	3
Burma Inland	5	Rajputana, Central India and Guzerat	3
Assam	3	Deccan	4
Bengal and Orissa	3	West Coast	6
Gangetic Plain and Chota Nagpur	2	South India	7
Upper Sub-Himalayas	1		

It was stated in the October Review that the belt of low pressure was transferred unusually early in that month to the south of the Bay. Steeper gradients than usual hence obtained in the north and centre of the Bay during the months of November and December. The air movement in the Gangetic plains and Bengal and the north of the Bay of Bengal was hence unusually steady, and also on the whole slightly stronger than the normal. The abnormal steadiness of the winds in the North-Western Provinces and the adjacent districts of Central India and Bihar in

The preceding statement shows that over the whole of India, the cloud amount was much smaller than usual. Over an area including Berar, Central India and the northern districts of the Central Provinces, the cloud amount was less than 1, the normal amount being nearly 2.

The abnormal conditions in the south-east of the Bay of Bengal and Andaman Sea gave, as might be expected, increased cloud to that area. The excess was very marked at Port Blair, Diamond Island and Mergui, for which data are given below:—

Station.	Cloud.		
	Actual.	Normal.	Variation.
Port Blair	6·7	4·5	+2·2
Diamond Island	4·9	3·3	+1·6
Mergui	4·4	3·2	+1·2

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 officer in the province, and published in the *Provincial Gazette*. 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 December 1891, 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.

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 160 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 indicating the rainfall. The line of no rainfall is indicated by two parallel lines separated by a short distance, one continuous and the other dotted, the latter facing the districts of no rainfall.

The second chart illustrating the distribution of the rainfall of the month is given in Plate V, and shows by figures the variation of the mean actual rainfall of the month from the normal rainfall in each of the 52 meteorological districts into which India and Burma have been divided for purposes of comparing crops and rainfall. The data of this chart are deduced from the rainfall information telegraphed by district officers, of which a summary is given in the following table, and the actual figures utilized are those given in the last column. The numbers given in the centre of each district are the variations of the actual mean rainfall of the district from the normal mean rainfall. A number given in a corner of each district in small slanting figures serves as an index by means of which, on referring to the list of districts at the foot of the chart, the name of the district can be at once ascertained.

December is usually the month of least rainfall in India. The average rainfall is less than an inch in amount over the whole of India with the exception of the greater part of South Madras. Over by far the greater part of Northern and Central India the average rainfall is less than three or four tenths. The average rainfall slightly exceeds ten inches at the South Coromandel coast stations, but diminishes rapidly inland and northwards, and is less than one inch in amount to the west of a line joining Madura, Trichinopoly, Salem, Cuddapah and Ongole.

The following table gives mean actual and variation rainfall data for the 52 meteorological divisions or districts into which India is divided, in the same form as in previous months, and has been prepared in exactly the same manner as hitherto.

Province.	Division.	Average actual rainfall of period.					Average total rainfall, December 1891.	Normal average rainfall, December.	Variation from normal.
		1st to 5th December.	6th to 12th.	13th to 19th.	20th to 26th.	27th to 31st.			
		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Burma	Tenasserim	0	0	0	0	0	0	0	0
	Lower Burma	0	0	0·08	0	0	0·08	0·16	−0·08
	Central do.	0·40	0	0·11	0·01	0·21	0·73	0·09	+0·64
	Upper do.	0	0	0·11	0	0	0·11	?	?
	Arakan	0	0	0·10	0·21	0	0·31	0·37	−0·06
Bengal and Assam	Eastern Bengal	0	0	0·01	0	0	0·01	0·44	−0·43
	Assam (Surma)	0·04	0	0	0	0	0·04	0·58	−0·54
	Do. (Brahmaputra)	0	0	0	0	0	0	0·44	−0·44
	Deltaic Bengal	0	0	0	0	0	0	0·33	−0·33
	Central do.	0	0	0	0	0	0	0·22	−0·22
	North do.	0	0	0	0	0	0	0·24	−0·24
	Orissa	0	0	0	0	0	0	0·62	−0·62
	Chota Nagpur	0	0	0	0	0	0	0·36	−0·36
	Bihar (South)	0	0	0	0	0	0	0·23	−0·23
	Do. (North)	0	0	0	0	0	0	0·19	−0·19

Province.	Division.	Average actual rainfall of period. 1st to 5th December.	6th to 12th.	13th to 19th.	20th to 26th.	27th to 31st.	Average total rainfall, December 1891.	Normal average rainfall, December.	Variation from normal.
		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches	Inches.
North-Western Provinces and Oudh.	North-Western Provinces (East)	0	0	0	0	0	0	0·26	−0·26
	Oudh (South)	0	0	0	0	0	0	0·46	−0·46
	Do. (North)	0	0	0	0	0	0	0·41	−0·41
	North-Western Provinces (Central)	0	0	0	0	0	0	0·45	−0·45
	Do. do. (West)	0	0	0	0	0	0	0·48	−0·48
	Do. do. (Submontane)	0	0	0	0	0	0	0·58	−0·58
Punjab	Punjab (South)	0	0	0	0	0	0	0·30	−0·30
	Do. (Central)	0	0	0	0	0	0	0·35	−0·35
	Do. (Submontane)	0	0	0	0	0	0	0·62	−0·62
	Do. (Hill Districts)	0	0	0	0	0	0	1·17	−1·17
	Do. (North-West)	0	0	0	0	0	0	0·69	−0·69
	Do. (West)	0	0	0	0	0	0	0·16	−0·16
Bombay and Malabar Coast Districts (Madras).	Malabar	0·28	0·65	1·04	0·20	0	2·17	1·18	+0·99
	Madras (South Central)	0·06	0·14	0·32	1·15	0	1·67	1·69	−0·02
	Coorg	0	0	0	0	0	0	0·77	−0·77
	Mysore	0·01	0	0·01	0·03	0	0·05	0·60	−0·55
	Konkan	0	0·03	0	0	0	0·03	0·17	−0·14
	Bombay Deccan	0	0	0	0·01	0	0·01	0·45	−0·44
	Hyderabad (North)	0	0	0	0	0	0	?	?
Central Provinces and Berar.	Khandeish	0	0	0	0·01	0	0·01	0·62	−0·61
	Berar	0	0	0	0	0	0	0·76	−0·76
	Central Provinces (West)	0	0	0	0	0	0	0·52	−0·52
	Do. (Central)	0	0	0	0	0	0	0·36	−0·36
	Do. (East)	0	0	0	0	0	0	0·38	−0·38
Bombay (North)	Guzerat	0	0	0	0	0	0	0·03	−0·03
	Kattiawar	0	0	0	0	0	0	0·02	−0·02
	Sind	0	0	0	0	0	0	0·10	−0·10
Rajputana and Central India.	Central India (East)	0	0	0	0	0	0	0·37	−0·37
	Rajputana (East), Central India (West)	0	0	0	0	0	0	0·29	−0·29
	Rajputana (West)	0	0	0	0	0	0	0·08	−0·08
Madras	East Coast (North)	0·02	0	0	0	0	0·02	1·20	−1·18
	Do. do. (a)	0	0	0	0	0	0	?	?
	Hyderabad (South)	0	0	0	0	0	0	0·23	−0·23
	Madras (Central)	0·01	0	0·02	0·09	0	0·12	0·34	−0·22
	East Coast (Central)	0·09	0·09	0·50	0·17	0	0·85	1·98	−1·13
	East Coast (South)	0·80	3·23	3·14	1·70	0·18	9·05	3·78	+5·27
	Madras (South)	0·30	0·09	0·52	1·60	0·09	2·60	2·58	+0·02

No rain fell over by far the greater part of the country. The following provinces were absolutely or practically rainless during the month:—The Punjab, Rajputana, Sind, Central India, the North-Western Provinces, the Central Provinces, Berar, Hyderabad (Deccan), Bombay, Assam and Bengal.

Burma obtained very light showers, chiefly between the 16th and 18th, but the mean actual rainfall of the whole province for the month was less than three-tenths of an inch.

North Beluchistan received moderate rain on the 29th and 30th. This rain was quite local and did not extend eastwards into the Punjab. Khanai obtained 2·45 inches during this period, Bostan 1·5 inches, Peshin 0·35 inch and Quetta 0·17 inch.

In Travancore, showers fell almost daily until the 20th, when dry weather set in. The periods of most general rain were the 1st and 2nd and from the 11th to the 16th.

No rain (*i. e.*, less than an average of a tenth of an inch) fell in the north coast districts of Madras (*viz.*:—Ganjam, Vizagapatam, Godavari and Kistna), and in the Madras Deccan districts of Bellary, Kurnool and Anantapur.

Over the remainder of the Madras Presidency there were three periods of rainfall:—on the 1st and 2nd, from the 9th to the 15th, and from the 20th to the 23rd. South Arcot, Tanjore and Trichinopoly received moderate rain during the first period, and the remaining districts light showers.

The second period of rainfall gave a heavy burst of rain to the Chingleput, North Arcot, South Arcot, Tanjore and Trichinopoly districts, and light to moderate showers in Salem, Coimbatore, Tinnevelly, Madura, Cuddapah and Nellore. The rainfall during this period was very heavy in the Tanjore and South Arcot districts. The following gives the more remarkable rainfalls during the period:—

District.	Station.	Rainfall.	Date.
		Inches.	
Tanjore	Mayavaram	5·30	10th.
	Negapatam	7·50	"
	Tiruvalur	5·20	"
	Shiyali	5·75	"
	Tranquebar	12·50	"
Tanjore	Mayavaram	5·35	13th.
	Shiyali	5·15	"
	Tiruvalur	6·50	"
	Tranquebar	10·40	"

Light to moderate showers fell in Nellore, Chingleput, North Arcot and Cuddapah, on the 20th and 21st during the third period. South Arcot, Tanjore, Trichinopoly, Madura, Tinnevelly and the Nilgiris received moderately heavy rain from the 20th to the 23rd, and Coimbatore

light showers during the same period. The southern districts of Tanjore, Madura and Tinnevelly again obtained general rain on the 26th and 27th. This was a heavier burst than the preceding one in these districts, and rainfalls exceeding three inches in 24 hours were recorded at several stations The largest fall during this period was 6·25 inches at Pamben on the 26th.

The following gives a summary of the complete rainfall data of the month published in the Madras Government Gazette :—

Meteorological division.	District.	Rainfall.			Number of rainy days.		
		Average actual.	Average normal.	Variation.	Average actual.	Average normal.	Variation.
		Inches.	Inches.	Inches.			
Madras East Coast, North	Ganjam	0·02	1·39	−1·37	0·1	1·1	−1·0
	Vizagapatam	0·04	1·06	−1·02	0·1	0·8	−0·7
	Godavari	0·02	0·67	−0·65	0	0·6	−0·6
East Coast, Central.	Kistna	0	0·52	−0·52	0	0·7	−0·7
	Nellore	2·49	2·72	−0·23	3·5	2·9	+0·6
East Coast South.	Chingleput	7·94	5·03	+2·91	9·8	4·7	+5·1
	North Arcot	4·37	2·97	+1·40	6·3	3·4	+2·9
	South Arcot	10·37	5·64	+4·73	10·4	5·4	+5·0
	Tanjore	16·83	8·02	+8·81	15·4	7·3	+8·1
	Trichinopoly	3·86	3·69	+0·17	8·5	5·2	+3·3
Madras, South	Madura	3·13	4·02	−0·89	5·9	4·9	+1·0
	Tinnevelly	3·65	3·95	−0·30	6·6	5·0	+1·6
Malabar Coast	Malabar	0·75	0·99	−0·24	1·1	1·7	−0·6
	South Canara	0	0·48	−0·48	0	0·9	−0·9
Madras South Central.	Salem	0·87	1·45	−0·58	3·3	2·7	+0·6
	Coimbatore	1·30	1·31	−0·01	2·9	2·5	+0·4
Madras Hills	Nilgiris	2·46	2·95	−0·49	5·1	4·5	+0·6
Madras Central.	Cuddapah	0·56	0·98	−0·42	2·0	1·6	+0·4
	Anantapur	0·03	0·23	−0·20	0·1	0·7	−0·6
	Bellary	0	0·16	−0·16	0	0·4	−0·4
	Kurnool	0	0·31	−0·31	0	0·6	−0·6

The preceding statement shows very clearly the distribution of the rainfall of the month in the Madras Presidency. The average rainfall of the whole presidency was slightly in excess, but this was largely due to very heavy rainfall in the South Coromandel coast districts. Over the greater part of the Presidency rain was more or less largely in defect. The rainfall of the month was hence very unequally and irregularly distributed. No rain fell in the Kistna, Bellary, Kurnool and South Canara districts, and less than an average of a tenth of an inch in the Ganjam, Anantapur, Godavari, and Vizagapatam districts. The drought which set in over these districts in October was hence continued until the end of the retreating south-west monsoon period.

Rainfall was, on the other hand, more or less considerably in excess in the southern districts of Chingleput, North and South Arcot, Tanjore, and Trichinopoly. It was excessive in Tanjore and South Arcot; Tanjore received an average of 16·83 inches or more than double its normal rainfall (8·02 inches), and South Arcot an average of 10·37 inches, or nearly double its normal average (5·64 inches). A reference to the average actual and normal number of rainy days shows that the excess was as strongly marked in that feature of the rainfall. The increased rain in that area was hence due to more frequent and persistent rain than usual, and not to one or two heavy cyclonic downpours. Over the remainder of the Madras Presidency the rainfall of the month was in defect. The deficiency relatively to the normal was generally small in amount, but was largest in the interior districts of Cuddapah and Salem.

Mysore received practically no rain during the month and the drought in that area was hence as marked as in the Southern Deccan districts.

Explanation of Tables.

Table I gives an abstract of the meteorological observations at 8 A.M. daily, taken at 168 stations in India during the month of December 1891.

In this table the observing stations are grouped under two sets of divisions. According to the first arrangement India and Burma are divided into eleven large meteorological areas or provinces. These divisions have been selected in consultation with the Medical Department. The climatic conditions of each area are fairly uniform, and they hence are presumed to form suitable areas for the discussion of the relations between disease and meteorology. The names of these divisions are printed in bold type, and the mean variations of the more important meteorological data, more especially temperature, are given opposite to each in prominent figures.

Each of these larger divisions is sub-divided into smaller meteorological areas or districts, of which there are 51 in all. This sub-division was made in consultation with the Revenue and Financial Departments. In each of these smaller areas the distribution and character of the rainfall are fairly uniform, and the staple crops in each are hence the same. This sub-division will, it is hoped, enable a more exact comparison to be made between crops and rainfall than has been hitherto possible.

The headings of the columns in the great majority of cases explain themselves. The figures in the third column "variation from normal" are obtained by taking in each case the difference between the mean actual barometer (reduced for temperature, but not to sea-level or constant gravity) and the normal means obtained from the observations of the eleven years' period, 1878-88.

The "mean daily temperature" is assumed in Table I to be the mean of the maximum and minimum. It is chiefly utilized in order to obtain the mean variation of the temperature of the month from the normal.

In obtaining the figures for the column headed "Number

of rainy days," a rainy day is assumed to be one on which a fall of a tenth of an inch or upwards has been recorded. A fall of less than a tenth of an inch is practically of no value for agricultural purposes in India, and it has not been found possible to secure the accurate record of rainfalls of less than a tenth of an inch at a great majority of the rainfall-recording stations.

Table II gives an abstract of the observations recorded at 10 A.M. and 4 P.M. at 91 second-class observatories throughout India, Burma and the adjacent regions. This table is intended in part to supplement Table I, and hence information given in full in the latter table as, for example, rainfall, is not included in Table II. This table is intended to give for the month, so far as is possible, all the information furnished hitherto in the Appendix A of the Annual Report on the Meteorology of India. The methods of calculating the means have been very fully explained in the Annual Reports, to which the reader is referred for complete information. The data of the mean daily pressure, the figures of which are given in the sixth column, are the means of the 10 and 16 hours' observations, with corrections obtained from a comparison of the 10 and 16 hours' observation of the same or a neighbouring observatory, with a series of hourly observations at the same observatory.

The mean temperature is calculated by the formula $\text{mean} = \frac{\textit{maximum} + \textit{16 hours} + \textit{2 minimum}}{4}$ by applying a constant correction for each month, derived from the hourly observations of the same or of a neighbouring station.

The mean daily vapour tension and humidity are the averages of the values for 10 A.M., 4 P.M. and the minimum readings, and the mean daily cloud is the average of the mean amounts for 10 and 16 hours.

The mean wind direction for each month is the trigonometrical resultant of the winds given under each of the eight cardinal points, and is calculated by means of Lambert's formula, in which an equal weight or value is given to every wind.

It should be noted that in the preceding discussion, in speaking of the maximum, minimum, or mean temperature, the total amount of wind or the rainfall of a given day, as, for example, the 5th, the maximum, etc., of the 24 hours preceding 8 A.M. of the 5th is meant. This definition has been adopted to avoid confusion. As the observations are taken at 8 A.M., a part of them refer to 8 A.M. of that day and a part to the previous twenty-four hours, and therefore, including a portion of the previous civil day. It is found most convenient to use the same date to designate and define both classes of observations.

