ARTICLE No. 12.

Meteorological Normals of Calcutta.

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CONTENTS.

HISTORICAL INTRODUCTION.

Seasonal weather with its variations has always been an important factor in India. From the earliest times of British interest in this country more or less desultory observations were taken at the instance of various officers scattered in different parts of the country. Observations before 1865 have mostly been found to be of little value.

In Calcutta, at the Survey Office in Park Street, systematic observations commenced in 1853. Interest in the meteorology of India in general, and of Bengal in particular, received an impetus after the great cyclone that visited Calcutta in October 1864. It was accompanied by a storm wave up the Hughly.

Over 80,000 human beings were drowned or died of exposure and a great part of the shipping on the river was wrecked. As a result of the awakening of interest in weather phenomena, five provincial systems of observations were evolved during the period 1865–1874. The one for Bengal came into being in 1867, under the Reportership of Mr. H. F. Blanford, who was then Professor of Science in the Presidency College and one of the honorary secretaries of the Asiatic Society of Bengal.

About 1874, on the recommendation of the English Meteorological Council a reorganisation of the observational

Fig. 1. Alipore Observatory.

work in India was contemplated by Government, and Mr. Blanford was appointed the Imperial Reporter. He drew up a scheme for an all-India service, which was launched in 1875. The Alipore Observatory was started as one of the initial items of this scheme. The objects of the observatory were manifold. Some of them were :—recording of observations of various meteorological elements, maintaining autographic instruments also for this purpose ; providing for a central depot for verification of instruments for other observatories, and for a training ground for observers. Experimental observations and special investigations were also part of the observatory's programme

of pioneer work, which commenced in 1877. After the establishment of this institution, observations at the Survey Office were stopped. The normals given in the tables at the end, are based on the records of various self-recording instruments and eye observations extended over a series of some 20 years, at the Alipore Observatory (Fig. 1). Latitude 22° 32′N. Longitude 88° 24′E.

REFERENCE TO PREVIOUSLY PUBLISHED CALCUTTA DATA.

Apart from the mass of observational data for Calcutta, published in the Asiatic Society's Journal, the Meteorological Department's reports and Father Francotte's publication of observations at St. Xavier's College, there are a few memoirs of the India Meteorological Department in which observations of some elements or other have been discussed. They are:—

INDIAN METEOROLOGICAL MEMOIRS.

Vol. I, Pt. I.—On the winds of Calcutta, by H. F. Blanford. This contains an analysis of 10 years' (August 1856–July 1866) hourly observations of the wind vane and four years' anemograms (July 1871–June 1875).

Vol. II, Pt. V.—On observations of temperature and humidity at a height of 4 feet and 40 feet above the ground at Alipore Observatory, by S. A. Hill. April 1878 to March 1882.

Vol. IV, Pt. I.—On the diurnal variation of the rainfall at Calcutta, by H. F. Blanford. Seven years' data (January 1878–December 1884) from a hyetograph have been considered.

Vol. IX, Pt. VIII.—Discussion of hourly observations of temperature, air pressure, and aqueous vapour pressure as recorded by the autographic instruments in use at the Alipore Observatory, Calcutta, during the period 1881 to 1893, by E. Douglas Archibald. Harmonic analysis has been largely used in the discussion.

Vol. XVIII, Pt. II.—A discussion of the anemographic observations recorded at Alipore from March 1877 to February 1904, by Sir John Eliot.

None of these, however, deal with the "normals" alone, and generally the periods of data used are comparatively short. The data for the tables at the end of this compilation, on the other hand, are for some 20 years; and further in cases of most elements, more or less synchronous. This is an attempt to collect together "normals" of all available elements, for purposes of reference.

BLANFORD'S DESCRIPTION OF THE CLIMATE OF CALCUTTA.

For a pen picture of the normal march of the seasons in Calcutta it is best to quote Blanford[1]:—

"At Calcutta, the cool weather scarcely sets in before the second week of November, and lasts only to the middle or latter part of February. For ten or twelve weeks the weather is delightful, pleasantly cool in the daytime, and in the evening sufficiently cold to make a fire agreeable, though perhaps hardly indispensable to comfort. But the dampness of the climate manifests itself at night in frequent fogs on the river and the low grounds around; and in the native part of the town and the crowded suburbs, the smoke from the huts condenses the moisture of the air and enshrouds the habitations in a veil of fog that remains suspended in the still atmosphere. About the end of February the days begin to be appreciably warmer, the sun's power greater and his glare more intense, and in March it is sufficiently warm in the house to require that the punkah be set in movement once more after its three months' holiday. But the nights, or at least the hours after midnight, are still comparatively cool, and as the air is as yet not highly charged with moisture, to an acclimatised European the heat is by no means oppressive. During this month and April the rise of temperature is very rapid, and by the end of the latter month the afternoon readings of the thermometer are often as high as any recorded during the year.

"In December any rain is exceptional. In January and February it occurs less regularly and frequently than in Upper India, but there are generally two or three rainy days in these months, preceded by some days of close cloudy weather with light southerly winds; and when the weather clears a great fall of temperature follows and a renewal of the cold season. In March and April rain becomes more frequent, but in the shape of the thunder squalls known as nor'-westers which, as a rule, come on towards the evening, and are often preceded by a dust-storm. Their general character has been described in a previous part of this work. For a graphic but perhaps somewhat exaggerated account of one of these little storms the reader may be referred to M. Rousselet's well-known work on India, where, however, the writer appears to be under the mistaken impression that he had experienced a cyclone. These squalls are more frequent in May, and sometimes usher in a day or two of continuous rain; but, more frequently, an hour or two expends their force and they are followed by a refreshing night and a somewhat cooler day. Now and then, at intervals of some years, a cyclone may pass

[1] Blanford—A Practical Guide to the Climates and Weather of India, Ceylon and Burmah and the Storms of Indian Seas: 1889, pp. 152–154.

over Bengal in May or the early part of June but these more formidable visitors are perhaps rather to be expected at the end than at the beginning of the monsoon, and happily, at any season, are to be reckoned as meteorological rarities in Bengal.

"An advantage which Calcutta enjoys in the hot season, and which is denied to places much further inland, is the southerly breeze which, at the close of a hot day, often blows up from the wide estuary of the Hughly, bringing some hours of agreeable relief. It does not last beyond midnight, but it mitigates the heat of the dinner hour, and renders the southern verandahs of the large Chowringhee houses pleasant places for the post-prandial lounge.

"At length, in the early part of June, the clouds gather, more thickly, while the barometer falls to a lower point than it has reached since the beginning of the year; and in the first or second week, heavy and continuous rain ushers in the monsoon. This first burst of the rains usually accompanies a cyclonic storm formed either at the head of the bay or over the delta itself. As has been explained in a previous part of this work, such storms are not attended with very strong winds, at least on land, though the weather may be stormy at sea; and the barometric depression at their centre does not exceed two or three-tenths of an inch. The first onset generally carries the rains to the greater part of Bengal, and sometimes, but not always, to Behar. As a rule, the rainfall does not penetrate to the Upper Provinces till some days or even weeks later. Its immediate effect is a great fall of the day temperature; and the comparative coolness, supervening on many weeks of close oppressive weather, brings a sense of relief. Bursts of rain of a similar character alternating with sporadic showers and an occasional rainless interval rarely lasting more than a day or two, follows in succession through July and August. The air is saturated with vapour; vegetation grows apace, and indoors and out of doors every absorbent material reeks with moisture; but so long as the rainfall is abundant, and the intervals of its suspension short, the climate, if not exactly pleasant, is not very oppressive nor notably unhealthy. When, however, in September, the rainless intervals become longer, and the day temperature begins to rise, while the air, still highly charged with moisture, is almost motionless, the relaxed energy of the human system fairly rebels against this further trial of its endurance, and all who are not compelled by their avocations to remain at their post hasten to escape to the temporary refuge of a hill station. September and October are thus the most trying and unhealthy season of the year; and in Bengal it is not until the end of October or the early part of November that an appreciable fall of temperature brings relief.

"Such, according to the author's experience of many years, is the climate of Calcutta, and the description may serve as

fairly representative of that of the greater part of Bengal. Farther north indeed, and on the higher ground to the west of the delta, the hot season is somewhat drier and its temperature rather higher; and in Eastern Bengal the differences are of the opposite character."

Notes on Tables of Normals.

In the case of observations like pressure, temperature and wind direction, the hour mentioned is the instant of observation; while in the case of elements like rainfall, wind movement, sunshine, the hour indicated represents the 60 minutes ending with that hour; *e.g.*, period 10 hrs. to 11 hrs. is given as 11 under "hour". Local mean time is always implied; pressures are in inches of mercury, temperatures in Fahrenheit degrees; surface wind velocity in miles per hour, and upper air winds in metres per second.

Air Pressure. Table I gives the hourly normals of air pressure. Also see Fig. 2. These are based on tabulations of the records, for the period 1898–1917, of the Kew Barograph. A light from a lamp passing through a condenser and a slit cuts across the top of the mercury column of a barometer and is focussed on a drum carrying photographic paper. The drum rotates once in two days and when the paper is developed the line of demarcation between the light and dark areas of the photograms represents the variation of the barometric height. The values given (in inches of mercury) are corrected to 32° F. and have been also corrected so as to be comparable with the Alipore standard barometer, *i.e.*, corrected for "index error". The correction of the Alipore standard barometer to Kew Standard is supposed to be + .005". The values are not corrected for sea level, nor for gravity. The height of the cistern of the instrument above sea-level is 20 feet.

Temperature. Table II gives the hourly normals of surface air temperature worked out from tabulations of the records of the Kew Thermograph for the period 1901–20. Also see Fig. 3. The thermograph photographically registers the dry and wet bulb temperature. At the north end of the observatory is a louvred pent-house in which the thermometers are kept, the bulbs being about 5 ft. above ground. Their bent stems are led into the observatory through a wooden wall. Near the top of the threads of the thermometers, there are small breaks in the column. Reflected light from lamps passes through these tiny gaps near the tops of the threads into a dark box, where it is focussed on to a drum covered with sensitive paper and driven by clockwork. Continuous records of temperature are thus obtained, there being suitable

provision of an occulting device for causing small gaps in the photographic records in order to identify hours.

It is worth while comparing the exposure of thermometers of this thermograph with that obtained in the meteorological thatched shed a few yards away, where thermometers are kept from which eye observations are taken for weather report and climatological purposes. Until a few years ago all the meteorological observatories in India housed their thermometers in similar open-sided thatched sheds, which have mostly been replaced by Stevenson Screens in recent years. In the shed the thermometers are about 4½ ft. above ground. A whole year's comparison (1921) between the records of Kew Thermograph and those of the shed readings of 10 hrs. and 16 hrs. gave the following mean differences.

	Dry Bulb difference in °F.		
	10 hrs.	16 hrs.	Mean
Shed minus Kew thermograph	+ 1.7	+ 0.8	+ 1.3

Further comparisons were made in 1927-28 for 4 selected months August, November, February and May, and simultaneous ventilated Assmann Psychrometer observations were also taken in the shed and the pent-house, where the usual observations are from unventilated bulbs.

The following tables summarise the results :—

		Dry bulb difference °F.			
		8 h.	10 h.	16 h.	Mean
(*a*) Shed (unventilated) minus Kew thermograph (unventilated).	August	+ 0.1	+ 0.5	− 0.7	0.0
	November	+ 0.2	+ 3.9	+ 2.1	+ 2.1
	February	+ 0.3	+ 3.8	+ 3.0	+ 2.7
	May	− 0.2	+ 0.6	+ 0.2	+ 0.2
	Mean of 4 months	+ 0.1	+ 2.2	+ 1.1	+ 1.1

		Dry bulb difference °F.			
		8 h.	10 h.	16 h.	Mean
(*b*) Shed (ventilated, *i.e.*, Assmann) minus Shed (unventilated).	August	− 0.8	− 0.4	− 0.1	− 0.4
	November	− 1.7	+ 0.3	+ 0.3	− 0.4
	February	− 1.7	− 0.2	+ 0.7	− 0.4
	May	− 0.6	+ 0.1	+ 0.5	0.0
	Mean of 4 months	− 1.2	− 0.1	+ 0.3	− 0.3

These results roughly indicate—

(*a*) that in the non-rainy, cold and non-cloudy months the louvred pent-house situated as it is adjoining the observatory building and in the proximity of a number of trees exerts a shielding influence, the thermometers in it registering from about 2° to 4° less than those in the open shed, during the hotter portion of the day. The effect presumably is much less marked in the hot weather and the monsoon.