Table

Abstract of Observations taken at 8 A.M. at 168

Meteorological Province or District.	Station.	Height of Station in feet.	Pressure 8 A.M. in inches. 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.	Temperature of Air. 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.		...	...	+ ·036	...	...	...	...	...	...	...	85·0	−0·7	67·9	+0·6	76·3	−0·1	17·2	...	...	...	...	27·7
Bay Islands	Port Blair	61·16	29·927	?	29·919	30·012	25th	29·856	10th	·156	80·0	84·3	?	77·2	?	80·7	?	7·1	89·0	3rd	74·0	5th	15·0
	Camorta	?	29·959	?	?	30·031	25th	29·854	9th	·177	79·8	83·7	?	76·2	?	80·0	?	7·5	86·6	18th	74·1	9th	12·5
Tenasserim	Mergui	96·27	29·923	?	29·950	30·041	25th	29·858	9th	·183	76·7	87·5	?	63·1	?	75·3	?	24·4	91·1	10th	54·9	26th	36·2
	Tavoy	26·26	30·010	?	29·967	30·099	25th & 26th.	29·952	4th	·147	75·4	88·6	?	67·4	?	78·0	?	21·2	92·7	17th	59·7	26th	33·0
	Moulmein	93·79	29·965	+·035	29·999	30·097	25th	29·892	9th	·205	74·5	87·4	+0·1	70·5	+4·2	78·7	+2·2	16·9	92·5	10th	65·4	31st	27·1
	Toungoo	181·1	29·885	+·040	30·014	29·993	25th	29·815	31st	·178	67·2	82·3	−2·0	64·0	+0·9	73·2	−0·6	18·3	86·8	3 days	53·1	31st	33·7
Lower Burma	Rangoon	40·69	30·020	+·033	29·995	30·143	25th	29·952	10th	·191	72·0	?	?	69·1	+1·2	?	?	?	?	?	62·8	26th	?
	Bassein	21	30·040	+·039	29·998	30·147	25th	29·974	9th	·173	70·5	83·7	−0·8	66·9	+1·4	75·3	+0·3	16·8	87·2	3 days	61·0	31st	26·2
	Diamond Island.	41	30·010	+·034	29·986	30·104	25th	29·942	16th	·162	75·5	83·2	−1·4	68·3	−4·1	75·8	−2·8	14·9	86·4	3 days	65·1	5 days	21·3
Arakan	Akyab	20·44	30·059	+·034	30·022	30·162	25th	29·984	31st	·178	68·9	82·6	+0·5	64·6	+0·1	73·6	+0·3	18·0	86·2	12th	57·2	31st	29·0
II.—Burma, Inland		...	...	+ ·059	...	...	...	...	...	...	...	81·4	−1·3	57·0	−2·1	69·2	−1·7	24·4	...	...	...	...	37·5
Central Burma	Thayetmyo	134	29·962	+·059	30·044	30·048	24th & 25th.	29·876	31st	·172	68·0	83·2	−1·3	57·4	−2·1	70·3	−1·7	25·8	87·3	8th	42·9	31st	44·4
Upper Burma	Mandalay	?	29·858	?	29·801	29·970	13th	29·744	31st	·226	65·7	85·4	?	62·5	?	74·0	?	22·9	89·0	7th & 8th	54·0	31st	35·0
	Kindat	?	29·731	?	29·679	29·808	26th & 27th.	29·690	31st	·118	61·6	79·5	?	57·0	?	68·2	?	22·5	83·8	8th	52·0	30th & 31st.	31·8
	Bhamo	?	29·715	?	29·665	29·787	27th	29·573	31st	·214	55·5	77·4	?	51·0	?	64·2	?	26·4	82·0	8th	43·3	31st	38·7
III.—Assam		...	...	+ ·036	...	...	...	...	...	...	...	77·5	+2·2	53·2	−0·7	65·4	+0·7	24·3	...	...	...	...	32·4
Assam (Surma)	Silchar	104·3	30·004	+·042	30·065	30·096	27th	29·919	31st	·177	61·5	83·1	+3·7	55·5	+0·3	69·3	+2·0	27·6	86·5	18th	47·5	30th	39·0
Brahmaputra	Sibsagar	333	29·818	+·042	30·131	29·896	25th	29·742	5th	·154	53·1	73·6	+1·8	48·7	−1·9	61·2	−0·1	24·9	76·3	7th	44·1	28th	32·2
	Dhubri	115·34	30·007	+·024	30·083	30·088	24th & 25th.	29·886	31st	·202	58·6	75·9	+1·2	55·4	−0·6	65·7	+0·3	20·5	78·5	6th	52·4	29th	26·1
IV.—Bengal and Orissa		...	...	+ ·042	...	...	...	...	...	...	...	78·5	+2·1	56·2	+1·0	67·4	+1·5	22·3	...	...	...	...	31·7
East Bengal	Chittagong	86·7	30·009	+·040	30·047	30·094	25th	29·930	31st	·164	65·8	82·1	+4·3	59·2	+1·0	70·7	+2·7	22·9	85·7	3 days	53·6	29th & 31st.	32·1
	Lungleh	?	?	?	?	?	?	?	?	?	57·5	62·0	?	55·1	?	58·6	?	6·9	70·9	11th	48·9	31st	22·0
	Noakhali	42·73	30·057	?	30·049	30·162	24th	29·955	31st	·207	64·5	80·4	?	55·6	?	68·0	?	24·8	84·5	18th	48·0	28th	36·5
	Comilla	34·74	30·074	?	30·058	30·159	24th & 25th.	29·986	31st	·173	62·8	80·0	?	55·8	?	67·9	?	24·2	83·9	18th	50·1	29th	33·8
	Sirajganj	46·37	30·060	?	30·058	30·149	25th	29·959	31st	·190	60·6	78·6	?	54·1	?	66·4	?	24·5	81·2	2nd	47·7	31st	33·5
	Dacca	21·7	30·080	+·039	30·051	30·168	25th	29·987	31st	·181	62·2	80·4	+2·1	57·3	0	68·8	+1·1	23·1	83·1	3 days	52·3	28th & 30th.	30·8
	Barrisal	12	30·089	+·051	30·047	30·181	24ht	30·003	31st	·178	64·6	78·4	+2·6	56·6	+0·4	67·5	+1·5	21·8	81·9	7th	50·1	29th	31·8
	Mymensingh	55·18	30·051	+·048	30·062	30·130	25th	29·958	31st	·172	60·7	78·1	* 2·1	55·2	+1·7	66·7	* 1·9	22·9	80·6	1st & 6th	49·8	30th	30·8
Deltaic Bengal	Faridpur	39	30·077	?	30·066	30·161	25th	29·989	31st	·172	62·0	75·2	?	55·9	?	65·6		19·3	80·0	1st, 6th & 7th.	49·5	28th	30·5
	Jessore	33·29	30·079	+·038	30·060	30·181	25th	29·987	31st	·194	61·6	79·0	+1·1	56·1	+1·0	67·6	+1·1	22·9	82·2	7th & 10th.	50·5	29th & 31st.	31·7
	Calcutta	21·38	30·105	+·041	30·073	30·211	24th	30·003	31st	·208	62·1	78·2	+2·2	56·6	+0·4	67·5	+1·3	21·6	81·2	1st	50·7	3 days	20·5
	Saugor Island	25·3	30·093	+·038	30·063	30·201	24th	30·007	31st	·194	64·0	77·7	+2·0	59·0	+0·1	68·4	+1·1	18·7	81·7	1st	52·8	27th	28·9
	Krishnagar	46·64	30·074	?	30·073	30·177	24th	29·976	31st	·201	61·2	79·4	?	54·0	?	66·7	?	25·4	82·3	6th	48·3	25th	34·0
	Midnapore	148·88	29·975	?	30·079	30·075	24th	29·885	31st	·190	62·1	80·7	?	55·7	?	68·3	?	25·0	84·3	3rd & 4th	47·1	27th	37·2
Central Bengal	Bankura*	298	29·800	?	30·068	29·900	24th	29·703	31st	·197	59·6	79·0	?	54·7	?	66·9	?	24·3	82·6	1st & 3rd	47·8	26th	34·8
	Raniganj*	345·15	29·792	?	30·110	29·904	24th	29·679	31st	·225	57·5	†79·8	?	†54·4	?	†67·1	?	25·4	83·1	1st	48·2	25th	34·9
	Burdwan	99·09	30·041	+·049	30·093	30·146	24th	29·939	31st	·207	61·8	79·9	+2·3	56·1	+0·5	68·3	+1·4	23·8	83·1	1st	49·5	26th	33·6

* Observations of 30 days.
† Mean of 29 days.

I.

stations in India, Burma, etc., in December 1891.

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 October to 31st December 1891.	Normal rainfall for period 1st October to 31st December.	Variation from normal of period.	Station.	Meteorological Province or District.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2·09	1·06	+1·03	...	...	...	**I.—Burma Coast and Bay Islands.**	
1	4	11	3	8	4	...	..	...	11	7	+ 57	84	·864	6·6	18	...	...	17·57	5·94	+11·63	36·11	27·08	+9·03	Port Blair .	Bay Islands.
...	...	...	...	...	...	...	...	...	4	...	...	84	·851	7·8	15	...	...	9·58	...	...	...	...	...	Camorta.	
...	9	10	6	3	...	...	...	3	2	2	0	74	·687	4·3	0	...	...	0·05	0·57	−0·52	21·05	17·74	+3·31	Mergui .	Tenasserim.
26	1	3	1	...	...	...	...	...	1	?	?	77	·687	0·5	0	...	...	0	0·14	−0·14	7·34	12·98	−5·64	Tavoy.	
...	10	10	6	3	...	...	...	2	3	3	0	83	·719	1·4	0	...	...	0	0·02	−0·02	8·81	10·86	−2·05	Moulmein.	
3	19	2	...	...	...	...	...	7	2	2	0	92	·619	4·2	1	...	...	0·23	0·25	−0·02	7·08	8·51	−1·43	Toungoo.	
...	9	17	5	...	...	...	...	...	5	5	0	84	·666	4·5	0	...	...	0	0·08	−0·08	6·04	10·26	−4·22	Rangoon .	Lower Burma.
9	2	16	4	...	...	...	...	...	4	3	+33	85	·633	5·1	1	...	...	0·26	0·18	+0·08	13·95	13·27	+0·68	Bassein.	
...	11	16	4	...	...	...	...	...	12	7	+71	75	·664	4·9	2	...	...	0·67	1·17	−0·50	19·45	23·87	−4·42	Diamond Island.	
...	20	11	...	...	...	...	...	...	2	2	0	88	·626	2·5	0	...	...	0	1·20	−1·20	13·39	14·16	−0·77	Akyab .	Arakan.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·11	0·22	−0·11	...	...	...	**II.—Burma, Inland.**	
1	19	5	2	...	...	...	...	4	5	3	+66	83	·572	3·1	0	...	...	0·08	0·11	−0·03	4·72	6·98	−2·26	Thayetmyo .	Central Burma.
2	7	3	1	...	1	...	...	17	?	?	?	81	·516	2·8	0	...	...	0	0·29	−0·29	4·89	4·30	+0·59	Mandalay .	Upper Burma.
27	1	1	...	...	...	...	...	...	2	?	?	95	·522	0	0	...	...	0	0·15	−0·15	6·07	9·05	−2·98	Kendat.	
...	...	9	3	1	...	2	3	13	?	?	?	93	·415	5·2	1	...	...	0·36	0·33	+0·03	3·57	5·52	−1·95	Bhamo.	
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0	0·55	−0·55	...	...	...	**III.—Assam.**	
29	...	...	2	...	...	...	...	...	3	2	+50	87	·477	5·3	0	...	...	0	1·01	−1·01	6·29	7·13	−0·84	Silchar .	Assam (Surma).
5	1	14	6	3	...	2	...	...	1	2	−50	100	·405	3·2	0	...	...	0	0·56	−0·56	5·58	6·39	−0·81	Sibsagar .	Brahmaputra.
1	1	20	9	...	...	...	...	...	6	5	+20	89	·438	0·8	0	...	...	0	0·07	−0·07	1·27	3·77	−2·50	Dhubri.	
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·01	0·33	−0·31	..	...	...	**IV.—Bengal and Orissa.**	
23	3	4	...	...	...	...	...	1	1	3	−66	87	·557	3·8	2	...	...	0·34	0·88	−0·54	3·18	7·61	−4·43	Chittagong .	East Bengal.
...	...	...	...	...	...	...	...	...	...	...	...	89	·428	?	0	...	...	0	?	?	11·40	?	?	Lungleh.	
7	14	7	3	...	...	...	...	...	2	?	?	85	?	0	0	...	...	0·06	0·36	−0·30	3·88	9·83	−5·95	Noakhali.	
11	18	2	...	...	...	...	...	...	1	?	?	88	?	1·6	0	...	...	0	0·25	−0·25	7·01	6·85	+0·16	Comilla.	
...	10	10	4	...	1	...	3	3	0	?	?	89	?	1·3	0	...	...	0	?	?	4·58	?	?	Sirajganj.	
7	11	1	1	...	...	1	2	8	3	2	+50	85	·478	2·5	0	...	...	0	0·24	−0·24	1·87	5·27	−3·40	Dacca.	
24	4	2	...	...	...	...	...	1	2	?	?	87	·518	1·1	0	...	...	0	0·36	−0·36	2·57	6·75	−4·18	Barrisal.	
16	3	4	5	1	...	...	...	2	1	?	?	90	·482	1·9	0	...	...	0	0·20	−0·20	5·87	6·38	−0·51	Mymensingh.	
17	12	...	...	...	...	...	...	2	2	?	?	89	?	1·3	0	...	...	0	0·12	−0·12	2·63	5·21	−2·58	Faridpur .	Deltaic Bengal.
12	9	1	1	...	...	...	1	7	2	2	0	84	·436	2·2	0	...	...	0	0·31	−0·31	1·47	4·59	−3·12	Jessore.	
2	22	2	2	...	...	...	...	3	3	3	0	75	·423	1·1	0	...	...	0	0·39	−0·39	0·61	4·69	−4·08	Calcutta.	
...	16	14	...	...	...	..	...	1	9	6	+50	86	·513	2·8	0	...	...	0	0·55	−0·55	4·50	9·48	−4·98	Saugor Island.	
...	10	1	1	...	...	...	6	13	3	?	?	79	?	2·2	0	...	...	0	0·14	−0·14	2·41	5·40	−2·99	Krishnagar.	
...	20	1	...	...	...	...	...	10	11	?	?	66	?	1·0	0	...	...	0	0·27	−0·27	0·76	5·57	−4·81	Midnapore.	
6	...	...	...	...	...	...	18	6	2	?	?	75	?	1·3	0	...	...	0	0·17	−0·17	1·83	5·20	−3·37	Bankura† .	Central Bengal.
...	6	2	...	...	...	...	6	16	3*	?	?	72	?	1·3	0	...	...	0	?	?	2·13	?	?	Raniganj.†	
12	12	...	...	...	...	...	1	6	2	2	0	63	·350	2·3	0	...	...	0	0·16	−0·16	0·73	4·15	−3·42	Burdwan.	

* Mean of 29 days.
† Observations of 30 days.

Table

Abstract of Observations taken at 8 A.M. at 168 stations

Meteorological Province or District.	Station.	Height of Station in feet.	Pressure 8 A.M. in inches. 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.	Temperature of Air. 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.
Central Bengal—*concld.*	Naya Dumka	490	29·617	?	30·097	29·712	24th	29·503	31st	·209	57·7	77·6	?	52·6	?	65·1	?	25·0	81·1	1st	44·5	26th	36·6
	Berhampore	66·45	30·058	+·037	30·076	30·160	24th	29·954	31st	·206	59·2	78·1	+1·7	57·3	+2·2	67·7	+2·0	20·8	80·6	3 days	53·2	3 days.	27·4
	Rampur Boalia.	70	30·045	?	30·067	30·141	24th	29·934	31st	·207	60·2	77·9	?	55·1	?	66·5	?	22·8	80·8	8th	50·5	23rd & 31st.	30·3
	Malda	80	30·065*	?	30·100*	30·156	26th	29·989	31st	·167	61·1	79·9	?	54·3‡	?	67·2‡	?	25·6	82·8	7th & 8th	47·5	23rd	35·3
	Bogra†	61·48	30·032	?	30·049	30·111	24th	29·940	31st	·171	59·7	78·0	+1·2	54·2	+0·4	66·1	+0·8	23·8	80·3	3 days	49·2	31st	31·1
North Bengal	Dinajpur	117·59	30·001	+·037	30·080	30·095	24th	29·887	31st	·208	58·6	79·4	+3·2	51·0	+0·1	65·2	+1·7	28·4	82·1	5th & 7th	45·0	30th	37·1
	Rangpur	123	30·006	?	30·091	30·087	25th	29·882	31st	·205	58·1	78·4	?	52·2	?	65·3	?	26·2	81·6	5th	45·8	31st	35·8
	Jalpaiguri	283·7	29·834	+·043	30·088	29·908	25th	29·695	31st	·213	59·3	78·0	+2·8	52·5	+0·7	65·2	+1·8	25·5	80·4	1st & 6th	49·1	29th & 30th.	31·3
Orissa	Balasore	53·98	30·067	+·036	30·072	30·173	24th	29·981	31st	·192	60·6	80·4	+2·8	55·1	+1·1	67·8	+2·1	25·3	83·4	1st	46·4	27th	37·0
	False Point	20·60	30·094	+·031	30·058	30·206	25th	30·002	16th	·204	64·9	77·9	+0·8	60·5	+3·4	69·2	+2·1	17·4	81·4	4 days	51·0	25th	30·4
	Cuttack	80	30·047	+·048	30·074	30·151	24th	29·961	16th	·190	64·4	82·0	0	59·0	+1·0	70·5	+0·5	23·0	85·3	1st	50·9	27th	34·4
	Shortt's Island.*	?	30·100	?	?	30·213	24th	29·997	16th	·216	72·3	76·7	?	68·8	?	72·8	?	7·9	80·4	3rd	62·7	28th to 31st.	17·7
	Puri	9·23	30·097	?	30·046	30·215	24th	29·994	16th	·221	67·9	81·6	?	63·1	?	72·4	?	18·5	84·7	18th	55·6	27th	29·1
V.—Gangetic Plain and Chota Nagpur.		...	...	+·050	...	...	...	...	...	...	...	76·2	+1·3	49·9	0	63·0	+0·7	26·3	...	...	...	...	37·4
Chota Nagpur	Hazaribagh	2,007·12	28·066	+·042	30·109	28·153	24th	27·948	31st	·205	58·0	73·4	+2·0	50·5	+0·4	61·9	+1·2	22·9	76·8	16th	45·3	11th	31·5
	Ranchi	2,128·14	27·937	?	30·096	28·065	25th	27·828	31st	·237	58·8	73·2	?	50·2	?	61·7	?	23·0	76·5	18th	43·5	11th	33·0
	Chaibassa	760	29·356	+·071	30·100	29·480	24th	29·265	31st	·215	62·8	78·5	+1·4	51·8	+0·2	65·2	+0·8	26·7	82·6	3rd	44·9	27th	37·7
Bihar (South)	Gaya	374·5	29·778	+·063	30·131	29·869	24th	29·629	31st	·240	57·4	76·5	+0·8	51·4	+0·5	64·0	+0·7	25·1	81·9	1st	45·9	26th & 27th.	36·0
	Dehri	351·14	29·797	?	30·125	29·905	24th	29·668	31st	·237	58·5	76·3	?	52·7	?	64·5	?	23·6	82·3	1st	47·5	26th	34·8
	Patna	182·84	29·970	+·041	30·116	30·074	24th	29·847	31st	·227	60·1	74·7	+0·7	52·0	+1·1	63·4	+0·9	22·7	80·4	1st	45·4	25th	35·0
	Arrah	190·02	29·952	?	30·108	30·068	24th	29·812	31st	·256	56·0	76·6	?	?	?	?	?	?	82·0	1st	?	?	?
	Buxar	239·22	29·917	?	30·126	30·028	24th	29·779	31st	·249	59·8	76·3	?	50·5	?	63·4	?	25·8	80·4	2nd & 3rd.	44·4	25th	36·0
Bihar (North)	Purnea	125	30·010	+·053	30·098	30·106	24th	29·884	31st	·222	63·3	78·7	+2·6	47·8	−2·1	63·3	+0·3	30·9	82·3	6th	43·3	30th	39·0
	Bhagalpur	159·78	29·973	?	30·095	30·085	24th	29·838	31st	·247	58·8	78·0	?	51·3	?	64·7	?	26·7	81·8	1st	44·3	25th	37·5
	Darbhanga	166·32	29·988	+·057	30·119	30·121	26th	29·850	31st	·271	57·6	77·3	+3·4	52·7	−1·5	65·0	+1·0	24·6	83·1	1st	47·7	25th	35·4
	Muzaffarpur	178·42	29·953	?	30·097	30·062	24th	29·816	31st	·246	55·1	76·5§	?	49·7	?	62·5§	?	26·8	81·7	10th	43·8	25th	37·9
	Motihari	223·61	29·897	?	30·094	29·998	24th	29·751	31st	·247	54·8	77·7	?	46·6	?	62·2	?	31·1	81·2	1st	40·0	24th	41·2
	Chapra	181·3	29·962‡	?	30·108‡	30·082	24th	29·818	31st	·264	57·0	76·9	?	52·0	?	64·5	?	24·9	81·8	1st	46·3	26th	35·5
N.-W. P. (Eastern Districts).	Benares	266·97	29·879	+·046	30·122	29·991	24th	29·749	31st	·242	53·1	74·8	−0·4	47·2	−0·5	61·0	−0·5	27·6	79·1	4th	40·4	27th	38·7
	Allahabad	309·28	29·835	+·042	30·122	29·954	24th	29·691	31st	·263	54·8	76·4	+1·7	47·7	+0·4	62·1	+1·1	28·7	81·5	4th	39·9	27th	41·6
N.-W. P. (East Submontane).	Gorakhpur	255·93	29·871	+·040	30·103	29·984	24th	29·734	31st	·250	57·4	74·4	−0·3	51·5	+1·7	63·0	+0·7	22·9	78·0	1st	45·3	26th	32·7
Oudh (South)	Lucknow	369·7	29·764	+·040	30·123	29·865	24th	29·590	31st	·275	52·2	76·3	+0·7	45·5	+0·2	60·9	+0·5	30·8	81·2	3rd	37·9	26th & 27th.	43·3
N.-W. Provinces (Central).	Cawnpore	415·57	29·722	?	30·129	29·843	24th	29·582	31st	·261	54·1	75·2	?	46·8	?	61·0	?	28·4	85·0	2nd	39·0	26th	46·0
Upper Sub-Himalayas		...	...	+·047	...	...	...	...	...	...	..	72·3	+0·4	43·2	+0·1	57·8	+0·3	29·1	..	...	...	...	40·1
N.-W. Provinces (Submontane).	Bareilly	568·47	29·540	+·042	30·119	29·649	24th	29·370	31st	·279	50·1	73·0	+0·2	46·4	+1·0	59·7	+0·6	26·6	76·2	6 days	39·7	26th	36·5
	Dehra Dun	2,233·2	27·843	?	30·169	27·937	24th	27·664	31st	·273	49·1	71·8	?	45·8	?	58·8	?	26·0	75·0	2nd	41·0	10th	34·0
	Roorkee	886·63	29·226	+·059	30·163	29·325	24th	29·068	31st	·257	45·5	73·6	+1·0	43·4	+0·2	58·5	+0·6	30·2	77·8	6th	36·9	25th	40·9
	Meerut	737·48	29·382	+·057	30·150	29·491	24th	29·225	31st	·266	47·2	73·1	−0·2	44·2	+0·5	58·7	+0·2	28·9	77·2	4 days	38·0	26th	39·2
Punjab (Central)	Delhi	717·81	29·406	+·050	30·144	29·525	24th	29·241	31st	·284	52·3	72·1	−2·7	48·0	−0·4	60·1	−1·6	24·1	78·1	1st	41·7	26th	36·4
	Lahore	702·2	29·420	+·050	30·160	29·537	24th	29·300	31st	·237	45·3	72·9	+0·9	40·4	−1·3	56·7	−0·2	32·5	77·3	1st & 2nd	34·2	26th & 27th.	43·1

* Mean of 30 days.
† Observations of 28 days.
‡ Mean of 29 days.
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I—*continued.*

in India, Burma, etc., in December 1891—continued.

Wind Direction. Number of winds from									Wind Velocity.			Hygrometry, 8 A.M.			Rainfall.									Station.	Meteorological Province or District.
Calm	N.	NE.	E.	SE.	S.	SW.	W.	NW.	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 October to 31st December 1891.	Normal rainfall for period 1st October to 31st December.	Variation from normal of period.		
10	2	1	1	...	...	...	1	16	2	P	P	74	P	0	0	...	...	0	0·21	− 0·21	0·70	4·48	− 3·78	Naya Dumka.	Central Bengal—*concld.*
1	11	1	...	...	...	1	11	6	2	2	0	87	·441	1·8	0	...	...	0	0·21	− 0·21	1·62	5·29	− 3·67	Berhampore.	
...	28	2	...	...	...	...	1	...	3	P	P	80	P	0·9	0	...	...	0	0·08	− 0·08	3·22	5·09	− 1·87	Rampur Boalia—Malda.*	
...	...	...	...	...	...	2	...	29	4	P	P	82	P	0·3	0	...	...	0	0·32	− 0·32	1·41	4·77	− 3·36		
2	10	11	...	...	...	...	1	4	1	P	P	83	·428	0	0	...	...	0	0·10	− 0·10	4·60	4·38	+ 0·22	Bogra.‡	
...	7	9	1	...	...	1	7	6	1	P	P	83	·412	0·7	0	...	...	0	0·06	− 0·06	0·53	5·20	− 4·67	Dinajpur	North Bengal.
4	5	5	17	...	...	...	...	...	2	P	P	89	P	0·1	0	...	...	0	0·11	− 0·11	10·52	5·06	+ 5·46	Rangpur.	
7	21	1	...	..	...	...	...	2	2	P	P	86	·435	0	0	...	...	0	0·13	− 0·13	1·44	5·69	− 4·25	Jalpaiguri.	
...	10	...	...	...	...	...	1	20	3	P	P	78	·417	0·3	0	...	...	0	0·44	− 0·44	3·19	7·52	− 4·33	Balasore	Orissa.
...	18	...	...	...	...	...	2	11	8	6	+ 33	80	·500	2·8	0	...	...	0	1·20	− 1·20	12·29	12·11	+ 0·18	False Point.	
13	3	4	...	...	...	...	8	3	2	1	+100	70	·431	2·6	0	...	...	0	0·49	− 0·49	6·66	5·89	+ 0·77	Cuttack.	
...	22	3	...	...	...	...	2	3	13	P	P	68	·544	1·7	0	...	...	0	P	P	10·10	P	P	Shortt's Island.	
3	24	1	1	...	...	...	...	2	8†	P	P	69	P	2·3	0	...	...	0	0·71	− 0·71	16·53	11·51	+ 5·02	Puri.	
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0	0·23	−0·23	...	...	...	**V.—Gangetic Plain and Chota Nagpur.**	
13	2	...	1	...	2	...	8	5	4	5	− 20	67	·327	1·6	0	...	...	0	0·31	− 0·31	0·42	3·74	− 3·32	Hazaribagh.	Chota Nagpur.
14	2	...	...	...	...	2	5	8	4	P	P	67	P	1·8	0	...	...	0	0·20	− 0·20	0·64	3·61	− 2·97	Ranchi.	
8	2	1	2	...	1	9	7	1	1	P	P	69	·398	1·1	0	...	...	0	0·33	− 0·33	1·58	3·65	− 2·07	Chaibassa.	
...	...	...	1	...	25	...	5	...	5	1	+400	72	·347	2·3	0	...	...	0	0·31	− 0·31	1·81	3·17	− 1·36	Gaya	Bihar (South).
...	...	...	...	...	10	21	...	...	4	P	P	76	P	0·3	0	...	...	0	P	P	0·50	P	P	Dehri.	
2	...	...	...	...	...	...	25	4	3	2	+ 50	71	·369	0·5	0	...	...	0	0·21	− 0·21	1·72	3·54	− 1·82	Patna.	
...	...	...	1	1	2	6	18	3	2	P	P	84	P	0·6	0	...	...	0	0·14	− 0·14	1·51	3·23	− 1·72	Arrah.	
...	1	...	...	...	...	3	17	10	3	P	P	71	P	0·5	0	...	...	0	0·20	− 0·20	1·20	3·54	− 2·34	Buxar.	
16	1	...	...	...	...	5	6	3	1	1	0	89	·368	0·4	0	...	...	0	0·16	− 0·16	0·98	3·99	− 3·01	Purnea	Bihar (North).
30	...	...	...	...	...	1	...	...	0	P	P	76	P	0·5	0	...	...	0	0·09	− 0·09	0·20	4·13	− 3·93	Bhagalpur.	
9	3	1	1	...	...	4	6	7	2	2	0	84	·403	0·3	0	...	...	0	0·15	− 0·15	1·02	3·81	− 2·79	Darbhanga.	
12	1	...	...	...	...	4	12	2	2	P	P	92	P	0·2	0	...	...	0	0·07	− 0·07	0·93	3·00	− 2·07	Muzufferpur	
5	...	...	2	1	...	3	13	7	3	P	P	90	P	0·4	0	...	...	0	0·14	− 0·14	3·98	3·66	+ 0·32	Motihari.	
7	...	...	...	...	3	18	3	...	2	P	P	87	P	0	0	...	...	0	0·09	− 0·09	0·34	3·17	− 2·83	Chupra.	
23	...	...	...	...	1	4	3	...	2	2	0	90	·370	0·7	0	...	...	0	0·33	− 0·33	3·63	3·17	+ 0·46	Benares	N.-W. P. (Eastern Districts).
19	1	...	...	...	1	1	6	3	2	2	0	81	·354	0·4	0	...	...	0	0·43	− 0·43	2·47	2·22	+ 0·25	Allahabad.	
12	3	...	...	...	3	1	9	3	1	1	0	81	·388	0·3	0	...	...	0	0·21	− 0·21	7·51	4·07	+ 3·44	Gorakhpur	N.-W. P. (East Submontane).
16	5	2	...	...	...	...	6	2	2	2	0	85	·337	0	0	...	...	0	0·40	− 0·40	1·95	1·13	+ 0·82	Lucknow.	Oudh (South).
6	3	...	1	...	4	6	8	3	2	P	P	85	·360	0·6	0	...	...	0	0·30	− 0·30	0·35	1·40	− 1·05	Cawnpore	N.-W. Provinces (Central).
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0	0·43	−0·43	...	...	...	**VI.—Upper Sub-Himalayas.**	
28	...	...	...	...	...	...	...	3	0	2	−100	86	·316	0·6	0	...	...	0	0·38	− 0·38	0·24	1·55	− 1·31	Bareilly	N.-W. Provinces (Submontane).
26	2	...	1	1	1	...	...	...	1	2	− 50	78	·276	1·6	0	...	...	0	0·73	− 0·73	3·48	1·81	+ 1·67	Dehra Dun.	
23	...	...	...	1	2	...	2	3	1	1	0	89	·273	1·1	0	...	...	0	0·29	− 0·29	2·57	0·93	+ 1·64	Roorkee.	
21	...	...	...	...	...	...	9	1	1	2	− 50	79	·263	0·4	0	...	...	0	0·34	− 0·34	2·94	1·02	+ 1·92	Meerut.	
18	...	...	...	...	...	3	10	...	1	3	− 66	64	·256	0·8	0	...	...	0	0·38	− 0·38	0·56	0·62	− 0·06	Delhi	Punjab (Central).
29	...	...	...	...	...	...	2	...	1	1	0	80	·247	1·7	0	...	...	0	0·19	− 0·19	1·12	0·48	+ 0·64	Lahore.	