(*b*) that during the cooler and less breezy portion of the day and night (as represented by 8 hrs.) the unventilated readings in the shed are generally higher by a degree or more (about 2° in the winter months), than the ventilated readings. During the hotter portion of the day (with which also is associated greater breeziness) this effect for all practical purposes vanishes.

Table III contains the monthly normals of maximum temperature, minimum temperature, the wet minimum temperature and the grass minimum temperature. The first two are based on 33 years' data and have been already published in the book of normals (Indian Meteorological Memoirs, Vol. XXII, Pt. 3). The normals of wet minimum and the grass minimum were worked out from data for 1901-1920. The grass minimum thermometer which is supposed to register the minimum attained by nocturnal radiation has always been exposed on a felt pad fixed on a thin wooden block on the ground, supposed to provide an exposure of non-varying character and simulating a grass lawn in effect.

Ground Temperature. Table IV contains normals of ground temperature based on observations from 1890 to 1904. Observation times were for all these years fixed at $5\frac{3}{4}$ hrs., $13\frac{3}{4}$ hrs. and $21\frac{3}{4}$ hrs. Four thermometers used to be read. One was kept flat with the bulb touching the sur-

face of bare ground and the others were buried with bulbs at depths of 1 ft., 3 ft. and 6 ft., in the soil. One feels some doubt about the satisfactoriness or the constancy of the exposure of the surface thermometer. Probably the normals at best indicate only very broadly, the variations of the temperature of the surface of the soil, from month to month.

While dealing with temperatures, it may not be out of place to mention the Solar Radiation Thermometer (Black bulb *in vacuo*), at Calcutta. Blanford, in his book referred to on page 4, gives the following values based on observations in 1885, which show roughly the order of sun thermometer readings to be expected.

	Temperature in the sun °F.	Excess over shade maximum.
January ..	137	55
February ..	145	64
March ..	155	63
April ..	159	62
May	165	66
June	162	71
July	160	71
August ..	155	67
September ..	155	66
October ..	155	67
November ..	146	62
December ..	140	65

Humidity. Table V contains hourly normals of the wet bulb temperature. These are based on the data (1901-1920) from records of the wet bulb of the Kew thermograph described on page 242. The wet bulb is alongside the dry bulb and registration is on the same sensitive paper. The wet bulb is non-ventilated. A comparison between the Kew thermograph, shed thermometers and the Assmann Psychrometer observations, similar to that made for the dry bulb thermometers and described on page 243 gives the following results :—

A year's comparison.

(1921.)

	Wet Bulb difference in ° F.		
	10 h.	16 h.	Mean
Shed minus Kew thermograph ..	+1·1	+0·3	+0·7

(1927–1928.)

		Wet Bulb difference ° F.			
		8 h.	10 h.	16 h.	Mean
(*a*) Shed (unventilated) minus Kew thermograph. (Unventilated)	August ..	−1 0	−0·8	−1·6	−1·1
	November	−0 6	+0·8	+0·1	+0·1
	February	−0·5	+1·4	+0·8	+0·6
	May ..	+0·1	0·0	−0·2	−0·1
	Mean of 4 months.	−0·5	+0·3	−0·2	−0·1

		Wet bulb difference ° F.			
		8 h.	10 h.	16 h.	Mean.
(*b*) Shed (ventilated *i.e.*, Assmann) minus Shed (unventilated)	August ..	−0·4	−0·3	−0·3	−0·3
	November	−0·4	+0·5	+1·1	+0·4
	February	−0·4	+0·6	+1·0	+0·4
	May ..	−0·4	0·0	+0·3	0·0
	Mean of 4 months.	−0·4	+0·2	+0·5	+0·1

(*a*) The differences between shed and pent-house range from 0 to about 1°. In the hot weather they seem to be negligible and in the monsoon of the order of 1° the shed value being lower. In the cold weather apparently the shed wet bulb is lower in the cooler portion of the day and higher in the warmer.

(*b*) At 8 hrs. the difference between ventilated and unventilated wet bulb seems to be always 0·4°, the ventilated value being lower. In the hot part of the day this does not seem to hold good except probably in the monsoon.

Table VI shows the hourly values of relative humidity (percentage of saturation) and Table VII the corresponding values of vapour tension in inches of mercury at 32° F. Also see Figs. 3 and 4.

Rainfall. Table VIII contains the normals of monthly rainfall in inches according to different hours of the day, based on the records, for 1905–1924, of the Beckley's autographic tilting bucket raingauge. Also see Fig. 5. This raingauge was located in a small room, within a few yards of the enclosure containing the other raingauges of the observatory. The funnel receiving the rain was in the roof of the room, 8 ft. above the ground. Ordinary raingauges have their funnel rims just a foot above the ground.

Scattered through the period 1911–1924 there were small gaps of a few months duration when the Beckley raingauge was not working. The tabulations of the Beckley records were therefore supplemented by the records of the Hellmann's self-recording syphon raingauge. The total period of such supplements is 14 months, *i.e.*, only about 6 % of the whole period of 20 years.

In this connection it is interesting to compare the monthly normals derived from Beckley raingauge with those of the ordinary raingauge. The following table summarises this information.

MONTHLY RAINFALL.

	Beckley 20 years 1905–1924.	Ordinary 20 years 1905–1924.	Ordinary 43 years[1] ending 1920.	Number of rainy days.[2]
January ..	0·36	0·44	0·34	0·7
February ..	1·28	1·22	1·10	1·6
March ..	1·57	1·63	1·44	2·4
April	1·93	2·11	1·89	3·2
May	5·02	4·93	5·75	7·3
June	12·87	13·35	11·90	13·3
July	13·97	12·74	12·51	17·8
August ..	13·64	13·80	12·69	18·3
September ..	9·10	9·00	9·87	13·2
October ..	4·73	4·30	4·19	6·0
November ..	0·46	0·67	0·66	1·0
December ..	0·13	0·16	0·20	0·4
Year	65·06	64·35	62·54	85·2

It may not be out of place also to record here the frequency of heavy rain at Alipore.

FREQUENCY OF HEAVY RAIN.

Alipore.

Rainfall in 24 hours ending 8 hrs.	Number of occasions during 30 years 1891–1920.
3″ to 4″	32
4″ to 5″	15
5″ to 6″	9
6″ to 7″	4
7″ to 8″	2
8″ to 9″	3
9″ to 10″	..
10″ to 11″	1
11″ to 12″	1
12″ to 13″	..
13″ to 14″	..
14″ to 15″	1

Cloud. Tables IX to XI give the relative frequency of different kinds of clouds in different months for three observation times, 8 hrs., 10 hrs., and 16 hrs. Records of the period 1901–1920 were consulted in preparing these tables and the figures given represent the mean number of days in a given month on which a particular kind of cloud prevails at the specified hour. There are, of course, a number of occasions when several kinds of cloud co-exist and this results in the total

[1] Published in Indian Meteorological Memoirs, Vol. XXIII, Pt. 7.
[2] A rainy day is a day on which 0·1″ or more of rain is recorded.

of cloud-unit occasions in a month exceeding the number of days in the month.

Table XII shows the amount of cloudiness at 8, 10 and 16 hrs. in different months, on the basis of whole sky being taken as 10.

Sunshine. Table XIII indicates the average hours of bright sunshine in different months. They are based on sunshine records of a Whipple-Casella Sunshine-Recorder for the period 1889 to 1908.

Wind. The autographic records of the standard instrument, a Robinson-Beckley anemograph have been used in finding out the hourly normals of wind direction and velocity. The rotating cups of the instrument are on one of the towers of the Observatory, at a height of about 60 ft. The cups are geared on to a cylinder with a projecting metal helix which by contact pressure on "metallic" paper mounted on a rotating drum records the run of the wind. The wind direction is also recorded by means of vanes which rotate with change in wind direction and are geared on to a recorder similar to that registering the run of the wind. The records for the period 1901–1920 were used. Table XIV contains values of the normal hourly wind velocity. Also see Fig. 5. Table XV gives the hourly mean monthly direction of wind. Tables XVI to XXVII show the hourly percentage frequency of wind direction reduced to 8 points of the compass, month by month.

The records of a Robinson-Beckley instrument are not useful for the study of wind structure; but in Plate 16 are reproduced three pressure-tube anemograms of days, more or less randomly selected, but typical of different seasons. In the same plate is included an anemogram during the passage of a monsoon cyclonic storm, fairly close to Calcutta.

Upper Air Winds. Tables XXVIII to XXXI contain the normals of upper winds. The observations on which these normals are based cover the period 1915–25. Until July 1923 the pilot balloon station was at Alipore (Calcutta), but it was found that the visibility in Calcutta is not satisfactory and is usually positively bad in the winter months. The main cause of this is apparently the smoke from the city and from the mills to the north of Calcutta. The prevailing northerly winds of the winter bring this smoke from the mill area south to the vicinity of Calcutta. Most probably, there is also a persistent temperature inversion in this region, during these months, at least in the lower layers of the free air, which helps to maintain the atmospheric turbidity. The upper air station was therefore shifted to Diamond Harbour some 40 miles down the river Hughly to the south, where the flights proved more successful. The normals were computed at the Aerological Observatory of Agra.

Some abnormal Records of Calcutta.

In conclusion, although this paper deals with meteorological normals, it may be worth mentioning some of the most abnormal records of Alipore.

"Record" values.	
Maximum temperature ..	111·3° on 31st May, 1924.
Minimum temperature ..	44·4° on 20th January, 1899.
Grass Minimum temperature ..	32·3° on 7th February, 1883.
Wind velocity in gusts exceeding 60 m. p. h.	28th April, 1914 } both during 24th May, 1926 } nor'-westers. 61 to 65 m.p.h.
During 1878–1927 { Highest annual rainfall Lowest ,, ,,	89·32″ in 1900. 39·38″ ,, 1895.
Examples of extremely *intense* fall of rain.	3·50″ in 1 hour, 1·30 A.M. to 2·30 A.M. on 22nd July 1926 during a thunderstorm. Total rain in the storm 5·26″ in 3 hours, 10 minutes, out of which 4·20″ fell in 1¼ hours. 3·25″ in 40 minutes during an afternoon thunderstorm on 6th May 1928, *i.e.*, at the rate of 4·88″ an hour.
[1] Daily falls of rain exceeding 10″ during period 1891–1927 (8 A.M. to 8 A.M. records).	14·53″ on 20th September, 1900. 11·95″ ,, 18th June, 1908.
Falls exceeding 10″ in 24 hours (1912–1927).	12·75″ between 8 P.M. 5th August, 1920 and 8 P.M. 6th August. 10·49″ between 10 P.M. of 24th September, 1922 and 10 P.M. 25th.

[1] *Ind. Met. Mem.*, Vol. XXI, Pt. 3 pp. 33, 35.

The Observatory,
Alipore, Calcutta.
The 7th January, 1929.

TABLE I.

NORMALS OF PRESSURE.

(1898–1917.)