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

Table

Abstract of Observations taken at 8 A.M. at 168 stations

Meteorological Province or District.	Station.	Height of Station in feet.	Pressure 8 A.M. in inches. 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.	Temperature of air. 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.
Punjab (Submontane).	Ludhiana	811·86	29·289	+·043	30·142	29·402	24th	29·160	31st	·242	47·0	72·8	+1·2	41·9	−1·1	57·4	+0·1	30·9	76·7	4 days	35·8	26th	40·9
Punjab (North)	Sialkot	829·47	29·263	+·047	30·140	29·370	24th	29·126	31st	·244	46·8	71·5	+0·9	42·4	+0·8	57·0	+0·9	29·1	75·5	1st & 7th	31·2	25th	44·3
	Rawalpindi	1,648·9	28·433	+·029	30·172	28·535	24th	28·309	31st	·226	41·0	70·1	+2·2	36·6	+0·7	53·4	+1·5	33·5	75·0	1st	29·4	25th	45·6
VII.—Indus Valley and N.-W. Rajputana.		...	...	**+·040**	...	...	...	...	...	...	...	**78·3**	**+2·1**	**46·1**	**+0·9**	**62·3**	**+1·5**	**32·1**	...	...	...	...	**43·4**
Punjab (West)	Peshawar	1110·4	29·037	+·045	30·180	29·156	24th	28·938	31st	·218	44·7	76·5	+2·5	40·2	+2·5	55·4	+2·5	30·3	75·6	12th	33·9	27th	41·7
	Khushab	611·51	29·504	?	30·149	29·611	24th	29·385	31st	·226	43·4	76·6†	?	37·3	?	58·4†	?	39·3	76·9	2nd, 11th & 13th.	31·1	23rd & 27th.	47·8
	Montgomery	558·46	29·579	?	30·153	29·696	24th	29·474	16th	·222	49·5	75·5	?	42·5	?	59·0	?	33·0	81·3	5th	35·3	26th	46·0
	D. I. Khan	572·56	29·555	+·033	30·160	29·630	24th	29·463	16th	·167	42·8	75·3	+2·2	39·1	−0·6	57·2	+0·8	35·2	78·7	9 days	32·0	26th	46·7
	Mooltan	420·19	29·732	+·051	30·154	29·870	24th	29·623	16th	·247	51·0	76·0	+1·9	45·1	+2·4	60·6	+2·2	30·9	80·3	5 days	38·2	26th & 27th.	42·1
	Sirsa	661·61	29·459	+·047	30·147	29·594	24th	29·346	31st	·248	47·3	77·3	+2·3	42·7	+0·8	60·0	+1·6	34·6	84·0	1st	35·2	25th & 26th.	48·8
Sind and Cutch	Jacobabad	185·9	29·970	+·041	30·133	30·107	24th	29·858	16th	·249	48·9	78·7	+1·9	43·1	−0·1	60·9	+0·9	35·6	84·5	3 days	38·1	9th	46·4
	Hyderabad	117·43	30·033	+·033	30·111	30·144	24th	29·935	16th	·209	57·5	80·2	+1·3	52·9	+0·5	66·6	+0·9	27·3	88·2	3rd	47·3	17th	40·9
	Kurrachee	49	30·100	+·032	30·102	30·182	24th	30·007	16th	·175	61·5	82·6	+2·4	56·8	+1·1	69·8	+1·8	25·8	88·5	2nd	53·0	13th & 15th.	35·5
	Bhuj	394·9	29·700	?	30·065	29·755	25th	29·642	16th	·113	65·9	85·2	?	57·3	?	71·3	?	27·9	90·2	1st & 3rd	52·3	14th	37·9
Rajputana (West)	Bickaneer*	743·5	28·860	?	29·607	28·945	1st	28·798	18th	·147	58·8	77·3	?	51·1	?	64·2	?	26·2	83·7	1st	45·0	26th, 28th & 29th.	38·7
	Pachpadra	380	29·758	?	30·120	29·851	25th	29·699	5th	·152	58·4	83·9	?	45·3	?	64·7	?	38·6	89·6	1st, 2nd & 3rd.	40·9	11th	48·7
VIII.—East Rajputana, Central India and Guzerat.		...	...	**+·047**	...	...	...	...	...	...	...	**80·6**	**+1·6**	**49·7**	**−0·5**	**64·8**	**+0·5**	**31·7**	...	...	...	...	**43·1**
Rajputana (East)	Jeypore	1430·6	28·685	+·040	30·170	28·813	24th	28·581	31st	·232	54·5	79·9	+2·2	48·1	0	64·0	+1·1	31·8	85·1	3 days	42·2	11th	42·9
	Sambhar	1253·52	28·842	+·029	30·154	28·964	24th	28·764	31st	·200	49·5	78·2	+2·9	44·1	−1·7	61·2	+0·6	34·1	83·9	1st	37·5	25th	46·4
	Ajmere	1611	28·512	+·054	30·195	28·637	24th	28·437	31st	·200	51·2	79·6	+3·4	45·9	+2·0	62·7	+2·7	33·7	85·0	1st & 2nd	41·4	2 days	43·6
	Deesa	465·5	29·645	+·038	30·092	29·721	25th	29·579	31st	·142	62·5	89·6	+4·7	54·2	+2·4	71·9	+3·6	35·4	94·8	1st & 2nd	49·5	14th & 16th.	45·3
Kathiawar	Rajkot	428·83	29·666	+·035	30·068	29·744	25th	29·617	16th	·127	63·4	87·2	+1·7	52·6	−0·7	69·9	+1·2	34·6	92·9	15th	46·0	13th, & 16th.	46·9
	Veraval	?	30·067	?	30·027	30·141	25th	30·018	16th	·123	69·4	?	?	60·4	?	?	?	?	?	...	52·8	13th	?
	Bhavnagar	?	29·705	?	29·693	29·760	25th	29·658	16th & 17th.	·102	61·6	82·6	?	56·4	?	69·5	?	26·2	86·4	1st & 2nd.	50·0	13th	36·4
Central India	Nowgong	757·04	29·381	+·054	30·156	29·490	24th	29·270	31st	·220	51·9	74·1	−1·2	43·6	−2·1	58·8	−1·7	30·5	80·0	3rd	36·5	26th	43·5
	Sutna	1,040·1	29·075	+·045	30·151	29·191	24th	28·969	31st	·222	51·9	74·2	−0·4	43·3	−2·8	58·8	−1·6	30·9	79·0	4th	37·1	25th	41·9
	Indore	1,823·2	28·270	+·061	30·130	28·359	24th	28·202	16th	·157	60·4	79·5	+1·3	45·4	−3·4	62·5	−1·1	34·1	83·5	3rd	39·1	12th	44·4
	Neemuch	1,630	28·473	+·046	30·153	28·582	24th	28·410	5th	·172	57·4	79·7	+1·9	49·0	+0·1	64·4	+1·0	30·7	84·8	3 days	42·9	30th	41·9
Guzerat	Surat	36	30·062	+·043	30·043	30·146	25th	29·996	16th	·150	65·8	88·3	+1·8	57·3	+0·6	72·9	+1·2	31·0	93·2	24th.	50·1	16th	43·1
N.-W. P. (West)	Agra	555·44	29·602	+·059	30·165	29·726	24th	29·470	31st	·256	50·7	75·9	−0·1	46·2	−1·8	61·1	−1·0	29·7	81·6	1st & 2nd	39·7	26th	41·9
	Jhansi	840·13	29·281	+·064	30·135	29·412	24th	29·176	31st	·236	57·2	79·1	+1·2	49·9	−0·3	64·5	+0·5	29·2	85·4	3rd	43·9	26th & 28th.	41·5
IX.—Deccan	...	...	...	**+·050**	...	...	...	...	...	...	...	**82·3**	**+1·3**	**53·0**	**−0·6**	**67·7**	**+0·4**	**29·3**	...	...	...	...	**39·1**
Bombay (Deccan)	Belgaum	2,524	27·505	+·032	30·010	27·581	25th	27·452	22nd	·129	67·5	82·9	+1·8	59·1	+1·1	71·0	+1·5	23·8	85·8	3 days	54·4	17th	31·4
	Sholapur	1,589·7	28·492	+·058	30·076	28·577	24th	28·439	16th	·138	67·7	87·3	+2·7	56·9	0	72·1	+1·4	30·4	91·2	22nd	48·6	26th	42·6
	Poona	1,840·37	*28·240	+·052	30·101	28·332	25th	28·184	16th	·148	62·5	85·9	+2·8	51·2	+2·7	68·6	+2·8	34·7	90·0	22nd	46·0	12th	44·0
Khandeish	Malegaon	1,430·12	28·670	+·054	30·131	28·763	24th	28·602	16th	·161	58·2	84·2	+1·4	48·0	−2·0	66·1	−0·3	36·2	87·9	1st	39·8	12th	48·1
	Ahmednagar	2,151·62	27·928	?	30·111	28·013	25th	27·866	16th	·147	60·5	82·5	?	48·7	?	65·6	?	33·8	85·8	23rd	42·4	12th & 31st.	43·4
Berar	Akola	930	29·180	+·055	30·121	29·270	24th	29·105	16th	·165	56·3	83·1	+1·4	46·9	−2·7	65·1	−0·7	36·2	87·0	23rd	41·2	12th & 13th.	45·8
	Amraoti	1,215·5	28·877	+·045	30·100	28·972	24th	28·804	16th	·168	63·4	83·1	+1·8	56·3	+1·4	69·7	+1·6	26·8	86·3	1st	51·9	12th	34·4

* Observations of 30 days.
† Mean „ 15 „

I—*continued.*

in India, Burma, etc., in December 1891—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 October to 31st December 1891.	Normal rainfall for period from 1st October to 31st December.	Variation from normal of period.	Station.	Meteorological Province or District.
23	...	...	2	1	...	...	4	1	1	1	0	78	·251	3·0	0	...	...	0	0·52	−0·52	1·48	1·10	+ 0·38	Ludhiana .	Punjab (Submontane).
31	...	...	...	...	...	...	...	...	0	1	−100	74	·242	2·3	0	...	...	0	0·41	−0·41	0·96	0·72	+ 0·24	Sialkot .	Punjab (North).
19	1	...	...	...	1	2	5	3	1	1	0	79	·207	1·7	0	...	...	0	0·63	−0·63	1·08	1·55	− 0·47	Rawalpindi.	
...	...	...	...	...	..	...	...	...	...		...	...	...	...	...	...	...	0	0·09	−0·09	...	...	...	VII.—Indus Valley and N.-W. Rajputana.	
22	...	...	...	...	4	2	2	1	2	2	0	70	·209	2·3	0	...	...	0	0·15	−0·15	0·57	0·65	− 0·08	Peshawar .	Punjab (West).
24	1	4	1	...	...	1	...	...	1	?	?	54	·157	1·9	0	...	...	0	0·16	−0·16	0·11	0·56	− 0·45	Khushab .	
18	2	4	2	3	...	...	2	...	2	?	?	63	·228	2·1	0	...	...	0	0·20	−0·20	0	0·33	− 0·33	Montgomery.	
22	3	...	1	...	1	...	3	1	1	1	0	70	·195	1·1	0	...	...	0	0·08	−0·08	0	0·26	− 0·26	D. I. Khan.	
11	...	5	...	2	...	5	...	8	1	1	0	67	·255	1·8	0	...	...	0	0·07	−0·07	0	0·14	− 0·14	Mooltan.	
13	3	...	1	1	6	1	5	1	2	2	0	76	·252	2·2	0	...	...	0	0·30	−0·30	0·06	0·52	− 0·46	Sirsa.	
26	1	...	2	...	...	...	...	2	1	2	−50	59	·211	1·8	0	...	...	0	0	0	0	0	0	Jacobabad .	Sind and Cutch.
...	...	30	...	...	...	1	...	...	7	7	0	48	·227	3·8	0	...	...	0	0	0	0	0·06	− 0·06	Hyderabad.	
...	1	29	1	...	...	...	...	...	10		+11	55	·307	1·6	0	...	...	0	0	0	0	0	0	Kurrachee.	
20	4	2	...	1	...	2	...	2	5	5	0	49	·320	0·5	0	...	...	0	0·03	−0·03	0	0·85	− 0·85	Bhuj.	
...	7	10	1	2	1	4	1	4	3	3	0	43	·182	2·2	0	...	...	0	0·02	−0·02	0	0·16	− 0·16	Bickaneer* .	Rajputana (West).
10	2	7	7	3	1	...	...	1	4	2	+100	35	·165	2·0	0	...	...	0	0·03	−0·03	0	0·08	− 0·08	Pachpadra.	
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0	0·21	−0·21	...	...	...	VIII.—East Rajputana, Central India and Guzerat.	
12	2	1	2	3	2	3	4	2	2	3	−33	57	·245	1·8	0	...	...	0	0·07	−0·07	0·69	0·51	+ 0·18	Jeypore .	Rajputana (East).
23	3	2	2	...	1	...	...	...	3†	4	−25	58	·208	1·0	0	...	...	0	0·22	−0·22	0·33	0·52	− 0·19	Sambhar.	
24	...	...	...	2	2	1	...	2	1	1	0	69	·258	1·4	0	...	...	0	0·12	−0·12	0·12	0·44	− 0·32	Ajmere.	
...	...	8	23	...	...	...	...	...	8‡	8	0	34	·194	1·9	0	...	...	0	0·07	−0·07	0	0·55	− 0·55	Deesa.	
14	...	3	9	5	...	...	...	...	4	5	−20	58	·342	0·5	0	...	...	0	0	0	0·41	0·74	− 0·33	Rajkot .	Kathiawar.
14	9	7	1	...	...	...	...	...	6	?	?	43	·311	0·6	0	...	...	0	?	?	0·05	?	?	Veraval.	
...	1	2	...	...	...	8	15	5	6	?	?	71	·391	0·9	0	...	...	0	?	?	0·02	?	?	Bhavnagar.	
12	3	1	3	1	...	...	4	7	1	1	0	75	·292	0·6	0	...	...	0	0·73	−0·73	1·96	2·15	− 0·19	Nowgong. .	Central India.
9	12	3	...	...	...	...	1	6	2	4	−50	73	·283	0·1	0	...	...	0	0·59	−0·59	3·28	3·09	+ 0·19	Sutna.	
13	1	3	7	5	...	1	1	...	2	2	0	48	·251	0	0	...	...	0	0·28	−0·28	0·72	2·46	− 1·74	Indore.	
6	2	5	14	4	...	...	...	...	5	8	−38	49	·234	0·2	0	...	...	0	0·20	−0·20	0·27	0·99	− 0·72	Neemuch.	
...	4	21	4	...	...	...	...	2	?	5	?	59	·377	0·6	0	...	...	0	0	0	0·97	0·45	+ 0·52	Surat . .	Guzerat.
9	...	...	...	...	...	1	...	21	2	3	−33	76	·285	1·1	0	...	...	0	0·15	−0·15	0·97	0·60	+ 0·37	Agra . .	N.-W. P. (West).
20	2	...	...	...	1	3	...	5	1	2	−50	58	·276	0·4	0	..	...	0	0·14	−0·14	0·29	1·01	− 0·72	Jhansi.	
...	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·02	0·57	−0·56	...	...	...	IX.—Deccan.	
1	...	5	22	3	...	...	...	...	?	12	?	51	·349	1·1	1	...	...	0·35	0·07	+0·28	9·35	7·23	+ 2·12	Belgaum .	Bombay (Deccan).
4	...	7	10	6	1	...	1	2	8	7	+14	44	·303	1·3	0	...	...	0	0·72	−0·72	5·78	6·16	− 0·38	Sholapur.	
24*	...	2	4	...	...	...	...	...	5	6	−17	43	·249	1·1	0	...	...	0	0·38	−0·38	3·26	5·91	− 2·65	Poona.	
6	2	...	...	...	...	4	11	8	4	3	+33	48	·236	1·0	0	...	...	0	0·48	−0·48	1·79	4·75	− 2·96	Malegaon .	Khandeish.
6	1	2	4	2	3	1	5	7	4	?	?	65	·351	0·8	0	...	...	0	0·16	−0·16	2·03	3·98	− 1·95	Ahmednagar.	
16	4	1	6	4	...	...	...	...	3	3	0	58	·266	0·4	0	...	...	0	1·28	−1·28	1·50	5·72	− 4·22	Akola . .	Berar.
...	...	18	13	...	...	...	...	...	5	3	+66	42	·248	0·6	0	...	...	0	1·00	−1·00	3·34	4·58	− 1·24	Amraoti .	

* Observations of 30 days. † Mean of 27 days. ‡ Mean of 26 days.

Table

Abstract of Observations taken at 8 A.M. at 168 stations

Meteorological Province or District.	Station.	Height of Station in feet.	Pressure 8 A.M. in inches. 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.	Temperature of Air. 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.
Central Provinces (West).	Khandwa	1,043·71	29·071	+·074	30·135	29·167	25th	29·010	16th	·157	57·5	81·5	+0·2	46·2	−2·4	63·9	−1·1	35·3	85·7	22nd	40·6	12th & 13th.	45·1
	Hoshangabad	1,020	29·109	+·049	30·157	29·211	24th	29·023	16th	·188	53·7	78·1	−0·6	49·5	−0·9	63·8	−0·8	28·6	82·3	4th	44·3	27th	38·0
	Nagpur	1,025	29·080	+·053	30·111	29·173	24th	29·005	16th	·168	62·9	80·7	+0·6	52·4	−0·6	66·6	0	28·3	83·8	3 days	48·2	26th & 31st.	35·6
Central Provinces (Central).	Seoni	2,030	28·050	+·038	30·158	28·155	24th	27·978	16th	·177	57·5	76·9	−0·1	46·9	−2·0	61·9	−1·1	30·0	81·1	22nd	43·0	11th & 25th.	38·1
	Jubbulpore	1,327·02	28·786	+·061	30·168	28·890	24th	28·718	31st	·172	49·9	75·9	+0·1	42·4	−2·6	59·2	−1·3	33·5	79·4	4th	36·9	25th	42·5
	Saugor	1,751·5	28·332	+·042	30·148	28·439	24th	28·252	16th	·187	55·8	78·0	+2·4	49·1	−1·8	63·6	+0·3	28·9	82·3	3rd & 4th	43·6	11th & 12th.	38·7
Central Provinces (East).	Raipur	959·7	29·137	+·048	30·112	29·240	24th	29·069	16th	·171	60·5	79·0	+1·1	53·1	+0·1	66·1	+0·6	25·9	83·0	2nd & 3rd	47·9	5 days	35·1
Hyderabad (North).	Aurangabad	?	28·239	?	?	28·325	24th & 25th.	28·174	16th	·151	64·7	83·2	?	51·7	?	67·5	?	31·5	87·0	3rd	45·2	12th	41·8
	Indur		?	?	?	?	...	?	...	?	62·8	82·0	?	51·0	?	65·5	?	31·0	87·6	22nd	44·2	7th	43·4
	Beeder		27·887	?	?	27·964	24th	27·807	4th	·157	64·6	80·5	?	59·9	?	70·2	?	20·6	84·6	22nd	55·2	11th	29·4
Hyderabad (South).	Gulburga	?	28·562	?	?	28·651	24th	28·506	16th	·145	66·4	85·3	?	57·7	?	71·5	?	27·6	88·6	21st	49·2	16th	39·4
	Raichur*		29·682	?	?	29·769	25th	29·626	16th	·143	68·8	85·9	?	64·1	?	75·0	?	21·8	89·6	14th	60·2	16th	29·4
	Secunderabad	1,786·69	28·287	+·039	30·080	28·375	24th	28·220	16th	·155	65·5	84·6	+3·2	58·0	+1·7	71·3	+2·5	26·6	88·6	14th	50·6	31st	38·0
	Hyderabad (Deccan).		28·386	?	30·073	28·570	25th	28·312	16th	·258	65·0	83·4	?	57·5	?	70·5	?	25·9	88·5	15th	49·9	31st	38·6
	Kamamet		29·720	?	?	29·818	24th	29·640	15th	·178	66·1	87·4	?	60·4	?	73·9	?	27·0	91·2	15th	53·2	30th	38·0
X.—West Coast		...	...	+·022	...	...	...	...	...	...	...	89·1	+2·8	70·1	+0·3	79·6	+1·6	18·9	...	...	...	...	26·4
Konkan	Bombay	37	30·029	+·034	30·006	30·131	25th	29·973	16th	·158	73·3	86·4	+2·3	70·5	+1·1	78·5	+1·7	15·9	90·4	1st	67·0	16th & 17th.	23·4
	Ratnagiri	110	29·919	+·037	29·967	30·004	25th	29·857	22nd	·147	79·6	92·6	+3·4	65·0	−2·0	78·8	+0·7	27·6	95·4	21st	59·9	18th & 20th.	35·5
	Mormugoa	?	29·964	?	29·958	30·040	25th	29·920	22nd	·120	74·0	89·8	?	71·2	?	80·5	?	18·6	92·0	3 days	66·3	16th	25·7
	Karwar	43·87	29·964	+·014	29·944	30·032	24th	29·915	11th	·117	71·5	90·5	+3·5	66·2	−0·2	78·4	+1·7	24·3	93·3	14th & 15th.	60·1	16th & 17th.	33·2
Malabar	Mangalore	25·60	29·981	+·016	29·940	30·048	24th	29·928	10th	·120	73·6	91·4	+3·0	72·3	+1·6	81·9	+2·3	19·1	93·8	19th & 22nd.	66·5	17th	27·3
	Calicut	26·58	29·967	+·008	29·925	30·030	24th	29·911	10th	·119	78·2	88·8	?	73·0	?	80·9	?	15·8	91·8	14th	69·1	2 days	22·7
	Cochin	10·38	29·979	+·023	29·919	30·048	24th	29·924	10th	·124	78·1	89·5	+1·7	74·1	+1·2	81·8	+1·5	15·4	92·3	3 days	72·2	4 days	20·1
	Trivandrum	?	29·636	?	29·914	29·701	24th	29·587	11th	·114	77·3	83·6	?	68·8	?	76·2	?	14·8	85·5	1st	62·5	6th	23·0
XI.—South India		...	...	+·027	...	...	...	...	...	...	...	84·2	+2·2	68·0	+2·0	76·1	+2·2	16·2	...	...	...	...	25·8
Madras (South)	Pamban	37	29·966	?	29·930	30·057	24th	29·907	13th	·150	77·6	81·7	?	75·5	?	78·6	?	6·2	84·3	22nd	72·7	20th	11·6
	Madura	446·60	29·560	+·024	29·950	29·617	24th	29·495	11th	·122	76·7	86·3	+0·4	72·6	+2·1	79·4	+1·3	13·7	90·8	16th & 20th.	68·6	26th	22·2
Madras (South Central).	Salem	939·91	29·107	+·022	30·005	29·200	24th	29·050	12th & 13th.	·150	75·1	88·3	+2·7	67·5	+2·5	77·9	+2·6	20·8	93·9	19th	62·9	4 days	31·0
	Coimbatore	1,347·64	28·662	+·013	29·980	28·760	24th	28·594	16th	·166	72·7	86·3	+1·9	67·8	+1·4	77·1	+1·7	13·5	91·8	16th	62·6	18th	29·2
Coorg	Mercara	3,780·7	26·288	?	29·964	26·334	25th	26·248	14th	·086	62·3	76·2	+1·8	59·0	+1·3	67·6	+1·6	17·2	79·3	21st	55·7	7th & 8th	23·6
Mysore	Bangalore	2,981·46	27·096	+·036	30·044	27·174	24th	27·052	16th	·122	66·7	80·1	+3·0	61·0	+2·3	70·6	+2·7	19·1	84·2	19th	56·9	17th & 28th.	27·3
Madras (East Coast, South).	Negapatam	30·5	29·977	+·016	29·938	30·068	24th	29·886	13th	·182	76·6	82·8	+2·0	72·6	+0·7	77·7	+1·4	10·2	87·7	15th	69·7	3 days	18·0
	Cuddalore	12·44	30·008	?	29·951	30·104	24th	29·930	12th	·174	75·2	82·4	?	71·8	?	77·1	?	10·6	85·2	5 days	68·2	30th	17·0
	Trichinopoly	254·78	29·762	+·010	29·955	29·857	24th	29·692	12th	·165	75·7	85·3	+1·2	71·5	+2·5	78·4	+1·9	13·8	90·0	19th	66·9	7th	23·1
	Madras	22	30·026	+·019	29·979	30·128	24th	29·945	12th	·183	76·2	83·5	+0·8	72·4	+2·3	77·9	+1·6	11·1	86·5	7th	66·0	30th	20·5
Madras (East Coast, Central).	Nellore	70·82	29·987	?	29·993	30·088	24th	29·913	15th	·175	75·0	84·2	?	70·4	?	77·3	?	13·8	87·2	3rd & 4th	65·1	28th	22·1
	Masulipatam	15·0	30·071	+·033	30·021	30·175	24th	29·988	15th	·187	73·6	86·2	+3·9	68·5	+2·1	77·4	+3·0	17·7	89·5	6th & 17th	61·2	30th & 31st.	28·3
Madras (Central)	Cuddapah	433·36	29·634	?	30·016	29·726	24th	29·572	16th	·154	76·1	88·4	?	68·8	?	78·6	?	19·6	93·6	2nd	61·4	27th	32·2
	Kurnool	923·45	29·143	?	30·038	29·230	24th	29·077	15th	·153	71·4	88·3	?	61·9	?	75·1	?	26·4	91·5	3 days	49·7	16th	41·8
	Bellary	1,474·63	28·583	+·050	30·039	28·672	24th	28·530	16th	·142	71·1	87·6	+2·4	63·3	+2·6	75·4	+2·5	24·3	90·4	3 days	57·6	16th	32·8
Madras (East Coast, North).	Rajahmundry	112	29·958	?	30·010	30·060	24th	29·865	15th	·195	71·9	89·0	?	66·7	?	77·9	?	22·3	92·0	4 days	59·9	28th	32·1
	Cocanada	26	30·055	?	30·016	30·157	24th	29·960	15th	·197	72·8	81·4	?	67·0	?	74·2	?	14·4	84·2	1st & 5th	59·2	30th	25·0

* Mean of 27 days.

I—*continued.*

in India, Burma, etc., in December 1891—continued.

Wind Direction. Number of winds from									Wind Velocity.			Hygrometry, 8 A.M.		Mean cloud amount.	Rainfall.									Station.	Meteorological Province or 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 October to 31st October 1891.	Normal rainfall for period from 1st October to 31st December.	Variation from normal of period.		
8	3	15	3	...	...	...	...	2	3	2	+ 50	56	·266	0·3	0	...	...	0	0·64	−0·64	1·65	2·96	−1·31	Khandwa .	Central Provinces (West).
...	1	13	15	1	1	...	...	...	5	2	+150	65	·272	0·4	0	...	...	0	0·87	−0·87	6·05	3·34	+2·71	Hoshangabad	
9	15	2	...	...	...	...	...	5	4*	3	+ 33	49	·283	0·8	0	...	...	0	0·66	−0·66	0·59	4·47	−3·88	Nagpur.	
6	12	10	1	1	...	...	...	1	1†	2	− 50	61	·293	1·0	0	...	...	0	0·85	−0·85	0·85	3·25	−2·40	Seoni .	Central Provinces (Central).
24	...	...	...	7	...	...	...	...	1	2	− 50	81	·295	0·5	0	...	...	0	0·54	−0·54	0·51	3·12	−2·61	Jubbulpore.	
1	7	9	6	7	1	...	...	...	1	2	− 50	64	·286	0·3	0	...	...	0	1·04	−1·04	1·95	3·24	−1·29	Saugor.	
7	11	9	1	...	...	1	1	1	3	3	0	60	·324	1·6	0	...	...	0	0·47	−0·47	1·15	3·49	−2·34	Raipur .	Central Provinces (East).
7	...	12	9	3	...	...	...	...	4*	?	?	46	·282	0·5	0	...	...	0	?	?	1·77	?	?	Aurangabad	Hyderabad (North).
6	3	4	1	5	9	...	...	3	5	?	?	65	·377	2·2	0	...	...	0	0·40	−0·40	?	?	?	Indur.	
...	1	14	14	2	...	...	...	...	7	?	?	65	·400	1·5	0	...	...	0	0·61	−0·61	?	?	?	Beeder.	
7	2	10	8	4	...	...	...	...	7	?	?	63	·408	2·0	0	...	...	0	0·40	−0·40	0§	0·40	−0·40	Gulburga.	Hyderabad (South).
...	...	11	11	5	...	...	...	...	9‡	?	?	59	·422	3·9	0	...	...	0	0·10	−0·10	?	?	?	Raichur.‖	
15	...	8	8	...	...	...	...	...	4	3	+ 33	64	·407	3·1	0	...	...	0	0·24	−0·24	0·83	4·79	−3·96	Secunderabad	
20	1	1	2	6	...	...	1	...	4*	?	?	66	·415	1·2	0	...	...	0	?	?	?	?	?	Hyderabad (Deccan).	
13	11	...	...	...	...	...	...	7	3	?	?	75	·486	1·2	0	...	...	0	?	?	?	?	?	Kamamet.	
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1·63	0·77	−0·09	...	...	...	**X.—West Coast.**	
...	...	14	17	...	...	...	...	...	11	10	+ 10	65	·537	0·6	0	...	...	0	0·21	−0·21	1·17	3·63	−2·46	Bombay .	Konkan.
3	...	1	26	1	...	...	...	...	11	9	+ 22	38	·382	0·4	0	...	...	0	0·11	−0·11	1·42	4·62	−3·20	Ratnagiri.	
...	...	8	19	4	...	...	...	...	9	?	?	66	·561	0·6	0	...	...	0	?	?	4·71	?	?	Mormugao.	
1	1	26	3	...	...	...	...	...	3	?	?	68	·526	0·5	0	...	...	0	0·14	−0·14	7·26	10·67	−3·41	Karwar.	
1	...	6	24	3	...	...	...	...	2	4	− 50	70	·645	1·1	0	...	...	0	0·39	−0·39	9·24	11·16	−1·92	Mangalore .	Malabar.
7	...	8	15	1	...	...	...	...	5	?	?	76	·739	2·0	2	...	...	1·20	1·65	+0·45	18·63	16·45	+2·18	Calicut.	
6	1	18	5	...	1	...	...	...	3	?	?	78	·764	3·2	2	...	...	2·85	2·10	+ 0·75	36·16	23·17	+12·99	Cochin.	
...	5	4	9	1	1	2	5	4	5	?	?	84	·793	4·7	12	...	...	8·98	?	?	32·34	?	?	Trivandrum.	
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3·85	2·71	+0·66	...	...	...	**XI.—South India.**	
...	17	9	1	...	...	...	...	4	10	?	?	85	·804	6·7	13	...	...	12·37	?	?	45·30	?	?	Pamban. .	Madras (South).
1	16	7	...	...	...	...	...	7	4	5	− 20	74	·688	4·5	3	...	...	0·79	2·44	−1·65	22·21	14·01	+8·20	Madura.	
8	1	16	5	...	...	...	...	1	3	4	− 25	79	·695	4·1	3	...	...	0·83	1·65	−0·82	5·59	13·60	−8·01	Salem .	Madras (South (Central).
...	10	9	3	1	2	...	6	...	5	3	+ 66	88	·707	6·1	2	...	...	0·75	1·57	−0·82	16·65	11·44	+5·21	Coimbatore.	
...	...	5	26	...	...	...	...	...	9	5	+ 80	84	·481	5·8	0	...	...	0	0·81	−0·81	12·86	14·48	−1·62	Mercara .	Coorg.
...	7	18	5	...	...	...	1	...	5	4	+ 25	76	·504	5·9	1	...	...	0·22	0·74	−0·52	8·08	12·12	−4·04	Bangalore .	Mysore.
...	5	10	2	...	...	...	3	11	13	7	+ 86	86	·789	7·7	18	...	...	26·72	12·84	+13·88	48·70	42·41	+6·29	Negapatam.	Madras (East Coast, South).
...	14	3	2	...	...	...	2	10	3	?	?	93	·821	5·2	15	...	...	19·12	6·52	+12·60	45·81	29·43	+16·38	Cuddalore.	
1	8	15	...	...	...	...	1	6	6	5	+ 20	81	·720	6·3	11	...	...	2·37	3·15	−0·78	15·37	14·86	+0·51	Trichinopoly.	
...	18	12	1	...	...	...	...	...	9	8	+ 13	86	·787	6·4	11	...	...	5·37	6·94	−1·57	23·56	36·23	−12·67	Madras.	
2	1	3	2	...	...	...	...	23	5	?	?	89	·779	6·7	6	...	...	3·95	3·69	+0·26	9·59	24·98	−15·39	Nellore .	Madras (East Coast, Central).
...	22	9	...	...	...	...	...	...	4	6	− 33	80	·664	2·5	0	...	...	0	1·25	−1·25	4·52	16·69	−12·17	Masulipatam	
...	3	13	9	5	1	...	...	...	?	?	?	73	·655	4·9	0	...	...	0·17	0·76	−0·59	3·44	12·52	−9·08	Cuddapah .	Madras (Central)
31	...	...	...	...	...	...	...	...	?	?	?	68	·527	0·9	0	...	...	0	0·31	−0·31	2·33	6·25	−3·92	Kurnool.	
22	...	...	5	4	...	...	...	...	4	3	− 33	69	·525	2·8	0	...	...	0	0·21	−0·21	1·90	6·36	−4·46	Bellary.	
3	22	5	...	...	...	...	...	1	?	?	?	69	·543	2·5	0	...	...	0	0·20	−0·20	1·15	8·67	−7·52	Rajahmundry	Madras (East Coast, North).
...	19	12	...	...	...	...	...	...	13	?	?	66	·532	1·1	0	...	...	0·08	0·95	−0·87	0·79	13·62	−12·83	Cocanada.	

* Mean of 30 days.
† „ „ 25 „

‡ Mean of 26 days.
‖ „ „ 27 „

§ Rainfall from 1st to 15th October wanting.

Table

Abstract of Observations taken at 8 A.M. at 168 stations

Meteorological Province or District.	Station.	Height of Station in feet.	Pressure 8 A.M. in inches. 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.	Temperature of Air. 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.
Madras (East Coast, North)—*contd.*	Vizagapatam	31	30·058	+·020	30·027	30·163	24th	29·947	15th	·216	76·3	80·5	+2·6	73·1	+5·7	76·8	+4·2	7·4	83·4	1st	62·9	2 days	20·5
	Gopalpur	21·45	30·097	+·051	30·058	30·211	24th	30·004	16th	·207	65·8	81·2	+4·0	61·1	−1·0	71·2	+1·5	20·1	84·7	4th	52·0	27th	32·7
XII.—Hill Stations		...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Beluchistan	Quetta	5,502·26	24·814	+·089	?	24·879	8th	24·735	21st	·144	34·7	61·5	+4·2	†29·4	+0·9	†45·4	+2·6	32·1	70·7	1st & 2nd	21·3	23rd	49·4
	Shebo	?	?	?	?	?	?	?	...	?	35·3	63·2	?	28·2	?	45·7	?	35·0	74·2	1st	14·3	17th	59·9
Northern India	Srinagar	5,203·7	25·073	?	?	25·177	25th	24·955	5th	·222	29·8	53·0	?	27·6	?	40·3	?	25·4	61·4	4th	22·6	26th	38·8
	Murree	6,343·86	23·964	+·059	?	24·014	1st	23·865	31st	·149	46·4	57·5	+3·5	41·9	+2·1	49·7	+2·8	15·6	69·1	3rd	34·2	22nd	34·9
	Simla	7,274	23·154	+·040	?	23·221	24th	23·032	31st	·189	45·3	52·0	−4·4	42·6	+2·6	47·4	−0·9	9·4	60·6	3rd	35·1	22nd	25·5
	Mussooree	?	23·679	?	?	23·742	8th	23·557	31st	·185	44·9	52·7	?	40·3	?	46·5	?	12·4	58·2	13th&14th	35·0	21st & 22nd.	23·2
	Ranikhet	6,068·75	24·210	+·055	?	24·279	24th	24·079	31st	·200	47·0	58·8	+0·8	43·4	+1·1	51·1	+1·0	15·4	66·1	13th	38·0	22nd	28·1
	Darjeeling	7,421·1	23·064	+·037	?	23·112	24th	22·932	31st	·180	42·0	50·7	+1·8	37·4	+0·6	44·1	+1·2	13·3	57·4	14th	33·3	23rd	24·1
	Kalimpong*	?	26·187	?	?	26·224	4th	26·139	10th	·085	52·3	65·9	?	49·3	?	57·6	?	16·6	68·6	10th	44·2	15th	24·4
Central India	Mount Abu	3,945	26·218	+·057	?	26·307	24th	26·155	31st	·152	61·6	70·4	+1·4	54·0	+1·7	62·2	+1·6	16·4	74·6	1st	51·0	29th, & 30th.	23·6
	Pachmarhi	3,511	26·640	+·060	?	26·726	24th	26·566	16th	·160	61·5	70·1	+1·3	42·1	−2·7	56·1	−0·7	28·0	73·8	14th	37·3	4 days	36·5
South India	Wellington	6,200	24·332	+·055	?	24·404	24th	24·296	16th	·108	57·0	65·9	+0·6	50·3	+0·8	58·1	+0·7	15·6	69·7	4 days.	40·2	17th	29·5
	Kodaikanal	?	?	?	?	?	?	?	...	?	55·5	62·0	?	50·6	?	56·3	?	11·4	67·5	6th	45·8	29th	21·7
III.—Extra India		...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Persia	Bushire	14·0	30·166	?	30·138	30·034	29th	30·003	24th	·331	60·8	69·7	?	57·5	?	63·6	?	12·2	78·6	12th	43·8	30th	34·8
	Aden	94·1	30·012	?	30·039	30·068	21st	29·959	18th	·109	76·7	82·8	?	74·2	?	78·5	?	8·6	85·5	9th	70·3	24th	15·2
Arabia	Baghdad	?	29·715	?	?	29·876	2nd	29·655	14th & 26th.	·221	51·5	63·0	?	45·5	?	54·3	?	17·5	65·5	12th	41·0	25th	24·5
	Perim	?	29·882	?	?	29·965	21st	29·820	3rd	·145	77·9	84·8	?	75·7	?	80·3	?	9·1	89·5	2nd	73·6	29th	15·9
Africa	Zanzibar	73	29·946	?	29·946	29·987	25th	29·895	17th	·092	80·5	84·0	?	78·1	?	81·1	?	5·9	87·4	24th	71·9	5th	15·5