HOUR.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Year.
0	30·038	29·970	29·874	29·765	29·683	29·562	29·554	29·606	29·712	29·849	29·965	30·029	29·800
1	30·031	29·963	29·857	29·752	29·668	29·546	29·539	29·591	29·701	29·839	29·957	30·022	29·789
2	30·022	29·952	29·847	29·739	29·656	29·536	29·527	29·578	29·687	29·830	29·947	30·013	29·778
3	30·012	29·941	29·839	29·729	29·650	29·529	29·514	29·568	29·678	29·825	29·942	30·005	29·769
4	30·009	29·937	29·836	29·730	29·653	29·529	29·514	29·565	29·676	29·824	29·940	30·004	29·768
5	30·015	29·943	29·846	29·744	29·663	29·535	29·519	29·570	29·683	29·834	29·948	30·011	29·776
6	30·029	29·960	29·865	29·760	29·680	29·548	29·530	29·580	29·694	29·851	29·966	30·025	29·791
7	30·050	29·983	29·890	29·785	29·700	29·565	29·546	29·600	29·714	29·873	29·989	30·049	29·812
8	30·075	30·006	29·912	29·805	29·714	29·575	29·556	29·612	29·732	29·890	30·010	30·071	29·830
9	30·100	30·028	29·930	29·819	29·727	29·582	29·567	29·624	29·744	29·902	30·025	30·093	29·845
10	30·104	30·039	29·934	29·820	29·734	29·584	29·568	29·625	29·746	29·902	30·023	30·092	29·848
11	30·088	30·022	29·925	29·810	29·719	29·577	29·563	29·618	29·737	29·887	30·005	30·075	29·836
12	30·057	29·998	29·900	29·790	29·697	29·563	29·551	29·604	29·718	29·862	29·975	30·044	29·813
13	30·020	29·963	29·868	29·760	29.672	29·544	29·532	29·584	29·692	29·833	29·941	30·007	29·785
14	29·994	29·934	29·837	29·731	29·648	29·525	29·512	29·561	29·666	29·808	29·919	29·984	29·760
15	29·978	29·914	29·811	29·707	29·622	29·504	29·492	29·542	29 646	29·794	29·907	29·970	29·740
16	29·975	29·908	29·809	29·693	29·602	29·487	29·479	29·531	29·639	29·791	29·906	29·968	29·732
17	29·981	29·912	29·799	29·678	29·599	29 487	29·476	29·529	29·641	29·796	29·915	29·976	29·732
18	29·989	29·917	29·808	29·694	29·613	29·497	29·486	29·538	29·652	29·806	29·927	29·989	29·743
19	30·009	29·934	29·825	29·716	29·638	29·520	29·508	29·554	29·674	29·828	29·950	30·009	29·764
20	30·022	29·954	29·848	29·742	29·663	29·541	29·528	29·581	29·696	29·843	29·965	30·023	29·784
21	30·040	29·971	29·872	29·764	29·683	29·559	29·549	29·606	29·719	29·862	29·977	30·038	29·803
22	30·044	29·977	29·877	29·775	29·694	29·572	29·562	29·617	29·726	29·865	29·980	30·042	29·811
23	30·040	29·977	29·875	29·774	29·692	29·572	29·563	29·617	29·724	29·861	29·977	30·039	29·802
Mean	30·030	29·963	29·861	29·753	29·670	29·543	29·531	29·583	29·696	29·844	29·961	30·024	29·788

TABLE II

Normals of Surface Air Temperature.

(1901–1920.)

Hour.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Year.
0	60·4	64·8	73·8	79·5	81·2	82·0	81·4	81·5	80·5	77·0	68·3	59·9	74·3
1	59·7	64·4	73·2	79·0	80·8	81·6	81·3	81·0	80·3	76·7	67·8	59·3	73·8
2	59·3	63·7	72·7	78·6	80·5	81·4	81·1	80·8	80·1	76·5	67·5	59·4	73·4
3	58·9	63·3	72·2	78·2	80·2	81·2	80·9	80·6	79·9	76·2	67·1	58·5	73·1
4	58·6	62·9	71·8	77·8	79·9	80·9	80·7	80·3	79·6	76·1	66·8	58·3	72·8
5	58·2	62·4	71·3	77·5	79·7	80·8	80·6	80·3	79·6	75·8	66·4	57·8	72·5
6	57·9	62·2	71·0	77·4	80·0	81·0	80·7	80·2	79·5	75·7	66·2	57·5	72·4
7	57·6	62·0	71·5	78·7	81·6	82·2	81·6	81·1	80·8	76·6	66·9	57·4	73·8
8	59·5	64·2	74·2	81·3	84·1	83·9	82·9	82·4	82·1	78·7	69·4	60·0	75·2
9	63·4	67·9	77·6	84·4	86·7	86·0	84·3	83·7	83·8	80·8	72·4	63·8	77·9
10	66·9	71·2	80·7	87·2	89·1	87·4	85·1	84·8	84·7	82·4	75·0	67·2	80·1
11	69·5	73·8	83·2	89·5	90·8	88·3	86·2	85·6	85·6	83·6	76·9	69·8	81·9
12	71·5	75·9	85·2	91·3	92·4	89·5	87·0	86·3	86·3	84·4	78·2	71·6	83·3
13	73·0	77·3	86·3	92·8	93·3	89·9	87·4	86.5	86·4	84·8	79·0	72·9	84·1
14	73·9	78·3	87·7	93·5	94·1	90·1	87·3	86·4	86·5	85·1	79·6	73·7	84·7
15	74·3	78·8	88·3	93·8	94·0	89·9	87·1	86·1	86·3	85·0	79·6	74·0	84·8
16	74·2	78·7	88·3	92·9	93·1	89·3	86·7	85·7	85·7	84·6	79·3	73·8	84·4
17	72·9	77·8	86·6	90·2	90·9	88·2	85·7	84·9	84·6	83·1	77·0	71·4	82·8
18	68·4	74·2	83·2	87·1	88·4	86·6	84·8	83·9	83·2	80·6	73·9	66·9	80·1
19	65·7	70·9	79·8	84·4	86·2	84·9	83·5	82·8	82·2	79·3	71·9	64·5	78·0
20	64·2	69·0	78·1	82·7	84·2	83·8	82·9	82·4	81·7	78·5	70·5	63·3	76·8
21	62·9	67·8	76·6	81·5	83·1	83·3	82·4	82·0	81·4	77·9	69·9	61·9	75·9
22	62·0	66·7	75·6	80·7	82·3	82·7	82·1	81·8	81·1	77·5	69·0	61·1	75·2
23	61·2	65·8	74·6	80·1	81·7	82·3	81·8	81·5	80·8	77·1	68·4	60·4	74·6
Mean	64·8	69·3	78·5	84·2	85·8	84·9	83·6	83·0	82·6	79·8	72·0	64·4	77·7

TABLE III.

Normals of Maximum and Minimum Temperature.

	Maximum. (33 years)	Minimum. (33 years)	Wet Minimum. (1901–1920)	Grass Minimum. (1901–1920)
January ..	77·3	55·5	54·6	49·8
February ..	82·0	60·0	58·6	54·7
March ..	90·9	69·3	65·5	64·0
April ..	95·6	75·7	71·8	71·6
May ..	94·5	77·5	74·5	74·7
June ..	91·5	78·8	76·6	76·8
July ..	88·4	78·6	77·3	77·1
August ..	87·6	78·4	77·4	76·9
September	88·0	78·0	76·7	76·0
October ..	87·2	74·3	72·9	71·0
November	82·0	64·3	63·0	59·8
December	77·0	56·0	54·5	49·4
Year ..	86·8	70·5	68·6	66·8

TABLE IV.

Normals of Ground Temperature.

(1890–1904.)

	Surface.			1 ft. depth.			3 ft. depth.			6 ft. depth.
	5¾ h.	13¾ h.	21¾ h.	5¾ h.	13¾ h.	21¾ h.	5¾ h.	13¾ h.	21¾ h.	13¾ h.
January ..	54·0	79·0	57·7	67·7	67·7	68·3	71·6	72·2	71·7	77·3
February ..	60·5	87·2	63·7	72·3	72·0	73·2	73·9	74·3	74·1	76·6
March ..	68·8	103·9	72·7	79·7	79·3	80·8	79·1	79·3	79·2	78·1
April ..	76·3	112·4	79·6	86·9	86·2	88·2	84·9	84·9	85·0	81·2
May ..	80·3	108·0	81·8	89·3	88·4	90·6	88·0	87·7	88·0	83·9
June ..	80·9	97·5	82·1	87·2	86·8	87·8	87·3	87·1	87·2	85·0
July ..	80·9	93·6	82·1	86·1	85·6	86·5	86·2	86·0	86·2	84·9
August	80·7	93·4	82·3	85·9	85·5	86·3	86·2	85·9	86·2	84·8
September	80·3	94·0	81·9	86·0	85·3	86·3	86·4	85·9	86·4	84·9
October ..	75·3	93·4	77·3	83·5	83·1	83·8	85·2	84·9	85·1	84·8
November	64·1	87·8	67·1	76·6	76·5	76·9	80·7	80·8	80·5	83·5
December ..	53·9	79·9	57·4	68·8	69·3	69·1	74·3	75·1	74·3	80·5
Mean ..	71·3	94·2	73·8	80·8	80·5	81·5	82·0	82·0	82·0	82·1

TABLE V.

NORMALS OF WET BULB TEMPERATURE.

(1901–1920.)

HOUR.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Year.
0	57·9	61·9	70·2	75·4	77·1	78·9	79·0	78·9	78·4	75·0	65·8	57·2	71·3
1	57·5	61·5	70·0	75·1	77·0	78·8	78·8	78·9	78·3	74·7	65·6	57·0	71·1
2	57·1	61·2	69·6	74·9	77·0	78·7	78·7	78·6	78·2	74·7	65·3	56·6	70·9
3	56·8	60·9	69·4	74·7	76·9	78·7	78·6	78·6	78·1	74·5	65·0	56·2	70·7
4	56·4	60·4	69·1	74·5	76·7	78·5	78·5	78·4	77·9	74·3	64·7	55·8	70·4
5	56·1	60·1	68·8	74·4	76·7	78·4	78·6	78·3	77·8	74·2	64·4	55·5	70·3
6	55·8	59·8	68·5	74·2	77·0	78·5	78·7	78·3	77·7	74·1	64·2	55·1	70·1
7	55·6	59·9	68·8	75·1	78·0	79·2	79·1	78·9	78·5	74·8	64·5	55·1	70·6
8	56·8	60·8	70·0	76·5	79·0	80·0	79·5	79·4	79·1	75·7	65·4	56·6	71·6
9	58·5	62·0	70·7	77·2	79·8	80·7	80·1	79·9	79·5	75·9	66·7	58·4	72·5
10	59·7	62·8	70·8	77·5	80·4	81·2	80·6	80·4	79·8	76·1	67·2	59·7	73·0
11	60·5	63·3	70·9	77·7	80·9	81·6	81·0	80·7	80·0	76·2	67·6	60·5	73·4
12	61·1	63·7	70·8	77·7	81·1	81·9	81·3	80·9	80·3	76·3	68·2	60·8	73·7
13	61·6	64·0	70·9	77·9	81·3	82·0	81·4	81·1	80·2	76·1	67·7	61·2	73·8
14	61·9	64·2	71·0	78·0	81·4	82·1	81·5	81·1	80·2	76·1	67·2	61·3	73·8
15	61·9	64·2	71·0	77·7	81·2	81·9	81·4	81·0	80·0	76·0	67·3	61·3	73·7
16	62·0	64·2	71·1	77·8	80·9	81·7	81·2	80·8	79·9	75·9	67·5	61·4	73·7
17	62·2	64·1	71·1	77·5	80·2	81·4	81·1	80·5	79·8	76·3	67·9	62·2	73·7
18	61·6	64·4	71·4	77·2	79·6	80·7	80·3	80·1	79·4	75·9	67·9	60·9	73·3
19	60·9	63·8	70·9	76·6	78·7	80·0	79·9	79·6	79·1	75·6	67·4	60·1	72·7
20	60·2	63·3	70·8	76·1	78·3	79·6	79·5	79·5	79 0	75·5	67·1	59·5	72·4
21	59·6	63·0	70·8	75·9	77·9	79·1	79·4	79·3	78·8	75·3	66·7	58·9	72·1
22	59·1	62·6	70·9	75·8	77·6	79·2	79·2	79·2	78·7	75·1	66·3	58·3	71·8
23	58·5	62·4	70·7	75·7	77·3	79·1	79·1	79·0	78·6	75·0	66·0	57·8	71·6
Mean ..	59·1	62·4	70·3	76·3	78·8	80·1	79·9	79·6	79·1	75·4	66·4	58·6	72·2

TABLE VI.

Normals of Relative Humidity.

(1901–1920.)

Hour.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Year.
	%	%	%	%	%	%	%	%	%	%	%	%	%
0	86	84	83	82	83	87	89	90	91	91	88	86	87
1	87	85	85	83	84	88	90	90	91	91	88	86	87
2	87	86	86	84	85	88	90	91	91	92	89	86	88
3	87	86	86	85	85	89	90	91	92	92	89	86	88
4	87	86	87	85	86	89	90	91	92	92	89	86	88
5	87	86	87	86	87	89	91	92	92	92	89	86	89
6	87	86	87	87	87	89	91	92	92	92	89	86	89
7	87	86	87	85	85	87	89	90	91	92	88	86	88
8	84	82	81	79	79	84	87	87	87	86	82	80	83
9	74	70	70	71	73	80	83	84	83	79	72	71	76
10	64	61	61	65	68	77	81	82	80	74	65	62	70
11	57	54	54	58	64	74	79	80	78	70	60	55	65
12	55	51	50	55	61	73	79	79	77	69	58	52	63
13	51	48	46	51	59	72	77	79	77	68	55	49	61
14	47	44	42	49	57	71	77	79	76	66	52	46	59
15	46	42	41	49	57	71	78	80	76	66	52	45	59
16	47	42	42	50	59	73	79	80	78	66	54	46	60
17	52	45	46	56	62	75	80	82	81	72	63	55	64
18	66	57	55	63	67	77	82	84	85	80	74	70	72
19	74	66	63	69	73	81	85	86	87	84	79	76	77
20	79	71	69	73	76	83	86	88	88	87	82	80	80
21	81	75	75	76	79	85	87	88	89	88	85	83	83
22	83	78	78	79	80	86	88	89	89	89	86	84	84
23	85	82	82	81	82	86	89	90	90	90	87	85	86
Mean ..	73	69	68	71	74	81	85	86	86	82	76	72	77

TABLE VII.

Normals of Absolute Humidity.

(Vapour tension in inches of mercury.)

(1901–1920.)

Hour.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Year.
0	·454	·523	·705	·834	·883	·952	·964	·954	·947	·845	·610	·443	·759
1	·448	·519	·697	·827	·883	·950	·958	·958	·946	·841	·615	·435	·756
2	·443	·515	·696	·822	·884	·947	·956	·954	·942	·838	·600	·428	·752
3	·437	·509	·689	·818	·883	·945	·952	·952	·937	·835	·594	·423	·748
4	·431	·505	·683	·817	·881	·944	·949	·948	·934	·832	·588	·417	·744
5	·426	·497	·677	·813	·883	·942	·946	·945	·930	·828	·576	·414	·740
6	·422	·494	·670	·815	·890	·947	·949	·945	·930	·826	·577	·407	·739
7	·420	·492	·677	·836	·913	·962	·962	·960	·952	·846	·583	·407	·751
8	·431	·500	·687	·850	·927	·975	·974	·965	·954	·851	·595	·417	·761
9	·431	·485	·668	·840	·929	·985	·979	·971	·953	·831	·583	·420	·756
10	·422	·470	·635	·819	·926	·987	·983	·978	·956	·820	·569	·417	·749
11	·413	·450	·604	·798	·923	·985	·989	·984	·954	·807	·554	·405	·739
12	·407	·435	·571	776	·916	·992	·996	·986	·955	·802	·540	·393	·731
13	·400	·425	·556	·760	·909	·992	·997	·991	·946	·789	·530	·385	·723
14	·396	·419	·540	·760	·907	·990	·999	·990	·949	·785	·529	·379	·720
15	·393	·414	·537	·756	·899	·987	1·000	·991	·951	·780	·526	·376	·717
16	·397	·413	·542	·758	·893	·983	·999	·987	·953	·784	·538	·380	·719
17	·422	·427	·564	·775	·892	·981	·990	·982	·955	·816	·582	·425	·734
18	·462	·481	·617	·804	·896	·976	·984	·978	·957	·834	·610	·459	·755
19	·473	·503	·643	·812	·896	·963	·974	·971	·956	·844	·618	·463	·760
20	·473	·510	·665	·818	·894	·956	·971	·969	·956	·844	·619	·463	·761
21	·469	·516	·684	·824	·893	·955	·966	·965	·952	·844	·617	·460	·762
22	·465	·520	·699	·833	·887	·949	·966	·965	·951	·844	·615	·454	·762
23	·462	·525	·705	·837	·886	·950	·964	·961	·950	·841	·611	·448	·762
Mean	·433	·481	·642	·808	·899	·966	·974	·969	·949	·825	·582	·422	·746

TABLE VIII.

Normals of Rainfall.

(1905–1924.)

Hour.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
1	0·02	0·19	0·15	0·06	0·15	0·36	0·47	0·68	0·17	0·10	0·02	0·01
2	0·02	0·07	0·07	0·08	0·10	0·47	0·43	0·55	0·21	0·19	0·01	0·01
3	0·03	0·05	0·05	0·02	0·13	0·52	0·43	0·57	0·39	0·20	0·02	0·02
4	0·01	0·03	0·02	0·05	0·04	0·38	0·53	0·43	0·20	0·15	0·04	0·01
5	0·02	0·03	0·05	0·01	0·03	0·46	0·59	0·66	0·26	0·21	0·04	0·00
6	0·01	0·09	0·03	0·00	0·05	0·54	0·67	0·56	0·39	0·22	0·02	0·01
7	0·04	0·05	0·03	0·00	0·04	0·46	0·68	0·49	0·48	0·13	0·02	0·00
8	0·01	0·05	0·01	0·00	0·03	0·39	0·50	0·61	0·37	0·10	0·01	0·01
9	0·00	0·02	0·05	0·01	0·07	0·43	0·38	0·27	0·38	0·14	0·01	0·01
10	0·01	0·02	0·02	0·01	0 03	0·50	0·62	0·39	0·42	0·15	0·05	0·01
11	0·00	0·02	0·02	0·08	0·05	0·52	0·42	0·60	0·71	0·27	0·01	0·01
12	0·00	0·02	0·02	0·00	0·07	0·59	0·64	0·56	0·50	0·28	0·00	0·00
13	0·00	0·02	0·03	0·01	0·15	0·64	0·75	0·90	1·01	0·32	0·01	0·01
14	0·01	0·02	0·02	0·03	0·07	0·68	0·74	1·14	0·42	0·27	0·01	0·01
15	0·01	0·03	0·02	0·04	0·23	0·83	0·85	0·82	0·56	0·38	0·06	0·00
16	0·00	0·05	0·04	0·05	0·44	0·59	0·80	0·86	0·64	0·28	0·01	0·00
17	0·01	0·05	0·09	0·12	0·33	0·69	0·77	0·65	0·45	0·17	0·04	0·00
18	0·01	0·11	0·12	0·19	0·39	0·73	0·62	0·50	0·37	0·31	0·02	0·00
19	0·00	0·07	0·24	0·30	0·80	0·57	0·44	0·57	0·23	0·24	0·01	0·00
20	0·02	0·12	0·10	0·13	0·53	0·55	0·88	0·27	0·23	0·15	0·01	0·00
21	0·02	0·05	0·11	0·19	0·53	0·50	0·51	0·42	0·23	0·10	0·01	0·00
22	0·05	0·03	0·17	0·32	0·39	0·58	0·51	0·41	0·22	0·12	0·00	0·00
23	0·01	0·05	0·06	0·12	0·19	0·46	0·47	0·36	0·13	0·16	0·01	0·00
24	0·05	0·04	0·05	0·11	0·18	0·43	0·27	0·37	0·13	0·09	0·02	0·01
Month's total ..	0·36	1·28	1·57	1·93	5·02	12·87	13·97	13·64	9·10	4·73	0·46	0·13

TABLE IX.

Relative Frequency of Clouds—8 Hrs.

(1901–1920.)

Number of occasions in a month.

	Ci.	Ci.-St.	Ci.-Cu.	A.-Cu.	A.-St.	Nb.	Cu.-Nb.	Cu.	St.-Cu.	St.	Fr.-Cu.	Fr.-Nb	Fog.	Clear Skies.
January ..	4·6	2·2	1·0	2·1	0·2	1·5	1·4	2·3	0·7	0·6	0	0	1·4	18·8
February ..	1·2	1·0	0·7	1·8	0·2	2·4	2·9	3·1	0·6	1·0	0·1	0·1	1·4	16·4
March ..	2·8	1·5	1·2	2·1	0·3	2·1	4·5	6·6	0·7	0·6	0·6	0	0·8	14·7
April ..	2·1	2·0	1·2	2·7	0·3	2·5	8·6	9·8	0·2	0·2	1·7	0·1	0	9·6
May ..	2·5	1·8	1·7	2·7	0·5	3·7	10·9	12·6	0·3	0	1·5	0·2	0	5·3
June ..	3·4	3·4	2·0	2·3	1·3	12·7	15·7	9·7	0·1	0·1	0·9	0·3	0	1·0
July ..	3·1	2·7	1·9	3·1	2·5	14·8	17·9	7·6	0·5	0·1	0·9	0·9	0	0·1
August ..	2·4	3·7	1·7	2·8	1·5	14·6	19·0	10·2	0·3	0	0·9	0·3	0	0
September ..	5·1	5·0	1·8	2·1	1·3	9·5	15·2	11·9	0·2	0	0·7	0·3	0·1	1·2
October ..	3·8	3·1	1·9	2·8	0·3	4·3	6·2	7·3	0·3	0·1	0·4	0·1	0	12·1
November ..	5·2	2·3	0·9	2·8	0·3	1·7	2·3	2·4	0·4	0	0·1	0·1	0	17·3
December ..	4·8	2·5	0·9	1·7	0·1	0·7	0·9	1·9	1·1	0·1	0	0·1	0·1	20·9

TABLE X.

Relative Frequency of Clouds—10 Hrs.

(1901–1920.)

Number of occasions in a month.

	Ci.	Ci.-St.	Ci.-Cu.	A.-Cu.	A.-St.	Nb.	Cu.-Nb.	Cu.	St.-Cu.	St.	Fr.-Cu.	Fr.-Nb.	Fog.	Clear Skies.
January ..	3·5	2·7	0·7	1·5	0·2	1·1	2·3	3·2	0·7	0·6	0·3	0	0·3	19·6
February ..	2·0	1·6	1·4	1·9	0·3	1·7	2·7	4·1	0·3	0·3	0·1	0·1	0·1	17·0
March ..	2·7	2·1	0·7	1·7	0·2	1·3	5·1	7·0	0·3	0·1	0·1	0	0	16·7
April ..	2·5	2·3	1·1	1·9	0·3	1·3	5·7	10·4	0·1	0·1	0·7	0	0	12·1
May ..	2·3	1·9	1·5	1·7	0·7	3·1	10·1	14·7	0·3	0	0·8	0·2	0	6·9
June ..	2·7	2·9	0·9	1·7	2·3	11·3	16·3	12·1	0·1	0·2	0·5	0·3	0	1·5
July ..	2·8	2·5	1·0	1·9	2·9	13·3	18·9	10·5	0·5	0	0·5	5·5	0	0·1
August ..	2·0	3·9	0·9	1·2	2·1	12·7	20·1	13·7	0·1	0	0·9	0·1	0	0
September ..	3·5	4·5	1·2	1·5	1·5	8·7	17·4	15·9	0·3	0	0·3	0·1	0	1·7
October ..	3·1	2·5	1·3	1·7	0·5	4·6	9·5	13·5	0·1	0·1	0·1	0·1	0	7·5
November ..	3·7	3·0	1·1	1·8	0·2	1·3	2·9	4·5	0·2	1·0	0·1	0·1	0	16·7
December ..	4·7	2·8	0·7	1·3	0·1	0·5	0·7	2·3	0·8	0·1	0	0	0·1	21·3

TABLE XI.

Relative Frequency of Clouds—16 Hrs.

(1901–1920.)

Number of occasions in a month.