* Mean of first 22 days.
† ,, ,, 8 ,,

I—*concluded.*

in India, Burma, etc., in December 1891—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 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 October 1891.	Normal rainfall for period from 1st October to 31st October.	Variation from normal of period.	Station.	Meteorological Province or District.
...	20	4	...	...	...	...	3	4	3	2	...50	55	·507	3·4	1	...	...	0·30	3·28	−2·98	1·91	22·03	−20·12	Vizagapatam.	Madras (East Coast, North)—*concld.*
29	1	...	...	...	...	...	...	1	12	?	?	75	·481	0·7	0	...	...	0·04	1·46	−1·42	4·27	16·91	−12·64	Gopalpur.	
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	**XII.—Hill Stations.**	
31**	...	...	...	...	...	...	...	...	0	3	−100	61	·124	1·6	1	...	...	0·21	0·41	−0·20	0·51	0·48	+003	Quetta.	Beluchistan.
3	...	1	5	5	6	3	...	...	124	?	?	**78	**·160	**2·4	1	...	...	0·22	?	?	...	?	?	Shebo.	
8	1	1	2	10	6	1	1	1	2	?	?	87	·147	2·7	0	...	...	0·04	?	?	1·48	?	?	Srinagar.	Northern India.
11	6	...	1	8	...	...	...	5	6	6	0	33	·106	3·3	0	...	...	0·06	0·66	−0·60	10 52	2·61	+7·91	Murree.	
8	11	2	...	1	7	1	...	1	?	2	?	33	·099	3·6	0	...	...	0	0·70	−0·70	5·78	2·18	+3·60	Simla.	
...	10	4	8	2	...	1	1	5	?	?	?	72‡	·215‡	1·7	0	...	...	0	?	?	2·60	?	?	Mussooree.	
28	...	...	1	1	...	1	...	...	1	1	0	67	·217	1·8	0	...	...	0	0·66	−0·66	1·35	2·16	−0·81	Ranikhet.	
1	1	6	9	4	1	3	3	3	3	2	+50	74	·198	1·9	0	...	...	0	0·28	−0·28	0·89	5·74	−4·85	Darjeeling.	
...	2	2	2	4	...	3	4	5	?	?	?	76	·298	1·3	0	...	...	0	?	?	...	?	?	Kalimpong.	
7	...	2	1	...	...	...	...	1	3	4	−25	36	·196	1·1	0	...	...	0	0·13	−0·13	0·02	1·07	−1·05	Mount Abu.	Central India.
8	2	10	8	...	1	1	...	1	2	3	−33	37	·202	0·6	0	...	...	0	0·72	−0·72	1·19	4·17	−2·98	Pachmarhi.	
20	1	4	2	3	1	...	—	...	3	2	+50	81	·383	4·9	7	...	...	3·92	4·85	−0·93	47·64	25·75	+21·89	Wellington.	South India.
...	4	7	...	3	...	...	1	16	?	?	?	?	?	5·5	10	...	...	4·70	?	?	?	?	?	Kodaikanal.	
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	**XIII.—Extra India.**	
...	5	8	6	11	...	...	...	1	6	7	−14	77	·416	0	2	...	...	0·49	3·60	−3·11	4·86	5·13	−0·27	Bushire.	Persia.
11	...	6	13	1	...	...	...	...	13	12	+8	70	·618	4·6	0	...	...	0	0·24	−0·24	0·25	0·35	−0·10	Aden.	
...	12	7	5	4	1	...	1	1	149	?	?	68	·259	2·2	9	...	...	3·55	?	?	...	?	?	Baghdad.	Arabia.
...	...	4	9	16	1	1	...	...	473	?	?	75	716	3·3	0	...	...	0·06	?	?	...	?	?	Perim.	
...	11	14	2	1	...	2	...	1	?	6	?	84	·868	7·4	12	...	...	6·95	?	?	?	?	?	Zanzibar.	Africa.

** 8 Observations wanting. *a* Mean of 28 days. ‡ Mean of 30 days.

Table

Abstract of Observations recorded at 10 A.M. and 4 P.M. at 91 stations

Station.	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 to 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.
Murree	23·988	23·963	·025	23·964	+·055	+30 ?	57·3	41·9	15·4	68·9	34·3	34·6	51·4	51·6	47·9	+ 3·2	33·6	39·9	41·9	38·5
Chamba	27·120	27·024	·096	27·075	+·026	?	68·7	41·4	27·3	73·0	36·2	36·8	51·4	59·6	50·7	0	37·7	43·7	49·0	43·5
Kailang	20·889	20·817	·072	20·855	+·030	?	47·0	22·3	24·7	58·2	12·3	45·9	34·9	41·7	31·3	+ 6·6	20·3	26·1	30·6	25·7
Simla	23·188	23·129	·058	23·147	+·046	?	52·2	42·8	9·4	60·6	35·1	25·5	48·8	50·1	47·6	+ 1·8	32·4	37·8	40·3	36·8
Peshawar	29·062	28·960	·102	29·000	+·036	·162	70·3	40·3	30·1	75·6	34·0	41·6	55·8	67·8	53·4	+ 2·8	37·4	48·7	54·2	46·8
Lahore	29·440	29·358	·082	29·387	+·035	·107	72·8	40·5	32·3	77·1	34·4	42·7	61·8	69·5	54·5	+ 1·6	39·3	51·9	55·3	48·8
Ludhiana	29·311	29·218	·093	29·253	+·031	·084	72·8	41·9	30·9	76·7	35·8	40·9	61·4	69·1	55·2	+ 0·7	42·1	52·2	53·9	49·8
Mooltan	29·750	29·643	·107	29·685	+·039	·097	75·8	45·1	30·7	80·3	38·2	42·1	61·0	74·3	56·8	+ 2·7	42·0	52·4	61·0	51·8
Jacobabad	30·005	29·883	·122	29·932	+ 045	·089	78·5	43·1	35·4	84·7	38·2	46·5	66·7	76·1	58·9	+ 1·0	39·9	53·2	57·4	50·1
Hyderabad	30·020	29·939	·081	29·975	+·008	·050	80·1	52·9	27·2	88·2	47·3	40·9	73·2	78·1	65·6	+ 1·6	47·0	53·2	56·6	52·3
Kurrachee	30·113	29·999	·115	30·051	+·024	·054	82·5	56·8	25·6	88·6	53·0	35·6	73·9	80·0	68·6	+ 1·5	48·4	61·2	66·2	58·6
Jeypore	28·718	28·612	·106	28·654	+·048	·108	79·7	48·0	31·7	85·1	42·2	42·9	70·4	76·7	61·8	+ 1·9	42·3	55·1	57·9	51·8
Ajmere	28·532	28·426	·106	28·473	+·037	·110	79·3	45·9	33·4	85·0	41·4	43·6	67·9	77·5	61·6	+ 2·6	44·8	57·6	64·1	55·5
Mount Abu	26·242	26·162	·080	26·194	+·049	?	70·2	54·3	16·0	74·5	51·2	23·3	67·1	67·4	61·5	+ 2·6	45·1	50·8	50·7	48·8
Chakrata	23·410	23·346	·065	23·366	+ ·060	?	?	40·5	?	?	33·5	?	51·8	50·7	?	?	35·1	42·6	42·1	39·9
Ranikhet	24·239	24·168	·071	24·189	+ ·047	?	58·9	43·4	15·5	66·1	38·0	28·1	53·3	55·4	50·0	+ 0·5	38·9	46·2	48·2	44·4
Pithoragarh	24·898	24·824	·074	24·846	+ ·061	?	64·9	43·5	21·4	68·9	38·6	30·3	55·4	62·4	53·3	+ 0·8	40·1	49·7	50·8	46·9
Dehra	27·874	27·784	·090	27·819	+ ·056	·108	71·8	45·8	26·1	74·8	41·1	33·7	61·0	65·5	56·3	0	44·1	52·8	54·8	50·6
Roorkee	29·266	29·169	·097	29·205	+ ·068	·113	73·6	43·4	30·2	77·8	36·9	40·9	59·7	70·2	56·7	+ 0·1	41·9	53·6	57·3	51·0
Meerut	29·418	29·318	·100	29·359	+ ·060	·107	73·1	43·9	29·2	77·2	38·0	39·2	60·7	69·8	57·1	− 0·1	43·3	52·8	56·8	50·9
Agra	29·626	29·513	·113	29·558	+ ·056	·103	75·7	46·2	29·5	81·7	39·7	42·0	65·3	74·7	60·6	− 0·3	45·1	55·1	59·9	53·4
Lucknow	29·793	29·679	·114	29·725	+ ·037	·074	76·2	45·5	30·7	81·2	37·9	43·3	66·4	72·7	59·6	0	46·3	57·4	59·1	54·3
Allahabad	29·862	29·736	·126	29·787	+ ·038	·068	76·1	47·5	28·6	81·2	40·1	41·1	66·7	74·3	60·3	− 0·4	46·0	57·8	59·9	54·6
Ghazipur	29·972	29·848	·120	29·901	+ ·066	·086	77·6	51·1	26·5	82·2	43·6	38·6	68·4	73·1	62·8	+ 2·4	49·4	59·6	59·9	56·3
Nowgong	29·393	29·280	·112	29·327	+ ·043	·083	74·1	43·6	30·5	80·0	36·5	43·5	62·6	72·4	58·0	− 1·8	42·8	54·3	57·9	51·7
Sutna	29·094	28·976	·118	29·025	+ ·038	·078	74·2	43·3	30·9	79·0	37·1	41·9	66·2	73·3	57·5	− 2·0	44·5	55·3	56·8	52·2
Darbhanga	30·012	29·878	·134	29·940	+ ·055	·067	77·1	52·7	24·4	83·1	47·7	35·4	68·8	75·1	64·3	+ 0·5	53·4	61·5	63·0	59·3
Patna	29·981	29·858	·122	29·914	+ ·033	·057	74·5	52·0	22·5	80·4	45·4	35·0	67·6	73·2	62·8	+ 0·4	52·4	59·2	61·5	57·7
Hazaribagh	28·090	27·996	·094	28·032	+ ·035	·062	73·3	50·5	23·0	76·8	45·8	31·0	66·3	71·0	60·9	+ 0·5	47·0	55·2	56·2	52·8
Darjeeling	23·091	23·015	·076	23·050	+ ·045	?	50·5	37·4	13·1	57·4	33·3	24·1	47·5	47·4	43·2	+ 1·3	36·1	42·2	43·6	40·6
Pedong	25·456	25·347	·109	25·400	+ ·039	?	59·8	45·9	13·9	63·3	43·0	20·3	55·5	56·6	52·1	+ 1·5	43·4	50·2	50·6	48·0
Berhampore	30·076	29·954	·121	30·005	+ ·034	·023	78·0	57·3	20·7	80·6	53·2	27·4	69·7	75·9	67·1	+ 1·2	54·7	62·1	64·0	60·2
Burdwan	30·059	29·925	·133	29·982	+ ·040	·032	79·8	56·1	23·7	82·8	49·5	33·3	70·8	77·6	67·4	+ 0·5	55·2	59·1	61·4	58·5
Calcutta (Alipore)	30·125	29·994	·131	30·050	+ ·028	·017	78·1	56·6	21·5	80·9	50·7	30·2	70·5	76·6	66·6	+ 1·5	54·3	61·5	63·1	59·6
Calcutta (Chowringhee)	30·128	?	?	?	?	?	78·9	56·8	22·1	81·9	50·9	31·0	72·1	?	67·8	?	55·1	63·0	?	?
Saugor Island	30·110	29·985	·125	30·040	+ ·023	1·010	77·4	59·0	18·4	81·7	52·8	28·9	72·2	75·9	67·4	+ 1·0	59·0	64·8	64·9	62·9
Dacca	30·103	29·981	·122	30·037	+ ·028	·007	80·2	57·3	22·9	82·9	52·3	30·6	72·0	77·6	68·8	+ 1·3	56·9	64·7	65·1	62·3
Chittagong	30·019	29·918	·101	29·965	+ ·030	·002	81·8	59·2	22·6	85·8	53·6	32·2	73·9	76·8	69·7	+ 2·3	60·9	68·5	68·5	66·0
Demagiri	?	?	?	?	?	?	81·3	61·5	19·8	84·4	53·9	30·5	71·9	81·1	71·4	+ 5·0	?	?	?	?
Tura	Not recorded.						75·9	59·8	16·1	78·2	54·7	23·5	68·6	74·1	67·4	+ 4·4	?	61·9	63·5	?
Dhubri	30·028	29·885	·144	29·950	+ ·031	·018	76·0	55·4	20·6	78·5	52·4	26·1	66·2	75·1	65·1	+ 0·5	55·4	61·1	65·2	60·6
Sibsagar	29·805	29·642	·163	29·722	− ·012?	·028	73·6	48·7	24·8	76·3	44·1	32·2	63·8	71·9	59·9	+ 1·1	48·6	60·6	63·5	57·5
Silchar	30·019	29·891	·129	29·951	+ ·018	·010	83·1	55·5	27·6	86·5	47·5	39·0	71·5	80·8	68·1	+ 2·4	55·8	64·8	66·7	62·4

II.

in India, Burma, etc., in December 1891.

Vapour Tension.					Humidity.					Cloud.				Wind Direction.											Wind Steadiness.		Wind Velocity.		Station.
														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.	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.	
·114	·131	·169	·138	+ ·003	44	35	44	41	− 6	3·0	3·9	3·5	− 1·0	20	4	...	4	23	1	...	...	10	S. 64° E.	S. 58° E.	24	31	143	155	Murree.
·187	·200	·228	·205	+ ·012	71	52	45	56	+ 4	4·1	3·3	3·7	− 0·3	44	2	...	1	3	4	1	3	4	S. 59° W.	S. 58° E.	6	16	55	73	Chamba.
·096	·073	·083	·084	− ·013	79	36	32	49	− 17	4·6	5·2	4·9	− 0·2	...	3	...	2	11	14	11	16	5	S. 37° W.	S. 44° W.	47	46	19	20	Kailang.
·082	·115	·165	·122	− ·019	30	34	46	36	− 9	3·2	3·2	3·2	− 0·2	13	15	4	1	6	14	3	...	6	N. 45° E.	N. 83° W.	3	18	?	42	Simla.
·192	·258	·256	·235	+ ·008	76	58	38	57	− 3	2·4	2·7	2·6	− 0·7	37	2	6	4	3	3	2	1	4	N. 63° E.	S. 20° E.	10	9	47	59	Peshawar.
·229	·260	·253	·247	− ·028	90	46	35	57	+ 1	1·8	1·9	1·8	− 0·2	34	7	1	2	1	2	...	11	4	N. 53° W.	N. 36° W.	21	22	15	35	Lahore.
·248	·275	·247	·257	− ·015	86	49	34	56	− 5	2·5	3·1	2·8	0	32	6	...	3	2	...	...	11	5	N. 52° W.	N. 30° W.	21	24	28	24	Ludhiana.
·199	·282	·363	·280	+ ·016	59	52	42	51	− 4	1·9	1·6	1·7	− 0·1	7	1	10	...	5	...	16	...	23	N. 61° W.	N. 14° E.	31	11	32	31	Mooltan.
·207	·229	·224	·220	− ·011	73	34	25	44	− 2	1·8	2·4	2·1	+ 1·2	44	...	1	4	...	...	...	...	13	N. 25° W.	N. 15° W.	18	22	29	37	Jacobabad.
·238	·145	·178	·187	− ·089	57	18	18	31	− 15	5·6	4·8	5·2	+ 4·1	...	...	61	...	1	...	...	...	...	N. 46° E.	N. 6° W.	98	64	169	156	Hyderabad.
·233	·379	·466	·359	− ·017	49	45	45	47	− 8	1·8	1·1	1·4	− 0·3	...	...	45	5	...	...	6	6	...	N. 44° E.	N. 42° E.	61	14	225	216	Kurrachee.
·200	·247	·251	·233	− ·033	58	33	27	39	− 9	1·8	2·3	2·1	+ 0·5	6	4	4	1	6	7	12	9	13	S. 79° W.	N. 7° W.	31	29	46	79	Jeypore.
·274	·350	·433	·352?	+ ·088?	84	52	46	61?	+ 12?	1·4	1·6	1·5	+ 0·2	10	3	10	1	6	15	10	3	4	S. 3° W.	N. 84° E.	21	15	38	35	Ajmere.
·198	·187	·180	·188	− ·024	47	28	27	34	− 7	1·4	0·6	1·0	− 0·8	5	12	8	9	2	...	2	7	17	N. 9° W.	N. 48° E.	43	14	63	88	Mount Abu.
·152	·180	·183	·172	+ ·024	61	48	50	53	+ 3	1·1	2·5	1·8	− 1·2	19	...	14	...	...	...	13	16	...	N. 88° W.	S. 55° W.	24	14	55	99	Chakrata.
·193	·242	·265	·233	+ ·036	68	59	61	63	+ 7	1·8	2·4	2·1	− 0·2	37	...	...	3	...	2	18	2	...	S. 39° W.	S. 54° W.	31	22	31	35	Ranikhet.
·214	·304	·254	·258	+ ·036	75	69	45	63	+ 5	2·3	1·9	2·1	0	31	...	...	2	3	13	13	...	...	S. 12° W.	S. 36° E.	40	30	49	48	Pithoragarh.
·272	·302	·300	·291	?	87	56	47	63	?	1·3	2·8	2·0	− 0·3	11	5	1	6	6	13	7	9	2	S. 16° W.	N. 73° W.	27	16	27	40	Dehra.
·249	·337	·305	·297	+ ·015	87	65	41	64	+ 2	0·9	1·7	1·3	− 0·7	28	1	...	...	4	8	...	4	17	N. 82° W.	N. 82° W.	21	11	24	32	Roorkee.
·275	·299	·293	·289	+ ·008	95	56	40	63	+ 1	1·3	1·9	1·6	0	34	...	1	...	...	...	...	23	4	N. 82° W.	N. 52° W.	40	50	31	39	Meerut.
·268	·305	·324	·299	+ ·019	80	48	37	55	+ 3	1·3	1·5	1·4	+ 0·1	...	4	4	...	4	2	8	1	39	N. 50° W.	N. 64° W.	60	28	50	61	Agra.
·300	·357	·323	·328	+ ·027	91	55	41	62	+ 4	1·4	1·6	1·5	− 0·2	15	11	3	...	...	...	6	14	13	N. 54° W.	N. 53° W.	50	49	52	40	Lucknow.
·294	·366	·328	·329	− ·013	88	55	38	60	− 7	0·5	1·2	0·9	− 0·6	15	7	...	...	1	1	4	14	20	N. 61° W.	N. 54° W.	56	22	37	40	Allahabad.
·334	·400	·344	·359	+ ·003	88	57	42	62	0	0·4	0·7	0·5	− 0·7	23	...	1	3	3	3	11	16	2	S. 61° W.	S. 81° W.	35	49	24	25	Ghazipur.
·268	·315	·292	·292	− ·001	93	55	36	61	+ 3	0·6	1·5	1·1	− 0·7	5	14	1	6	1	...	...	7	28	N. 30° W.	N. 34° W.	63	29	22	27	Nowgong.
·270	·308	·260	·279	+ ·034	84	47	31	54	+ 6	0·2	0·7	0·4	− 1·0	6	28	6	2	1	...	...	3	16	N. 10° W	N. 31° W.	71	39	60	88	Sutna.
·396	·453	·417	·422	− ·005	93	64	43	68	− 6	0·1	0·3	0·2	− 0·8	1	3	2	1	2	3	17	17	16	S. 88° W.	S. 79° W.	60	58	44	50	Darbhanga.
·356	·394	·395	·382	+ ·010	80	58	49	62	− 3	0·6	1·0	0·8	− 1·0	1	2	...	...	...	...	...	55	4	N. 85° W.	N. 83° W.	93	52	61	40	Patna.
·289	·303	·273	·288	+ ·018	76	46	36	53	+ 1	1·3	1·8	1·6	− 0·4	3	23	5	1	2	5	...	6	17	N. 21° W.	N. 54° W.	56	64	108	110	Hazaribagh.
·181	·217	·246	·214	+ ·017	76	66	75	72	− 3	2·2	4·0	3·1	− 1·0	...	5	18	9	1	1	6	13	8	N. 1° W.	N. 54° W.	28	4	74	46	Darjeeling.
·256	·306	·303	287	− ·010	82	69	66	72	− 6	2·0	3·9	3·1	− 1·3	...	...	6	10	16	13	2	4	...	S. 43° E.	?	58	?	2	?	Pedong.
·397	·459	·436	·430	− ·001	84	63	49	65	− 7	1·2	2·0	1·6	− 0·3	1	30	3	2	...	...	2	10	14	N. 23° W.	N. 26° W.	71	62	39	38	Berhampore.
·386	·355	·330	·357	− ·052	77	46	35	52	− 11	1·7	2·5	2·1	+ 0·2	3	39	2	2	...	...	1	2	13	N. 10° W.	N. 23° W.	81	67	36	43	Burdwan.
·397	·430	·399	·409	− ·033	86	57	43	62	− 10	1·1	1·9	1·5	− 0·3	...	38	11	2	...	...	...	1	10	N. 2° E.	N. 26° W.	85	60	67	69	Calcutta (Alipore).
·415	·457	?	?	?	90	57	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	Calcutta (Chowringhee).
·469	·517	·473	·486	− ·015	86	67	53	68	− 6	2·8	3·1	3·0	+ 0·9	...	39	20	...	...	...	1	...	2	N. 13° E.	N. 7° E.	89	56	216	153	Saugor Island.
·428	·513	·457	·466	− ·014	83	65	49	65	− 6	2·4	2·7	2·6	+ 1·2	...	14	7	1	1	4	1	9	25	N. 34° W.	N. 36° W.	61	44	61	47	Dacca.
·510	·629	·593	·577	+ ·053	90	75	64	76	0	3·8	4·2	4·0	+ 1·9	16	9	12	3	...	...	3	7	12	N. 15° W.	N. 23° W.	40	59	33	76	Chittagong.
?	?	?	?	?	?	?	?	?	?	0·9	0·1	0·5	− 0·3	1	...	...	...	26	22	13	...	...	S. 11° E.	N. 58° W.	82	33	?	?	Demagiri.
?	·478	·466	?	?	?	68	56	?	?	2·5	2·7	2·6	− 0·6	...	1	1	23	4	11	19	2	1	S. 23° E.	S. 15° E.	43	45	?	?	Tura.
·430	·473	·492	·465	− ·003	94	73	56	75	− 2	0·7	0·7	0·7	− 0·4	4	2	34	21	...	...	1	...	...	N. 60° E.	N. 58° E.	82	42	139	109	Dhubri.
·343	·489	·474	·436	− ·013	98	83	60	81	− 2	2·2	1·6	1·9	− 2·3	...	1	44	8	6	...	3	...	...	N. 58° E.	N. 65° E.	79	61	30	38	Sibsagar.
·429	·526	·470	·475	+ ·002	92	68	44	68	− 7	4·0	3·6	3·8	+0·9	56	...	...	4	2	...	...	...	...	S. 74° E.	S. 57° E.	10	35	?	44	Silchar.

Table

Abstract of Observations recorded at 10 A.M. and 4 P.M. at 91 Stations

Station.	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 to 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.
False Point	30·120	30·008	·112	30·063	+·026	29+ 1·026	78·0	60·5	17·5	81·4	51·0	30·4	74·1	75·8	68·3	+2·0	60·6	65·7	65·0	63·8
Cuttack	30·060	29·937	·125	29·996	+·029	1·021	81·8	59·0	22·8	85·3	50·9	34·4	75·0	79·9	69·6	+0·4	58·0	62·8	64·6	61·7
Sambalpur	29·654	29·523	·131	29·586	+·041	1·015	80·7	54·6	26·1	85·1	46·5	38·6	71·6	78·5	66·6	+0·5	52·5	62·0	63·3	59·2
Raipur	29·156	29·021	·135	29·081	+·038	1·028	78·9	53·1	25·8	83·0	47·7	35·3	70·4	77·5	65·1	−0·3	48·8	58·3	60·7	55·9
Khandwa	29·067	28·958	·109	29·006	+·050	1·050	81·4	46·3	35·2	85·7	40·6	45·1	70·6	79·5	62·8	−1·8	42·8	56·0	59·3	52·7
Hoshangabad	29·128	28·997	·131	29·056	+·045	1·075	78·0	49·5	28·5	82·5	44·3	38·2	65·8	76·9	62·9	−2·4	45·8	55·6	60·2	53·8
Saugor	28·354	28·248	·106	28·295	+·052	1·067	78·2	49·1	29·1	82·3	43·5	38·8	68·3	76·5	62·6	−1·1	46·4	55·1	58·2	53·2
Jubbulpore	28·801	28·681	·120	28·734	+·054	1·083	75·8	42·5	33·3	79·3	37·0	42·3	63·8	74·6	58·3	−2·2	41·9	54·9	57·9	51·5
Pachmarhi	26·655	26·571	·084	26·606	+·043	?	70·0	42·1	28·0	73·8	37·3	36·5	64·9	55·8	55·1	−1·1	?	49·9	51·4	?
Seoni	28·069	27·957	·112	28·007	+·027	1·042	76·9	46·9	30·0	81·1	43·0	38·1	68·3	75·0	61·1	−2·2	45·8	55·5	56·8	52·8
Nagpur	29·087	28·952	·135	29·012	+·033	1·029	80·6	52·4	28·2	83·8	48·4	35·4	70·5	79·0	65·5	−1·1	46·4	56·7	59·6	54·3
Chanda	29·498	29·370	·129	29·427	+·044	1·035	81·9	49·8	32·2	85·5	43·9	41·6	70·8	80·0	64·8	−1·0	48·3	59·7	62·5	56·8
Sironcha	29·708	29·584	·124	29·639	+·010	·998	84·7	57·2	27·5	88·0	49·5	38·5	73·7	82·3	69·8	+1·0	54·5	64·1	66·4	61·7
Chikalda	26·517	26·418	·099	26·460	+·036	?	72·5	54·5	18·0	75·9	49·2	26·7	66·5	70·3	63·1	+0·3	46·8	52·4	55·0	51·4
Buldana	27·956	27·841	·115	27·891	+·028	1·013	78·7	56·9	21·8	82·9	52·4	30·5	73·5	76·9	66·7	−0·4	48·1	56·1	57·1	53·8
Akola	29·198	29·058	·140	29·121	+·045	1·040	83·2	47·3	35·9	87·0	41·0	46·0	71·5	82·1	64·3	−1·3	44·0	57·6	61·1	54·2
Makhla	?	?	?	?	?	?	75·9	54·6	21·3	77·0	47·1	29·9	67·3	74·1	64·2	+1·0	48·7	56·0	59·0	54·6
Deesa	29·646	29·537	·109	29·584	+·032	1·018	89·5	54·3	35·2	94·8	49·3	45.5	79·5	86·9	71·0	+3·1	45·6	58·0	62·5	55·3
Bombay	30·038	29·920	·118	29·972	+·025	·948	86·8	70·5	16·3	90·4	67·0	23·4	77·6	82·4	77·0	+1·1	63·4	67·0	72·0	67·5
Poona	28·243	28·106	·137	28·175	+·033	·997	85·6	51·0	34·5	90·0	46·0	44·0	76,0	84·0	68·3	+0·1	46·0	57·0	59·7	54·2
Sholapur	28·496	28·353	·144	28·423	+·034	·986	87·3	56·9	30·4	91·2	48·6	42·6	78·3	85·6	71·3	+1·1	49·8	61·2	62·6	57·9
Hyderabad (Deccan)	28·396	28·270	·128	28·334	?	·997	83·4	57·5	25·9	88·7	49·9	38·8	75.7	80·7	69·8	?	54·4	63·5	63·2	60·5
Ratnagiri	29·919	29·813	·106	29·859	+·023	·907	92·7	65·0	27·7	95·1	59·9	35·2	88·1	85·8	76·5	0	58·7	67·0	72·4	66·1
Karwar	29·973	29·855	·118	29·907	+·009	·883	90·3	62·2	24·1	93·3	60·1	33·2	79·9	87·5	77·0	+1·5	63·7	69·0	74·2	68·9
Belgaum	27·512	27·389	·123	27·447	+·014	·914	82·8	59·1	23·7	86·0	54·2	31·8	75·1	81·7	70·8	+1·6	53·7	60·8	61·4	58·5
Secunderabad	28·298	28·166	·132	28·231	+·037	·991	84·5	58·3	26·2	88·6	50·5	38·1	76·1	82·4	70·5	+1·3	54·1	64·7	65·9	61·6
Vizagapatam	30·075	29·956	·119	30·009	+·014	·978	80·4	73·2	7·3	83·0	63·0	20·0	78·9	80·1	76·7	+1·6	64·0	66·7	68·8	66·5
Bellary	28·582	28·441	·141	28·511	+·027	·946	87·4	63·2	24·2	90·4	57·4	33·0	79·2	84·9	74·3	+2·0	57·6	67·7	68·3	64·6
Madras*	29·949	29·997	·104	29·984	+·010	·937	83·4	72·5	10·9	86·5	66·2	20·3	81·2	76·6	76·8	+0·9	?	75·0	72·9	73·3
Salem	29·114	28·983	·131	29·052	+·012	·938	88·2	67·5	20·7	93·7	62·9	30·8	83·8	84·4	76·7	+1·7	66·8	72·3	72·9	70·7
Mercara	26·294	26·203	·091	26·249	+·037	·909	76·2	59·0	17·2	79·4	55·7	23·7	68·7	73·0	66·8	+1·5	56·9	61·8	62·9	60·5
Trichinopoly	29·769	29·648	·121	29·711	...·006	·903	85·2	71·5	71·5	90·0	66·9	23·1	78·7	82·0	77·4	+1·3	69·1	72·8	74·0	72·0
Cochin	29·983	29·871	·112	29·920	...·006	·858	89·5	74·1	15·4	92·3	72·1	20·2	84·4	85·9	80·3	+1·3	72·5	75·7	77·0	75·1
Wellington	24·337	24·261	·076	24·299	...·038	?	65·8	50·3	15·5	69·8	40·2	29·6	61·2	61·4	57·0	+0·9	50·4	57·2	57·5	55·0
Akyab	30·075	29·962	·113	30·017	+·027	·980	82·4	64·6	17·8	86·2	57·2	29·0	75·6	79·5	73·2	+0·7	63·9	70·1	71·3	68·4
Diamond Island	30·024	29·914	·109	29·964	+·023	·940	83·3	68·6	14·7	86·6	64·9	21·7	78·4	80·8	74·9	−2·2	65·9	71·2	73·4	70·1
Rangoon	30·029	29·912	·118	29·969	+·030	·947	91·8	69·2	22·7	97·7	63·0	34·7	78·0	82·6	77·2	+1·7	67·0	71·7	73·3	70·7
Mergui	29·926	29·810	·116	29·863	+·025	·891	87·9	63·1	24·8	91·1	54·9	36·2	83·0	84·3	74·6	−2·0	61·7	72·8	74·4	69·6
Cocos Island	29·936	29·843	·096	29·886	?	·930	82·3	?	?	85·4	?	?	80·8	78·3	?	?	71.6	75·3	73·6	73·5
Port Blair	29·940	29·836	·104	29·884	+·013	·877	83·7	76·2	7·5	89·2	73·9	15·3	82·1	82·1	79·2	−0·5	73·2	77·6	77·2	76·0
Quetta	24·834	24·753	·081	24·781	+·074	?	61·5	29·4	32·1	70·7	21·6	49·1	51·6	56·9	44·3	+1·8	28·3	39·3	42·1	36·6
Leh	19·847	19·755	·092	19·797	...·095	?	40·4	15·9	24·5	55·5	7·3	48·2	29·6	36·5	27·4	+3·1	14·3	23·6	29·8	22·6
Srinagar	25·102	25·000	·103	25·051	?	?	53·0	27·6	25·4	61·3	22·6	38·7	37·7	51·0	39·8	?	26·9	35·0	43·2	35·0
Katmandu	25·805	25·691	·113	25·746	+·041	?	74·8	35·6	39·3	79·2	29·3	49·9	54·1	67·5	53·3	+0·9	34·2	47·6	55·8	45·9
Minicoy	30·001	29·901	·100	29·947	?	·882	87·0	79·0	8·1	89·6	74·9	14·7	82·9	83·1	81·4	?	74·3	77·3	77·2	76·3
Aden	30·011	29·892	·119	29·952	−·003	·979	83·0	74·4	8·6	85·5	70·5	15·0	79·3	80·8	78·2	+1·7	68·5	71·1	70·7	70·1
Perim	29·896	29·783	·113	29·840	?	?	84·6	75·8	8·8	89·5	73·4	16·1	80·6	81·4	79·4	?	52·0	73·2	73·2	66·3
Zanzibar	29·851	29·835	·116	29·894	?	·894	84·4	77·9	6·5	87·7	71·9	15·8	81·3	83·9	81·1	?	75·1	76·8	76·7	76·0

* The hours of observations are 14 hours and 20 hours (in case of winds from the hourly means of anemograph

II—*concluded.*

in India, Burma, etc., in December 1891—concluded.