	Ci.	Ci.-St.	Ci.-Cu.	A.-Cu.	A.-St.	Nb.	Cu.-Nb.	Cu.	St.-Cu.	St.	Fr.-Cu.	Fr.-Nb.	Fog.	Clear Skies.
January ..	5·6	3·2	0·7	1·2	0·3	1·4	2·6	5·4	0·6	0·1	0	0·1	0	16·8
February ..	2·8	2·2	1·3	1·3	0·2	1·8	3·9	8·1	0·2	0	0	0·1	0	13·7
March ..	4·2	3·2	1·0	1·5	0·5	2·3	4·5	8·9	0·2	0	0	0	0	13·7
April ..	4·3	3·8	0·6	0·9	0·8	2·5	7·3	11·2	0	0	0·1	0	0	10·4
May ..	4·1	3·9	0·9	0·5	1·1	4·6	10·5	14·4	0·1	0	0·1	0·1	0	6·5
June ..	3·9	3·9	0·4	0·8	4·1	12·8	14·9	10·2	0·1	0·1	0·5	0·7	0	1·1
July ..	3·0	5·3	0·5	0·7	3·5	15·8	19·0	10·1	0·5	0	0·3	0·5	0	0
August ..	3·7	6·1	0·9	0·7	3·5	15·3	19·7	11·1	0·5	0	0·3	0·4	0	0·1
September ..	4·7	6·5	0·9	0·6	2·5	13·1	17·0	12·0	0·3	0	0·3	0·5	0	0·4
October ..	4·1	5·2	0·9	0·9	0·7	6·4	12·0	13·0	0·1	0	0	0·1	0	6·2
November ..	4·6	3·1	1·1	1·8	0·3	2·1	4·8	7·5	0·3	0·1	0	0·1	0	12·9
December ..	6·7	3·2	0·9	1·6	0·1	0·7	1·7	3·5	0·9	0	0	0·1	0	17·9

TABLE XII.

Normals of Cloud Amount.

(1901–1920.)

Whole Sky, 10·0.

Month.	8 hrs.	10 hrs.	16 hrs.
January	2·4	2·1	2·3
February	2·7	2·2	2·4
March	2·9	2·3	2·7
April	3·7	2·9	3·2
May	4·7	4·3	4·2
June	7·5	7·5	7·6
July	8·6	8·5	8·8
August	8·5	8·4	8·7
September	6·9	7·1	7·9
October	3·7	4·3	4·7
November	2·2	2·1	2·8
December	1·6	1·5	1·9

TABLE XIII.

Normals of Hours of Bright Sunshine.*

(1889–1908.)

Hour.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
6	0·0	0·0	0·0	0·0	0·0	0·0	0·0	0·0	0·0	0·0	0·0	0·0
7	0·0	0·0	0·0	0·1	0·1	0·1	0·1	0·1	0·0	0·1	0·0	0·0
8	0·3	0 3	0·2	0·3	0·5	0·3	0·3	0·3	0·3	0·5	0·5	0·4
9	0·8	0·7	0·7	0·7	0·7	0·4	0·3	0·4	0·5	0·7	0·9	0·9
10	0·9	0·9	0·9	0·9	0·8	0·5	0·4	0·5	0·5	0·8	0·9	0·9
11	0·9	0·9	0·9	0·9	0·9	0·5	0·4	0·5	0·6	0·8	0·9	0·9
12	0·9	0·9	0·9	0·9	0·9	0·5	0·4	0·5	0·6	0·7	0·9	0·9
13	0·9	0·9	0·9	0·9	0·9	0·5	0·3	0·4	0·5	0·7	0·9	0·9
14	0·9	0·9	0·9	0·9	0·9	0·5	0·3	0·3	0·5	0·7	0·9	0·9
15	0·9	0·9	0·9	0·9	0·8	0·4	0·3	0·3	0·4	0·7	0·9	0·9
16	0·9	0·9	0·9	0·9	0·7	0·4	0·3	0·3	0·3	0·7	0·9	0·9
17	0·3	0·5	0·5	0·5	0·5	0·3	0·2	0 2	0·3	0·5	0·3	0·3
18	0·0	0·1	0·1	0·1	0·2	0·1	0·1	0·1	0·1	0·1	0·0	0·0
19	0·0	0·0	0·0	0·0	0·0	0·0	0·0	0·0	0·0	0·0	0·0	0·0
Total ..	7·7	7·9	7·8	8·0	7·9	4·5	3·4	3·9	4·6	7·0	8·0	7·9

* Reliance cannot be placed on values of hours 6, 7, 8 and 17, 18, 19, because drawbacks in situation and exposure of the instrument, *i.e.*, the presence of trees in the vicinity, have undoubtedly vitiated the results, to varying extent in different months, according to sunrise and sunset times.

TABLE XIV.

Normals of Wind Velocity.

Miles per hour.

(1901–1920.)

Hour.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Year.
1	1·1	1·7	2·7	4·0	3·7	3·3	3·0	2·5	1·8	1·1	1·1	1·0	2·3
2	1·2	1·7	2·5	3·7	3·5	3·1	2·9	2·5	1·7	1·2	1·1	1·2	2·2
3	1·3	1·6	2·4	3·4	3·1	3·1	2·8	2·4	1·8	1·1	1·2	1·2	2·1
4	1·4	1·7	2·4	3·3	3·1	3·0	2·8	2·4	1·8	1·2	1·2	1·4	2·1
5	1·5	1·7	2·3	3·1	2·9	2·9	2·8	2·4	1·7	1·2	1·4	1·4	2·1
6	1·3	1·7	2·2	2·9	2·8	2·9	2·8	2·3	1·7	1·2	1·3	1·4	2·0
7	1·2	1·7	2·2	3·2	3·4	3·4	3·3	2·6	2·0	1·3	1·4	1·4	2·3
8	1·5	1·9	2·8	4·6	4·7	4·4	4·2	3·7	3·1	2·2	1·9	1·7	3·1
9	2·1	2·8	4·1	5·5	5·5	5·0	4·8	4·3	3·8	2·9	2·6	2·3	3·8
10	3·1	3·9	5·0	6·0	5·8	5·4	5·3	4·7	4·2	3·4	3·3	3·1	4·4
11	3·8	4·7	5·3	6·2	6·3	5·5	5·4	4·9	4·4	3·7	3·9	3·9	4·8
12	4·2	5·0	5·5	6·3	6·4	5·8	5·7	5·1	4·7	4·1	4·3	4·5	5·1
13	4·3	4·9	5·3	6·1	6·1	5·8	5·6	5·0	4·6	4·1	4·2	4·5	5·0
14	4·4	4·9	5·3	6·1	6·1	5·6	5·4	4·8	4·4	3·9	4·2	4·5	5·0
15	4·4	5·0	5·3	6·1	6·3	5·5	5·3	4·5	4·2	3·9	4·1	4·5	4·9
16	4·2	4·7	5·4	6·3	6·3	5·6	5·0	4·5	4·0	3·6	3·7	4·1	4·8
17	3·1	4·1	4·7	5·9	6·0	5·1	4·6	3·9	3·5	2·8	2·5	2·8	4·1
18	1·5	2·6	3·6	5·5	5·6	4·7	4·1	3·5	2·6	1·6	1·2	1·0	3·1
19	0·9	1·7	3·0	5·3	5·3	4·3	3·6	2·9	2·0	1·2	0·9	0·7	2·7
20	0·9	1·7	3·1	5·3	5·0	4·0	3·3	2·8	2·0	1·2	0·9	0·7	2·6
21	1·0	1·8	3·1	4·9	4·7	3·9	3·2	2·6	1·9	1·2	0·9	0·7	2·5
22	1·1	1·8	3·1	4·7	4·5	3·7	3·1	2·7	2·0	1·2	0·9	0·8	2·5
23	1·1	1·8	3·1	4·5	4·4	3·4	3·0	2·5	1·9	1·2	0·9	0·9	2·4
24	1·1	1·7	2·9	4·2	4·0	3·4	3·0	2·5	1·8	1·1	0·9	0·9	2·3
Mean ..	2·2	2·8	3·6	4·9	4·8	4·3	4·0	3·4	2·8	2·1	2·1	2·1	3·3

TABLE XV.

Normals of Wind Direction.

(1901–1920.)

Hour.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
1	N 28°W	N 85°W	S 38°W	S 16°W	S 5°E	S 4°E	S 9°W	S 4°W	S 1°W	N 65°W	N 1°W	N 11°W
2	N 26°W	N 71°W	S 42°W	S 19°W	S 2°E	S 1°E	S 8°W	S 6°W	S	N 47°W	N 2°W	N 13°W
3	N 24°W	N 66°W	S 45°W	S 20°W	S 1°E	S 1°E	S 7°W	S 6°W	S 2°W	N 68°W	N 2°W	N 11°W
4	N 22°W	N 61°W	S 48°W	S 21°W	S 1°E	S 1°E	S 11°W	S 5°W	S 2°W	N 52°W	N 2°W	N 11°W
5	N 22°W	N 59°W	S 51°W	S 22°W	S 1°E	S	S 9°W	S 4°W	S 2°E	N 43°W	N 1°W	N 11°W
6	N 19°W	N 51°W	S 56°W	S 22°W	S 1°E	S 1°E	S 9°W	S 4°W	S 5°E	N 26°W	N 1°W	N 8°W
7	N 18°W	N 46°W	S 55°W	S 22°W	S 2°E	S 5°E	S 7°W	S	S 3°E	N 32°W	N 1°W	N 8°W
8	N 16°W	N 41°W	S 56°W	S 25°W	S	S 6°E	S 8°W	S 3°E	S 1°W	N 28°W	N 2°W	N 8°W
9	N 15°W	N 39°W	S 63°W	S 30°W	S 6°W	S 4°E	S 10°W	S 5°E	S 2°W	N 29°W	N 3°W	N 8°W
10	N 11°W	N 41°W	S 72°W	S 34°W	S 10°W	S	S 8°W	S 2°E	S 2°W	N 27°W	N 2°W	N 7°W
11	N 7°W	N 40°W	S 77°W	S 38°W	S 12°W	S 2°W	S 10°W	S 1°E	S 1°E	N 27°W	N 3°E	N 4°W
12	N 11°W	N 49°W	S 86°W	S 40°W	S 14°W	S 5°W	S 10°W	S	S 2°E	N 26°W	N	N 8°W
13	N 24°W	N 59°W	S 82°W	S 39°W	S 13°W	S	S 9°W	S 2°W	S 3°E	N 30°W	N 7°W	N 14°W
14	N 34°W	N 63°W	S 80°W	S 35°W	S 11°W	S 2°W	S 5°W	S 1°W	S 3°E	N 35°W	N 10°W	N 18°W
15	N 36°W	N 66°W	S 74°W	S 31°W	S 9°W	S 1°E	S 3°W	S 3°E	S 5°E	N 44°W	N 13°W	N 18°W
16	N 35°W	N 71°W	S 70°W	S 26°W	S 8°W	S 2°E	S 3°W	S 3°E	S 1°E	N 32°W	N 12°W	N 17°W
17	N 34°W	N 67°W	S 67°W	S 25°W	S 4°W	S 5°E	S 4°W	S 3°E	S	N 38°W	N 8°W	N 14°W
18	N 29°W	N 61°W	S 63°W	S 22°W	S 1°E	S 4°E	S 4°W	S 1°E	S 3°W	N 37°W	N 3°W	N 12°W
19	N 31°W	N 69°W	S 54°W	S 16°W	S 1°E	S 3°E	S 6°W	S 3°W	S 7°W	N 55°W	N	N 12°W
20	N 33°W	N 77°W	S 44°W	S 12°W	S 2°E	S 4°E	S 7°W	S 4°W	S 6°W	N 53°W	N 2°W	N 12°W
21	N 32°W	N 82°W	S 35°W	S 9°W	S 5°E	S 3°E	S 6°W	S 4°W	S 3°W	N 79°W	N 3°W	N 11°W
22	N 33°W	W	S 34°W	S 9°W	S 6°E	S 4°E	S 6°W	S 3°W	S 2°W	N 71°W	N 3°W	N 13°W
23	N 33°W	N 88°W	S 33°W	S 10°W	S 5°E	S 5°E	S 5°W	S 3°W	S 1°W	N 61°W	N 2°W	N 10°W
24	N 29°W	N 88°W	S 34°W	S 13°W	S 6°E	S 5°E	S 6°W	S 4°W	S 4°W	N 71°W	N 3°W	N 11°W

TABLE XVI.

Percentage Frequency of Wind Direction : January.

(1901–1920.)

Hour.	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Calm.
1	31·9	3·6	2·6	2·0	3·0	7·6	8·9	15·8	24·7
2	33·1	4·6	2·0	2·0	2·3	7·3	8·6	17·2	22·8
3	34·5	4·9	2·6	1·6	2·3	6·9	8·9	17·4	20·8
4	37·1	6·0	2·0	1·7	2·3	6·0	9·3	18·2	17·5
5	36·0	6·6	1·7	2·3	2·3	6·3	9·2	18·2	17·5
6	36·7	7·0	1·7	2·0	2·0	6·0	7·9	16·8	20·1
7	36·7	7·3	2·3	1·7	2·0	5·6	8·3	15·5	20·8
8	37·0	8·3	2·7	1·7	2·0	5·3	7·3	17·2	18·8
9	41·4	9·5	3·6	1·6	2·9	6·2	7·8	18·3	8·8
10	42·6	11·6	6·6	1·7	1·7	6·3	9·3	18·2	2·3
11	42·4	11·9	9·0	1·7	2·3	6·6	9·0	16·9	0·3
12	39·0	10·3	9·3	2·3	3·0	8·0	9·0	18·7	0·3
13	37·9	6·4	7·1	2·4	1·7	9·4	11·8	23·2	0.3
14	33·9	4·7	5·0	2·7	2·0	10·3	14·6	26·9	0·0
15	33·3	4·0	4·0	3·0	2·6	7·9	16·2	28·7	0·3
16	33·3	3·6	4·3	2·3	4·3	6·9	15·5	29·0	0·7
17	35·2	4·3	3·7	1·6	4·0	7·0	15·3	26·6	2·3
18	35·2	4·0	2·7	1·6	3·7	6·6	12·0	19·9	14·3
19	27·4	3·3	3·0	1·3	3·3	6·3	9·9	15·5	30·0
20	25·5	3·3	2·6	1·7	4·0	7·0	9·6	14·3	32·1
21	26·1	4·3	2·6	1·7	3·6	7·6	9·3	14·2	30·7
22	28·1	4·0	2·6	2·3	3·7	7·9	10·9	14·3	26·1
23	28·3	3·7	3·0	2·0	3·3	7·7	11·3	16·3	24·3
24	29·9	4·0	3·7	2·3	3·0	8·0	10·3	15·3	23·6
Mean ..	34·3	5·9	3·8	2·0	2·8	7·1	10·4	18·9	15·0

TABLE XVII.

Percentage Frequency of Wind Direction: February.

(1901–1920.)

Hour.	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Calm.
1	17·4	4·0	6·2	3·6	10·1	20·7	13·8	13·1	11·3
2	19·3	4·7	6·5	3·3	8·9	19·0	12·5	14·7	11·1
3	21·5	4·3	5·0	2·9	9·3	18·3	11·1	15·4	12·2
4	21·9	5·4	4·3	2·5	8·2	18·3	11·1	15·1	13·3
5	23·7	5·4	4·3	2·5	7·9	18·3	12·2	14·7	11·1
6	24·7	6·1	4·7	1·8	8·2	16·8	9·7	13·9	14·3
7	24·1	6·8	4·7	1·8	7·2	15·5	10·1	15·1	14·7
8	24·8	7·9	4·7	1·8	6·8	15·1	9·7	15·8	13·3
9	25·8	9·7	6·8	2·5	6·8	16·5	11·8	15·4	4·7
10	23·0	12·8	7·7	4·0	4·8	17·9	15·3	14·2	0·4
11	24·9	9·7	9·0	4·0	4·3	17·0	15·5	15·2	0·4
12	23·5	6·9	9·0	3·6	5·4	17·0	16·2	18·4	0·0
13	20·4	6·1	6·8	3·2	5·4	17·6	18·7	21·9	0·0
14	19·0	4·7	5·7	2·9	4·7	17·6	21·5	24·0	0·0
15	16·2	5·0	5·0	2·2	5·4	16·6	23·8	25·6	0·4
16	15·1	3·6	5·4	2·5	7·2	16·9	22·7	26·3	0·4
17	18·4	4·3	5·4	2·5	7·6	15·5	23·1	22·8	0·4
18	20·5	4·7	4·7	1·8	7·6	14·8	20·5	22·7	2·9
19	17·5	3·9	3·9	1·8	7·8	16·0	16·4	17·5	15·3
20	15·7	4·7	3·9	2·5	8·2	18·9	15·0	15·7	15·4
21	15·3	4·6	5·0	2·5	9·6	19·9	12·5	15·0	15·7
22	15·8	4·3	5·4	2·9	10·4	22·0	13·3	12·6	13·3
23	16·2	4·7	5·4	2·9	11·2	21·6	13·7	14·0	10·4
24	16·4	4·7	5·4	3·2	11·1	21·4	13·6	13·9	10·4
Mean ..	20·0	5·8	5·6	2·7	7·7	17·9	15·2	17·2	8·0

TABLE XVIII.

Percentage Frequency of Wind Direction: March.

(1901–1920.)

Hour.	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Calm.
1	5·5	2·9	2·9	6·5	22·3	37·7	9·7	7·4	5·1
2	6·1	1·9	3·5	6·1	20·3	37·7	10·7	8·1	5·5
3	7·4	1·6	3·5	5·8	19·7	36·4	10·0	10·3	5·2
4	7·1	1·9	3·5	4·9	18·7	35·5	11·0	10·3	7·1
5	8·1	2·3	3·2	5·8	16·1	33·9	10·0	11·3	9·4
6	8·4	2·3	2·6	5·8	14·3	32·1	11·0	12·0	11·6
7	8·7	2·9	2·9	5·5	14·9	31·3	11·3	10·7	11·9
8	10·7	2·6	3·6	6·2	15·2	32·2	10·7	12·0	6·8
9	10·3	4·5	3·2	5·5	13·2	35·2	12·9	13·5	1·6
10	12·6	4·2	3·9	3·2	11·0	35·3	15·9	13·6	0·3
11	12·9	4·9	5·2	3·2	10·0	32·4	17·2	14·3	0·0
12	14·2	4·9	5·5	2·9	9·4	28·1	19·7	15·2	0·3
13	12·0	3·2	4·9	3·6	10·0	27·8	21·7	16·8	0·0
14	10·6	3·2	2·9	3·6	11·9	27·0	23·5	17·1	0·3
15	7·1	2·9	4·2	3·9	13·0	25·6	27·2	15·9	0·3
16	6·2	2·3	3·6	4·2	16·6	23·7	26·6	16·6	0·3
17	6·8	1·9	3·9	4·2	19·0	22·9	24·9	16·1	0·3
18	8·4	1·9	2·9	4·2	21·3	22·9	20·7	14·9	2·9
19	8·1	1·9	3·6	4·2	22·3	24·9	15·9	12·3	6·8
20	7·2	2·3	3·6	4·2	26·3	26·0	12·0	11·1	7·5
21	5·8	2·3	3·9	5·2	28·7	28·7	10·3	8·4	6·8
22	5·5	1·9	4·2	5·5	28·4	33·2	8·7	9·0	3·6
23	6·1	2·3	3·9	6·1	28·0	34·7	8·4	7·1	3·6
24	5·5	2·3	2·9	6·2	25·9	37·9	8·4	6·2	4·9
Mean ..	8·4	2·7	3·7	4·9	18·2	31·0	14·9	12·1	4·3

TABLE XIX.

Percentage Frequency of Wind Direction: April.

(1901–1920.)

Hour.	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Calm.
1	1·7	1·7	4·3	11·3	35·6	37·6	4·3	2·0	1·7
2	1·7	1·3	3·7	10·7	34·0	39·7	5·0	2·3	1·7
3	1·3	1·0	3·7	10·7	32·3	41·0	5·3	2·0	2·7
4	1·3	1·7	4·3	9·7	29·9	41·9	5·7	2·0	3·7
5	1·7	1·4	4·4	9·4	30·1	40·5	6·4	2·0	4·0
6	1·0	1·3	4·3	10·3	29·3	41·0	6·0	3·0	3·7
7	1·0	1·4	4·4	10·7	29·4	40·8	6·0	3·4	3·0
8	1·7	1·7	4·0	9·1	29·2	44·0	6·4	3·7	0·4
9	1·7	1·7	3·0	6·7	27·8	47·8	7·7	3·7	0·0
10	2·3	1·0	3·0	5·0	26·9	46·9	10·3	4·3	0·3
11	3·0	1·0	2·7	5·0	25·3	44·7	12·0	6·3	0·0
12	4·0	1·0	3·0	4·0	27·1	39·8	14·1	7·0	0·0
13	3·0	1·0	2·3	3·7	30·0	37·0	16·7	6·3	0·0
14	3·0	1·0	3·0	4·4	32·8	35·1	15·7	5·0	0·0
15	2·0	0·7	3·0	5·7	35·1	34·8	14·4	4·4	0·0
16	1·7	0·7	3·3	6·3	39·3	31·0	12·7	5·0	0·0
17	2·0	0·7	2·7	5·7	41·8	31·5	10·7	5·0	0·0
18	3·0	1·0	2·7	6·1	44·0	28·5	8·4	5·0	1·4
19	1·7	1·0	3·7	7·7	45·8	28·4	6·7	3·7	1·8
20	2·7	2·0	4·0	10·4	45·2	26·8	5·0	3·4	0·7
21	1·7	1·4	6·4	9·8	46·5	27·3	4·4	2·4	0·4
22	1·7	1·3	7·0	10·3	44·3	28·7	3·3	2·7	0·7
23	2·3	1·0	6·0	12·0	41·7	31·0	3·3	2·3	0·3
24	2·0	1·7	5·0	12·4	37·1	35·1	3·7	2·4	0·7
Mean ..	2·1	1·2	3·9	8·2	35·0	36·7	8·1	3·7	1·1

TABLE XX.

Percentage Frequency of Wind Direction: May.

(1901–1920.)

Hour.	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Calm.
1	2·0	3·0	8·9	20·5	35·8	22·5	2·7	2·3	2·3
2	1·3	3·0	7·2	21·7	33·9	24·0	3·9	1·6	3·3
3	1·6	3·0	7·2	19·4	33·6	24·4	3·6	2·3	4·9
4	2·0	2·3	7·9	20·2	32·5	25·8	3·7	2·0	3·6
5	2·0	2·9	7·2	20·0	32·5	24·9	3·6	2·3	4·6
6	2·3	2·9	6·9	20·0	30·5	25·3	3·6	2·9	5·6
7	2·7	3·7	9·4	18·5	33·2	24·5	3·7	2·7	1·7
8	3·6	4·3	10·2	15·1	33·6	27·3	3·3	2·3	0·3
9	3·3	3·6	9·5	14·1	31·5	31·5	4·3	2·0	0·3
10	3·0	3·0	8·9	12·2	32·9	32·6	5·3	2·0	0·3
11	1·7	3·0	9·2	10·2	34·0	34·7	4·9	2·3	0·0
12	2·0	2·3	7·6	10·6	35·3	33·0	6·9	2·3	0·0
13	2·3	2·3	6·9	10·9	37·6	31·7	6·3	2·0	0·0
14	2·0	2·0	7·5	10·5	39·0	30·5	5·9	2·3	0·3
15	2·3	2·3	6·9	11·2	40·9	29·7	4·0	2·3	0·3
16	2·3	3·0	5·9	11·9	42·5	28·6	3·6	2·0	0·3
17	2·3	2·0	6·9	13·5	44·8	24·7	3·6	2·0	0·3
18	3·0	2·3	8·2	15·5	43·8	22·1	3·3	1·6	0·3
19	3·3	2·3	7·3	16·2	43·6	20·1	3·0	3·0	1·3
20	3·3	2·3	7·6	17·4	42·5	19·4	3·6	3·0	1·0
21	2·3	3·6	8·9	18·1	41·8	18·8	3·6	2·0	1·0
22	3·0	3·0	8·2	19·4	41·5	18·8	2·3	2·3	1·6
23	2·3	3·0	8·6	19·8	39·2	21·1	3·6	1·6	1·0
24	2·3	3·0	8·6	20·7	38·2	20·1	3·0	2·3	2·0
Mean ..	2·4	2·8	8·0	16·1	37·3	25·7	4·0	2·2	1·5

TABLE XXI.