Vapour tension.					Humidity.					Cloud.				Wind Direction.											Wind Steadiness.		Wind Velocity.		Station.
														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.	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.	
·521	·535	·479	·512	+·022	93	62	54	70	− 4	2·5	2·4	2·4	−0·2	...	27	22	6	...	1	...	1	5	N. 21° E.	N. 43° E.	79	64	196	151	False Point.
·453	·415	·412	·425	−·028	84	47	40	57	− 9	2·2	2·6	2·4	+0·7	3	11	37	3	...	...	...	2	5	N. 29° E	N. 12° E.	78	35	37	30	Cuttack.
·375	·433	·384	·397	−·025	87	55	39	60	− 5	1·5	1·5	1·5	−0·4	...	26	15	...	2	1	6	3	9	N. 2° W.	N. 13° W.	58	48	93	34	Sambalpur.
·293	·329	·311	·311	−·027	71	43	33	49	− 5	1·7	2·1	1·9	+0·2	12	13	28	5	1	...	...	1	2	N. 33° E.	N. 35° E.	64	48	76	65	Raipur.
·235	·271	·257	·254	−·060	74	36	25	45	− 5	0·9	1·0	0·9	−0·9	2	5	46	4	...	1	...	1	3	N. 42° E.	N. 66° E.	84	41	69	57	Khandwa.
·251	·319	·314	·294	−·035	67	50	34	50	− 5	0·6	1·0	0·8	−0·7	2	3	33	20	1	2	...	1	...	N. 61° W.	N. 61° E.	79	63	118	57	Hoshangabad.
·265	·274	·260	·265	0	71	39	28	46	+ 1	0·4	0·9	0·7	−0·5	1	13	21	8	10	3	4	1	1	N. 58° E.	N. 37° E.	48	38	30	60	Saugor.
·261	·323	·278	·288	−·012	95	54	32	60	+ 3	0·7	1·1	0·9	−1·0	16	18	16	...	2	2	...	3	5	N. 12° E.	N. 32° E.	48	17	20	42	Jubbulpore.
?	-190	·216	?	?	?	31	34	?	?	0·6	1·3	0·9	−1·2	1	11	7	20	...	...	2	4	17	N. 16° E.	N. 29° E.	44	22	55	63	Pachmarhi.
·254	·287	·236	·258	−·043	69	41	27	45	− 7	0·8	1·2	1·0	−2·6	...	5	21	14	3	1	1	2	2	N. 57° E.	N. 44° E.	65	38	17	59	Seoni.
·245	·294	·274	·271	−·064	61	39	27	43	− 8	0·8	1·0	0·9	−1·4	5	16	36	3	...	1	...	...	...	N. 35° E.	N. 64° E.	81	52	89	68	Nagpur.
·324	·365	·337	·343	−·050	89	49	33	57	− 4	0·9	1·4	1·1	−1·4	28	13	11	5	...	...	...	...	5	N. 21° E.	N. 63° E.	42	37	34	39	Chanda.
·394	·473	·436	·435	−·016	83	57	40	60	− 4	1·0	1·8	1·4	−0·5	39	11	3	...	...	...	...	1	8	N. 13° W.	N. 1° W.	31	47	31	49	Sironcha.
·235	·233	·258	·242	−·060	55	36	35	42	−10	1·6	2·1	1·9	−0·1	37	8	...	...	3	3	3	1	7	N. 46° W.	N. 88° W.	13	9	96	117	Chikalda.
·231	·239	·225	·232	−·099	49	29	24	34	−14	1·2	1·5	1·3	−1·4	1	7	19	22	11	1	...	...	1	N. 74° E.	N. 82° E.	71	52	112	121	Buldana.
·249	·293	·263	·268	−·053	76	38	24	46	− 5	0·3	0·7	0·5	−1·0	4	3	19	27	7	1	...	...	1	N. 76° E.	N. 61° E.	74	58	86	76	Akola.
?	?	?	?	?	?	?	?	?	?	1·7	2·4	2·1	−0·8	...	6	3	4	3	18	2	13	13	S. 74° W.	S. 71° W.	26	32	?	?	Makhla.
·194	·198	·241	·212	−·046	44	20	19	28	− 8	2·0	1·6	1·8	+0·2	...	10	9	17	10	1	1	3	3	N. 69° E.	N. 17° E.	46	27	185	195	Deesa.
·488	·522	·649	·553	−·066	65	55	59	60	−10	0·8	1·1	1·0	−0·8	...	3	14	17	...	...	...	5	23	N. 11° E.	N. 17° E.	48	63	264	239	Bombay.
·252	·232	·212	·232	−·093	67	25	18	37	− 5	1·0	1·5	1·2	−1·4	8	...	7	29	8	...	...	...	...	S. 88° E.	S. 78° E.	76	56	142	138	Poona.
·275	·332	·284	·297	−·072	58	34	23	38	−10	1·9	2·3	2·1	−0·8	...	1	10	38	11	1	...	...	1	E.	N. 89° E.	84	57	195	167	Sholapur.
·368	·442	·364	·394	?	71	50	35	52	?	1·2	1·5	1·3	?	8	3	10	13	23	3	...	...	1	S. 77° E.	...	61	?	103	?	Hyderabad (Deccan).
·415	·383	·621	·473	−·082	68	29	51	49	− 9	0·3	0·3	0·3	−0·6	5	4	...	23	4	4	...	...	22	N. 39° E.	N. 4° W.	26	36	247	219	Ratnagiri.
·547	·564	·669	·593	−·013	82	55	52	63	− 6	0·4	0·7	0·6	−1·0	9	2	29	...	...	...	...	6	16	N. 5° E.	N. 1° E.	55	57	67	?	Karwar.
·352	·361	·295	·333	−·040	69	41	27	46	− 3	1·6	1·2	1·4	−1·4	2	1	16	31	11	...	...	...	...	N. 85° E.	S. 84° E.	83	70	309	296	Belgaum.
·372	·475	·435	·427	+·029	75	53	39	56	− 2	3·1	2·9	3·0	..0·7	2	3	25	31	1	...	...	...	...	N. 68° E.	N. 65° E.	85	76	99	82	Secunderabad.
·472	·506	·563	·514	−·031	58	51	54	54	− 9	3·3	2·4	2·9	+0·5	...	24	26	7	1	3	...	...	1	N. 33° E.	N. 83° E.	76	55	77	49	Vizagapatam.
·411	·547	-487	·482	+·026	70	54	41	55	− 2	4·8	3·8	4·8	...0·8	19	...	1	36	6	...	...	...	...	S. 85° E.	S. 87° E.	66	69	99	75	Bellary.
?	·789	-761	·775	+·088	?	74	83	84	+ 6	6·5	4·4	5·9	...0·6	...	30	30	2	...	...	...	...	...	N. 24° E.	N. 24° E.	90	75	228	182	Madras.*
·634	·684	-657	·658	+035	89	66	57	71	... 4	5·0	6·5	58	...1·7	1	6	28	24	...	...	2	...	1	N. 59° E.	N. 89° E.	79	48	77	93	Salem.
·429	·475	-457	·454	—·011	81	68	57	69	− 7	5·5	5·8	5·7	...0·7	...	...	13	44	...	...	...	...	...	N. 57° E.	N. 73° E.	93	75	205	120	Mercara.
·683	·726	-739	·714	+·053	88	74	70	77	... 3	6·3	6·8	6·6	...o·6	2	5	46	2	...	...	...	...	7	N. 35° E.	N. 39° E.	84	75	150	121	Trichinopoly.
·773	·772	-808	·784	+·052	90	65	65	73	-- 1	2·4	3·8	3·1	—0·2	4	...	21	4	1	...	1	19	12	N. 21° E.	S. 50° W.	37	15	78	?	Cochin.
·358	·425	-434	·406	+·057	91	79	80	83	... 6	5·8	6·3	6·1	...0·5	1	3	6	13	32	7	...	...	...	S. 61° E.	S. 35° E.	74	60	61	56	Wellington.
·568	·666	·663	·632	+·042	87	75	66	76	0	2·4	2·9	2·7	+0·2	...	9	27	1	1	1	1	3	19	N. 5° E.	N. 15° W.	63	39	54	56	Akyab.
·603	·669	·727	·666	−·037	86	69	69	74	− 1	4·6	5·2	4·9	+1·6	...	21	31	9	1	...	...	...	...	N. 37° E.	N. 34° E.	85	74	278	173	Diamond Island.
·637	·697	·700	·678	+·002	89	74	63	75	+ 2	3·5	4·4	4·0	+0·8	...	13	35	12	2	...	...	...	...	N. 46° E.	N. 36° E.	85	61	111	117	Rangoon.
·535	·677	·719	·643	−·054	92	60	61	71	− 3	3·9	4·8	4·4	+1·2	...	18	18	15	4	...	...	...	7	N. 38° E.	N. 27° E.	66	65	58	41	Mergui.
?	-806	-769	?	?	?	77	79	?	?	4·5	4·7	4·7	?	...	1	49	6	3	...	...	...	...	N. 52° E.	?	92	?	419	?	Cocos Island.
·771	·887	·872	·843	+·006	84	81	80	82	+ 2	6·7	6·7	6·7	+2·2	...	7	15	10	15	10	...	...	1	S. 85° E.	N. 51° E.	53	72	321	173	Port Blair.
·133	·118	·119	·122	−·020	77	32	27	45	− 9	1·8	2·7	2·2	−0·6	61	...	...	...	...	...	...	...	1	N. 45° W.	N. 48° W.	45	37	?	61	Quetta.
·074	-081	-114	-090	+·012	80	49	54	61	... 2	4·6	5·3	5·0	—0·4	31	...	...	1	2	2	18	8	...	S. 49° W.	S. 1° W.	40	34	5	31	Leh.
·139	·171	·190	·167	?	92	77	51	73	?	2·5	2·7	2·6	?	...	14	9	2	8	8	1	4	15	N. 5° W.	?	27	?	62	?	Srinagar.
·191	·251	·313	·259	−·014	89	60	48	67	− 6	1·3	2·3	1·7	—1·1	12	8	...	2	...	...	...	40	...	N. 78° W.	N. 69° W.	63	69	57	?	Katmandu.
·786	·864	·858	·836	?	80	77	76	77	?	4·5	5·6	5·1	?	2	11	16	6	10	3	4	2	8	N. 49° E.	?	29	?	152	?	Minicoy.
·619	·655	·619	·631	—·004	73	66	59	66	− 4	3·5	1·3	2·4	−1·9	7	...	12	23	11	4	1	2	...	S. 84° E.	N. 89° E.	60	69	321	299	Aden.
·073	-720	-714	-503	?	81	69	66	47	?	2·0	0	1·0	?	...	...	2	13	39	5	3	...	...	S. 50° E.	?	84	?	499	?	Perim.
·883	·861	·824	·839	?	87	81	71	80	?	6·8	4·2	5·5	?	...	18	21	10	3	4	2	2	2	N. 40° E.	N. 26° E.	56	30	?	142	Zanzibar.

at 12 hours and 24 hours) and the means are as given in the registers sent by Government Astronomer, Madras.

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.

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

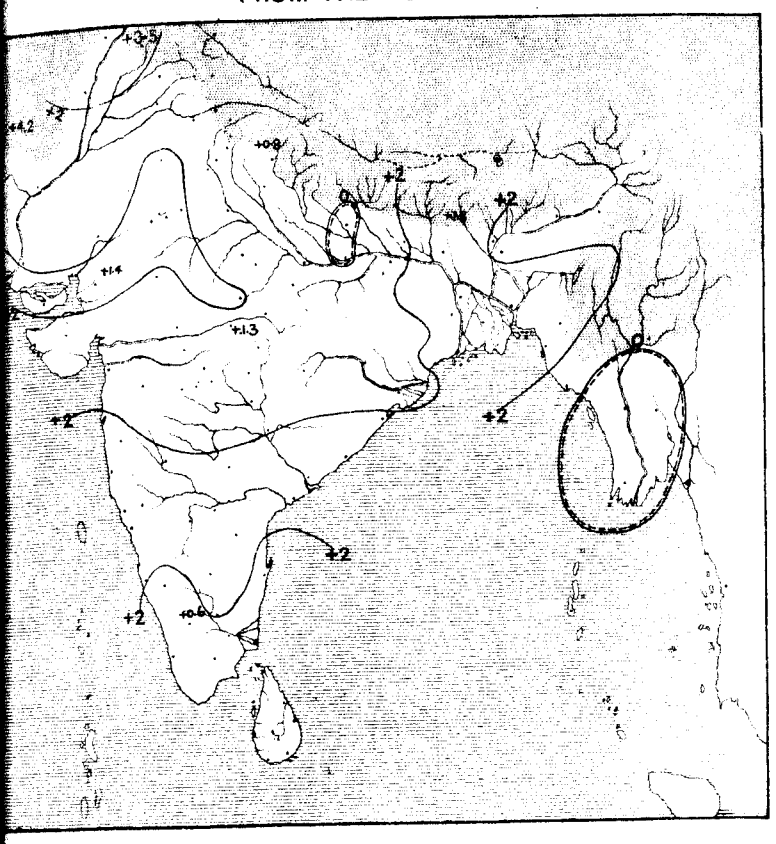
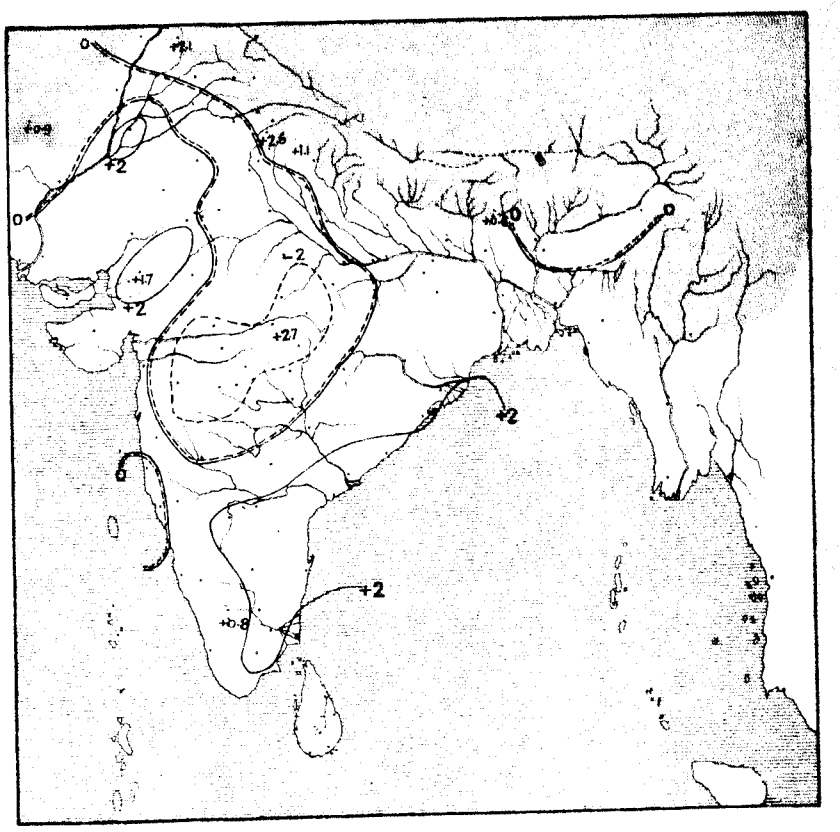


CHART SHEWING THE VARIATION OF THE MEAN MINIMUM TEMPERATURE OF THE MONTH FROM THE NORMAL.



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.

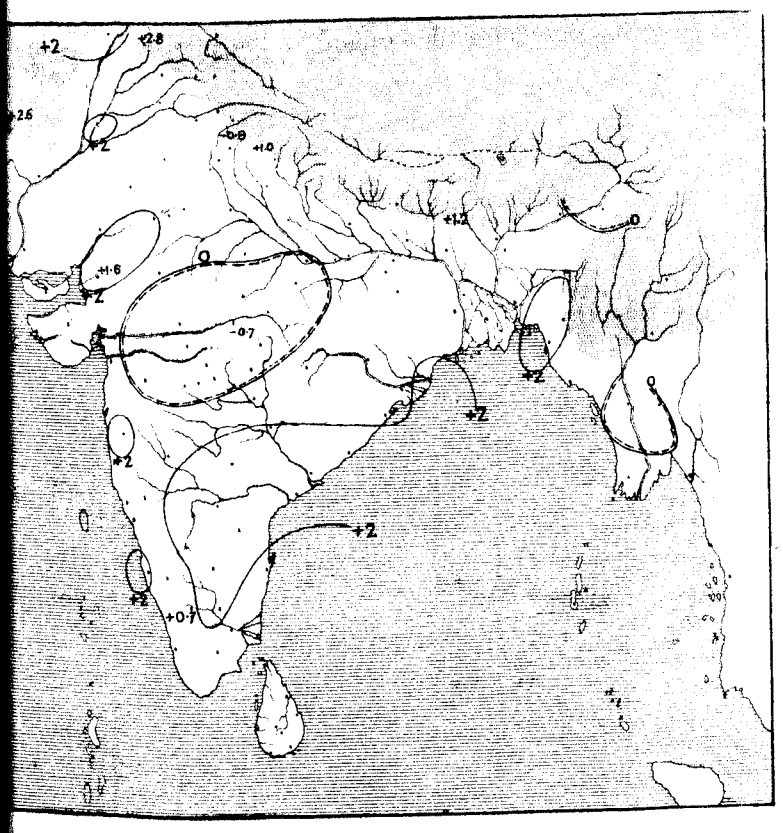
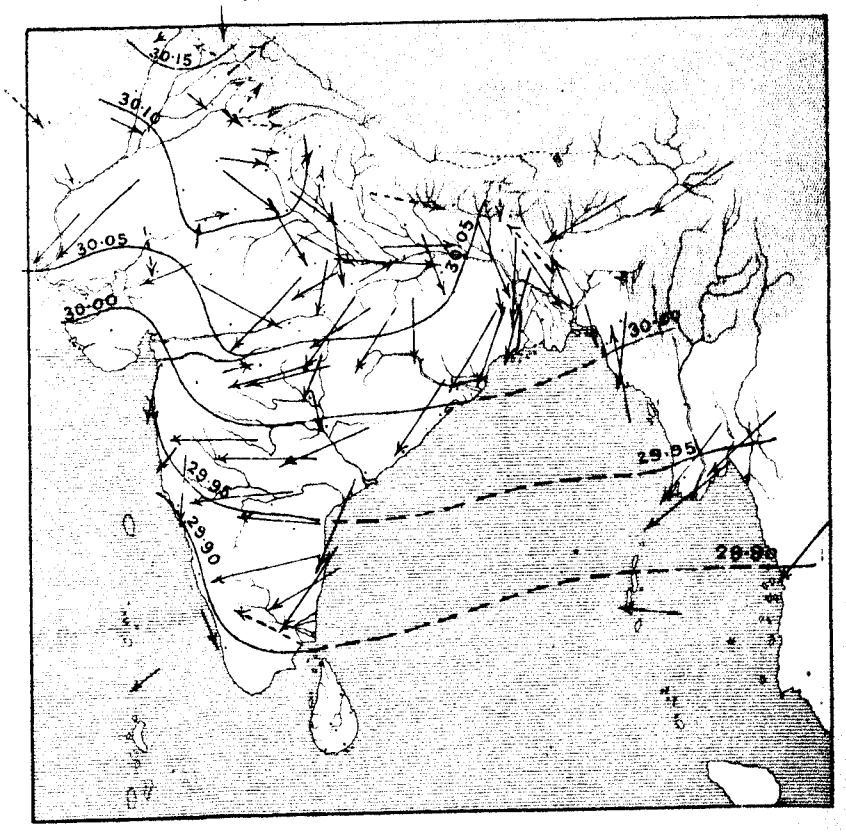


CHART SHEWING THE MEAN DISTRIBUTION OF PRESSURE AND THE RESULTANT WIND DIRECTIONS IN THE MONTH OF DECEMBER 1891.



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. 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 51 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 name of the districts 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
3. Central do.
4. Upper do.
5. Arakan
6. Eastern Bengal
7. Assam (Surma)
8. Do. (Brahmaputra)
9. Deltaic Bengal
10. Central do.
11. North do.
12. Orissa
13. Chota Nagpore
14. Behar (South)
15. Do. (North)
16. North Western Provinces (East)
17. Oudh (South)
18. Do. (North)
19. North Western Provinces (Central)
20. Do. do. (West)
21. Do. do. (Submontane)
22. Punjab (South)
23. Do. (Central)
24. Do. (Submontane)
25. Do. (Hill Districts)
26. Do. (North West)
27. Punjab (West)
28. Malabar
29. Madras (South Central)
30. Coorg
31. Mysore
32. Konkan
33. Bombay Deccan
34. Hyderabad (North)
35. Khandeish
36. Berar
37. Central Provinces (West)
38. Do. (Central)
39. Do. (East)
40. Guzerat
41. Kattiawar
42. Sind
43. Central India (East)
44. Rajputana (East) Central India (West)
45. Rajputana (West))
46. East Coast (North)
46(a.) Do. do. (a)
47. Hyderabad (South)
48. Madras (Central)
49. East Coast (Central)
50. East Coast (South)
51. Madras (South)