Percentage Frequency of Wind Direction: June.

(1901–1920.)

Hour.	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Calm.
1	1·7	2·3	7·3	21·7	36·5	19·4	5·0	1·7	4·3
2	1·7	2·3	7·7	20·3	34·9	21·3	5·6	2·0	4·3
3	1·7	2·3	8·3	19·7	33·7	21·0	5·6	2·7	5·0
4	1·7	2·3	8·4	19·8	32·2	22·1	5·7	2·7	5·0
5	2·0	2·3	8·4	19·5	31·2	23·2	5·4	3·0	5·0
6	1·3	2·3	8·9	20·5	31·4	21·4	6·9	2·3	5·0
7	1·3	3·3	10·0	21·6	31·3	21·0	6·3	2·0	3·0
8	2·3	3·0	11·3	22·2	29·5	22·9	6·3	1·7	1·0
9	2·3	3·0	12·3	20·9	27·2	25·5	6·3	1·7	1·0
10	1·7	3·0	13·1	19·2	24·6	30·0	5·7	2·4	0·3
11	2·3	3·7	12·4	18·5	23·5	28·5	7·4	3·0	0·7
12	2·7	3·7	13·1	14·4	27·1	27·1	9·0	2·7	0·3
13	2·3	4·0	13·6	16·6	26·9	24·9	9·0	2·7	0·0
14	2·3	3·0	12·7	17·1	27·4	26·4	7·7	3·0	0·3
15	2·7	4·0	11·6	16·2	32·5	22·9	6·3	3·7	0·3
16	3·0	3·0	11·0	17·0	35·7	20·7	6·0	3·3	0·3
17	2·3	2·3	11·0	20·3	35·7	20·0	5·7	2·3	0·3
18	2·4	2·4	9·1	20·6	36·0	20·6	5·1	2·4	1·7
19	2·3	2·0	7·7	21·7	35·8	20·4	4·7	2·3	3·0
20	2·7	2·0	8·0	21·3	36·9	19·6	4·3	2·7	2·7
21	1·7	2·3	7·0	22·9	35·8	20·9	5·0	2·3	2·3
22	1·7	2·0	7·0	23·1	37·1	20·1	5·0	2·3	1·7
23	2·3	2·3	7·7	22·5	36·3	19·1	5·4	2·0	2·3
24	2·0	2·3	8·7	22·3	35·6	18·3	6·0	2·7	2·3
Mean ..	2·1	2·7	9·8	20·0	32·3	22·4	6·1	2·5	2·2

TABLE XXII.

Percentage Frequency of Wind Direction: July.

(1901–1920.)

Hour.	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Calm.
1	1·9	1·0	6·8	19·4	25·9	29·1	7·8	2·6	5·5
2	1·9	1·3	7·1	19·4	24·9	29·1	7·1	2·9	6·2
3	1·3	1·6	8·1	19·4	23·9	29·7	7·7	2·3	6·1
4	1·9	1·3	8·1	19·4	22·6	30·7	9·0	2·6	4·5
5	1·6	1·6	8·4	20·1	21·0	29·8	9·1	2·3	6·2
6	1·3	1·6	9·4	19·4	21·0	30·1	9·7	1·9	5·5
7	1·6	2·3	10·7	19·0	21·0	31·0	8·7	2·3	3·6
8	1·6	2·9	13·3	16·8	19·7	31·4	10·7	1·9	1·6
9	1·9	1·9	14·5	16·7	18·0	31·8	11·9	2·2	1·0
10	1·6	1·9	15·1	16·4	19 0	30·7	11·9	2·2	1·0
11	1·6	2·9	14·4	16·3	18·2	30·4	12·4	3·2	0·6
12	1·6	3·2	14·2	15·1	20·3	30·0	11·6	3·5	0·3
13	1·9	2·6	13·3	16·2	21·7	30·4	11·3	2·3	0·3
14	2·3	3·9	13·3	15·8	24·5	26·8	11·0	1·9	0·7
15	2·3	3·2	11·3	18·7	26·1	26·8	9·4	1·9	0·3
16	1·6	2·3	11·3	17·8	29·5	26·9	8·4	1·6	0·7
17	1·3	1·9	9·7	18·4	30·7	26·9	7·8	2·3	1·0
18	1·6	1·0	8·1	19·8	33·1	25·0	7·8	2·6	1·0
19	1·6	1·6	7·4	18·4	31·7	26·8	7·8	2·3	2·3
20	1·6	1·3	6·8	19·7	30·7	26·8	7·4	2·9	2·9
21	1·0	1·0	6·8	19·3	31·9	25·5	7·4	3·2	3·9
22	1·3	1·3	7·1	19·8	30·7	25·9	7·4	3·2	3·2
23	1·0	1·6	7·4	20·3	29·3	26·8	6·8	2·9	3·9
24	1·6	1·0	7·4	20·7	26·8	28·5	6·8	2·3	4·8
Mean ..	1·6	1·9	10·0	18·4	25·1	28·6	9·0	2·5	2·8

TABLE XXIII.

Percentage Frequency of Wind Direction: August.

(1901-1920.)

Hour.	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Calm.
1	1·6	1·3	7·7	19·9	28·0	23·8	7·7	2·6	7·4
2	1·6	1·6	7·1	18·7	25·8	25·5	7·7	2·3	9·7
3	1·9	1·9	7·1	18·7	23·9	24·5	8·0	2·3	11·6
4	2·3	1·6	8·7	19·9	23·2	25·4	8·4	2·3	8·4
5	2·3	2·3	8·7	19·3	22·5	25·1	8·0	2·3	9·6
6	2·3	2·3	10·3	18·0	20·6	24·4	8·7	2·3	11·3
7	1·9	2·3	11·3	19·8	21·1	24·3	8·4	3·3	8·8
8	2·3	2·9	14·5	20·7	20·0	23·9	9·7	3·2	2·9
9	1·9	3·2	15·9	21·7	17·5	25·9	9·1	3·6	1·3
10	2·3	3·8	16·1	20·3	16·7	27·3	10·3	2·9	0·3
11	1·9	2·9	16·8	19·7	17·1	27·1	10·0	4·2	0·3
12	2·3	2·9	18·1	16·8	18·4	28·1	9·0	4·2	0·3
13	2·3	3·2	15·2	17·5	20·4	28·1	8·7	4·2	0·3
14	2·6	2·3	14·8	19·3	20·9	26·1	9·7	3·9	0·7
15	2·3	2·6	13·9	20·7	24·3	23·6	7·8	4·2	0·6
16	2·9	2·3	11·3	22·0	27·5	23·6	7·4	2·6	0·3
17	3·5	2·2	9·9	21·5	30·1	22·1	6·7	2·2	1·6
18	2·9	1·9	8·7	20·9	31·2	23·2	6·1	2·3	2·9
19	2·9	1·9	6·8	20·3	30·0	23·9	6·8	1·9	5·5
20	2·6	1·0	6·1	21·3	29·7	23·5	7·4	1·9	6·5
21	2·3	1·0	6·5	21·0	29·5	23·6	7·8	1·9	6·5
22	1·6	1·0	6·8	20·8	30·2	23·1	7·5	1·9	7·1
23	1·9	1·3	6·8	20·1	29·1	22·0	7·4	2·6	8·7
24	2·3	1·3	6·4	19·6	28·6	22·5	7·7	2·3	9·3
Mean ..	2·2	2·1	10·6	19·9	24·4	24·6	8·2	2·8	5·1

TABLE XXIV.

Percentage Frequency of Wind Direction: September.

(1901–1920.)

Hour.	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Calm.
1	3·7	3·0	8·3	17·3	22·0	19·0	7·7	3·3	15·7
2	3·3	3·3	8·7	17·7	22·4	19·7	7·0	3·3	14·4
3	3·7	3·3	8·3	17·0	21·3	20·0	7·3	3·3	15·7
4	5·0	3·0	9·4	16·4	20·1	20·9	7·4	3·3	14·4
5	5·0	3·7	10·3	15·9	18·9	20·6	6·3	3·0	16·3
6	5·3	3·7	11·0	16·3	17·7	19·0	7·0	3·0	17·0
7	5·3	3·7	12·0	16·6	18·9	19·6	8·0	3·7	12·3
8	5·7	3·7	13·0	18·3	18·3	23·0	9·7	5·0	3·3
9	5·3	3·7	14·3	19·7	15·7	24·7	11·3	5·0	0·3
10	5·7	4·7	15·9	17·3	15·3	23·6	12·3	5·0	0·3
11	4·7	4·0	18·3	16·7	15·0	23·3	11·7	6·3	0·0
12	5·0	4·3	17·3	17·9	14·3	22·9	11·0	7·0	0·3
13	4·4	3·7	16·8	18·5	17·5	22·2	10·4	6·4	0·4
14	5·3	4·3	15·6	18·3	17·9	21·6	10·6	6·0	0·3
15	6·0	5·0	14·3	18·9	19·6	19·6	10·0	6·0	0·7
16	5·3	4·3	11·7	19·0	22·7	20·3	9·7	5·3	1·7
17	5·3	4·0	10·3	20·9	21·3	20·9	8·6	6·0	2·7
18	5·4	3·7	9·1	18·8	23·2	20·5	8·4	6·1	5·2
19	4·4	3·0	7·7	17·1	21·2	21·5	7·7	5·4	12·1
20	4·3	2·6	7·7	18·3	21·3	20·9	8·3	5·0	11·6
21	3·7	3·0	7·7	19·3	22·0	19·7	7·7	5·3	11·7
22	4·3	2·7	7·9	19·9	23·2	19·6	8·3	4·7	9·6
23	3·7	3·0	8·0	19·0	22·0	19·3	8·0	4·0	13·0
24	4·3	3·0	7·3	17·3	22·3	19·6	8·0	4·0	14·3
Mean ..	4·8	3·6	11·3	18·0	19·8	20·9	8·9	4·8	8·1

TABLE XXV.

Percentage Frequency of Wind Direction: October.

(1901–1920.)

Hour.	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Calm.
1	14·5	4·5	7·4	9·4	7·1	11·3	8·7	10·0	27·1
2	14·6	4·9	8·1	8·8	6·2	10·4	9·1	11·1	26·9
3	14·4	4·2	7·4	9·6	7·1	10·9	9·3	10·0	27·2
4	15·9	3·6	8·1	9·4	6·5	10·7	9·1	11·3	25·6
5	15·8	3·9	8·7	9·7	6·8	10·0	8·7	11·6	24·8
6	17·3	4·2	9·3	9·0	6·7	10·6	7·4	9·9	25·6
7	16·5	5·2	9·4	10·0	6·8	11·0	8·7	10·0	22·6
8	19·0	5·5	11·3	12·6	6·4	12·3	10·7	12·6	9·7
9	19·1	6·8	13·6	11·3	6·5	12·6	13·6	13·6	2·9
10	19·3	8·0	13·5	11·3	6·4	13·8	13·2	13·5	1·0
11	18·3	7·4	15·8	10·3	4·8	15·1	13·2	13·5	1·6
12	17·0	9·0	16·4	8·4	5·5	16·4	12·6	13·2	1·6
13	18 3	8·0	14·8	9·0	5·8	15·5	11·9	15·8	1·0
14	18·4	7·1	13·2	10·7	7·4	14·2	11·0	17·4	0·6
15	20·0	6·1	11·9	11·0	7·4	14·5	12·3	15·8	1·0
16	21·9	5·8	11·9	11·3	7·4	13·2	11·3	15·5	1·6
17	23·1	4·9	10·4	11·1	7·8	13·7	10·7	14·3	4·2
18	19·7	4·8	10·0	10·7	7·7	12·6	9·4	11·3	13·9
19	16·8	3·6	8·7	10·0	7·8	11·3	8·1	9·1	24·6
20	15·2	3·6	10·4	11·3	7·5	11·3	7·5	9·4	23·9
21	14·6	3·6	9·1	11·4	7·5	11·4	8·1	10·1	24·4
22	14·9	3·9	9·4	11·0	7·8	10·7	9·1	9·4	23·9
23	14·6	4·2	8·7	10·4	7·1	10·7	9·1	9·7	25·6
24	14·2	3·5	7·4	10·0	7·1	10·7	8·7	10·3	28·1
Mean ..	17·2	5·3	10·6	10·3	6·9	12·3	10·1	12·0	15·4

TABLE XXVI.

Percentage Frequency of Wind Direction: November.

(1901–1920.)

Hour.	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Calm.
1	38·7	7·7	5·3	2·3	1·3	3·0	4·3	9·7	27·7
2	41·3	7·3	5·0	2·7	1·3	2·0	4·3	11·0	25·0
3	41·3	8·7	5·0	2·4	1·0	2·4	4·4	12·8	22·0
4	44·1	8·4	4·1	2·7	1·0	2·4	3·7	11·8	22·0
5	44·8	10·1	4·7	2·4	1·0	3·0	4·1	12·1	17·8
6	43·8	11·1	5·0	1·7	1·0	2·7	4·0	12·4	18·4
7	42·8	10·4	4·7	2·4	0·7	3·4	4·0	11·4	20·0
8	47·0	11·0	5·0	2·3	1·0	3·7	4·7	13·7	11·7
9	48·5	13·7	5·4	2·4	1·0	3·7	5·7	16·4	3·3
10	45·5	17·4	8·0	2·0	1·0	4·4	6·4	14·4	1·0
11	44·3	17·0	10·0	1·7	1·3	5·0	6·0	14·3	0·3
12	45·2	13·7	10·4	1·7	1·0	5·0	5·7	17·1	0·4
13	44·8	10·4	8·4	2·4	1·0	5·0	6·7	21·1	0·4
14	46·2	8·7	7·0	2·4	1·0	5·0	6·4	23·1	0·4
15	47·0	7·0	6·3	2·3	0·7	5·0	8·0	22·7	1·0
16	48·9	7·7	5·0	2·3	1·0	4·3	8·3	20·3	2·3
17	50·5	7·7	4·7	2·7	1·0	4·0	5·4	17·7	6·4
18	44·7	7·3	4·7	2·7	0·7	3·7	3·7	11·0	21·7
19	37·0	6·7	4·7	3·0	1·0	3·7	3·3	7·7	31·7
20	36·5	5·7	5·0	1·7	1·0	4·4	3·0	7·7	35·1
21	36·8	6·7	5·0	2·0	1·0	4·4	4·4	8·7	31·1
22	35·9	7·0	4·0	2·3	1·0	4·3	4·0	8·3	33·2
23	37·3	6·7	5·7	2·7	1·0	3·7	4·7	9·0	29·3
24	38·2	7·0	5·0	2·7	1·0	3·0	5·0	10·0	28·2
Mean ..	43·0	9·4	5·8	2·3	1·0	3·8	5·0	13·5	16·3

TABLE XXVII.

Percentage Frequency of Wind Direction: December.

(1901–1920.)

Hour.	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Calm.
1	43·3	5·3	1·0	0·3	0·7	2·3	2·9	16·7	27·5
2	47·5	4·9	1·0	0·3	0·3	2·0	3·6	19·4	21·0
3	49·9	5·6	1·0	0·3	0·3	1·6	3·6	18·0	19·7
4	49·5	6·6	1·3	0·3	0·7	1·6	2·9	20·7	16·3
5	52·6	5·2	1·0	0·3	0·3	2·3	2·9	18·0	17·4
6	51·8	6·9	1·3	0·3	0·3	1·3	2·3	18·7	17·0
7	52·0	6·2	1·6	0·3	0·3	1·6	2·9	17·0	18·0
8	53·0	7·5	1·6	0·3	0·0	1·6	2·9	18·0	15·1
9	58·2	8·9	1·6	0·3	0·3	2·0	3·0	20·1	5·6
10	58·2	11·5	2·6	0·3	0·3	2·3	3·6	19·4	1·6
11	55·8	12·8	4·3	0·3	0·7	2·6	3·3	18·7	1·6
12	54·0	10·9	3·6	0·7	1·0	3·0	4·3	22·7	0·0
13	53·8	7·5	2·3	0·7	0·7	2·9	6·8	25·1	0·4
14	51·3	5·5	2·3	0·7	1·0	2·9	7·2	29·1	0·0
15	51·5	5·6	2·0	0·3	0·7	2·3	7·5	29·9	0·3
16	54·3	4·6	1·7	0·3	0·7	2·0	6·6	29·3	0·7
17	58·6	4·6	1·3	0·3	0·3	1·7	5·3	24·4	3·6
18	49·4	4·3	1·0	0·3	0·3	1·6	3·6	17·7	21·9
19	38·5	3·6	1·0	0·3	0·3	1·7	3·0	13·8	37·8
20	36·2	4·3	0·7	0·3	0·3	1·7	3·6	13·2	39·8
21	36·3	3·9	1·0	0·3	0·3	1·6	2·9	12·8	40·8
22	36·9	3·9	1·0	0·3	0·7	1·6	3·6	13·7	38·2
23	39·6	4·3	1·3	0·3	0·7	1·3	2·9	14·1	35·6
24	42·8	4·3	1·3	0·3	0·7	2·0	2·9	16·0	29·7
Mean ..	49·0	6·2	1·6	0·3	0·5	2·0	3·9	19·4	17·1

TABLE XXVIII.

Normals of Upper Air Winds.

(Alipore and Diamond Harbour Combined.)

Height above sea=0·01 Km.

Height in Kms. above sea.	January.					February.					March.				
	N.	Vm.	Vr.	Dn.	No. of years.	N.	Vm.	Vr.	Dn.	No. of years	N.	Vm.	Vr.	Dn.	No. of years.
0·2	116	5·0	2·6	25	4	111	5·9	1·6	307	4	122	6·7	4·3	240	4
0·5	142	5·1	3·6	354	5	125	5·9	2·7	308	5	140	6·5	3·7	255	5
1·0	141	5·0	3·8	329	5	121	5· 9	4·2	299	5	139	5·7	3·6	270	5
1·5	135	6·6	5·5	309	5	118	7·5	6·5	297	5	135	5·9	4·4	286	5
2·0	124	8·3	7·0	304	5	113	10·3	9·3	295	5	129	7·0	5·8	292	5
2·5	116	10·2	8·8	296	5	96	12·5	11·4	295	5	119	8·4	7·4	295	5
3·0	101	11·1	9·8	287	5	85	14·0	13·0	293	5	115	9·6	8·8	297	5
3·5	84	12·2	11·2	282	5	73	14·5	13·5	291	4	101	10·4	9·6	297	5
4·0	73	13·1	11·9	274	5	65	15·3	14·3	290	4	96	10·9	10·0	295	4
4·5	58	14·0	13·1	271	5	55	17·3	16·5	286	4	87	11·6	10·5	290	4
5·0	53	15·6	14·5	271	5	43	18·6	17·5	280	4	81	12·1	11·0	290	4
6·0	34	18·8	17·9	267	4	28	21·1	20·5	275	4	68	14·2	13·1	280	4
7·0	12	21·5	20·0	262	4	11	24·3	23·0	267	2	42	15·7	14·4	277	4
8 0	4	22·7	20·9	262	3	3	23·8	23·5	279	2	17	18·3	16·9	274	4
9·0	..	..	..	..	..	..	..	..	..	..	4	14·6	14·3	245	2
10·0	..	..	..	..	..	..	..	..	..	..	2	8·5	8·5	256	1
11·0	..	..	..	..	..	..	..	..	..	..	1	21·0	21·0	240	1

N=Number of observations.

Vm=Mean velocity irrespective of direction (arithmetical mean).

Vr=Mean resultant velocity (geometrical mean).

Dn=Resultant direction.

Velocity in metres per second.

TABLE XXIX.

Normals of Upper Air Winds.

(Alipore and Diamond Harbour Combined.)

Height above sea=0·01 Km.

Height in Kms. above sea.	April.					May.					June.				
	N.	Vm.	V r.	Dn.	No. of years.	N.	Vm.	Vr.	Dn.	No. of years.	N.	Vm.	Vr.	Dn.	No. of years.
0·2	118	8·3	7·2	206	4	121	7·7	6·8	205	4	124	8·3	6·6	194	4
0·5	163	8·7	6·7	217	6	183	8·6	7·4	211	7	185	8·1	6·6	214	7
1·0	149	7·8	5·2	242	6	168	7·2	5·6	228	7	158	7·5	5·2	231	7
1·5	132	7·2	5·0	263	6	149	6·0	4·0	255	7	130	6·5	3·5	258	7
2·0	112	6·9	5·4	276	6	134	5·7	3·6	281	7	102	6·4	3·1	279	7
2·5	99	7·8	6·7	287	6	119	6·3	4·3	305	7	82	6·3	2·9	303	7
3·0	88	9·1	8·1	290	6	109	7·6	5·7	313	7	73	6·8	4·0	319	7
3·5	79	10·5	9·5	295	6	102	8·8	7·2	315	7	57	7·2	4·4	333	7
4·0	69	12·0	11·1	298	6	90	10·0	8·4	313	7	43	6·9	3·7	340	6
4·5	65	13·1	12·1	299	6	76	9·4	7·5	307	7	39	6·1	2·7	357	6
5·0	55	12·7	11·7	296	5	71	8·9	6·6	295	6	35	5·8	1·7	11	6
6·0	44	12·9	11·7	287	5	56	8·4	5·8	280	5	22	5·8	2·9	102	4
7·0	22	14·2	13·3	284	5	41	9·0	6·0	288	5	15	5·7	2·8	125	4
8·0	14	15·2	13·8	275	4	30	9·1	5·4	265	5	9	6·7	3·2	132	4
9·0	8	14·9	13·9	278	3	23	10·3	6·5	261	4	7	7·2	5·1	98	4
10·0	3	9·2	6·2	299	2	13	8·9	6·6	249	4	6	7·9	3·3	114	3
11·0	2	12·5	8·3	270	2	10	9·7	6·2	254	4	4	9·4	6·9	172	3
12·0	1	6·0	6·0	300	1	4	11·5	11·2	251	3	3	8·8	8·2	193	2
13·0	1	7·0	7·0	320	1	4	11·7	11·5	242	3	1	4·0	4·0	195	1
14·0	..	..	..	..	..	1	9·0	9·0	235	1	..	..	..	..	..

N=Number of observations
Vm=Mean velocity irrespective of direction (arithmetical mean).
Vr=Mean resultant velocity (geometrical mean).
Dn=Resultant direction.
Velocity in metres per second.

TABLE XXX.

NORMALS OF UPPER AIR WINDS.

(Alipore and Diamond Harbour Combined.)

Height above sea=0·01 Km.

Height in Kms. above sea.	JULY.					AUGUST.					SEPTEMBER.				
	N.	Vm.	Vr.	Dn.	No. of years.	N.	Vm.	Vr.	Dn.	No. of years.	N.	Vm.	Vr.	Dn.	No. of years.
0·2	107	7·5	4·5	199	4	84	5·9	2·8	178	3	87	5·7	3·5	189	3
0·5	167	7·6	4·6	210	7	166	6·7	3·1	215	7	156	6·2	3·0	178	6
1·0	140	7·5	4·5	221	7	141	6·1	2·4	215	7	147	6·0	2·5	173	6
1·5	103	7·0	4·2	218	7	117	5·6	2·3	216	7	130	5·6	2·0	172	6
2·0	78	6·6	3·8	223	7	85	5·5	2·3	210	7	114	5·3	1·7	159	6
2·5	58	6·5	3·3	226	7	68	5·2	2·1	181	7	99	5·2	1·7	151	6
3·0	46	5·5	1·8	197	6	60	4·9	2·0	160	7	89	5·2	1·7	159	6
3·5	36	5·3	2·3	192	6	51	5·0	2·5	142	7	79	5·4	1·9	170	6
4·0	32	5·2	2·1	193	5	42	4·9	2·4	146	6	73	5·6	2·1	179	6
4·5	28	4·5	2·1	194	5	37	4·9	2·5	143	6	65	5·3	2·1	160	6
5·0	25	4·1	2·0	170	5	33	5·3	3·3	141	6	62	5·3	2·2	156	6
6·0	18	5·3	3·2	147	5	27	4·9	3·7	134	5	47	5·0	1·7	151	5
7·0	9	5·2	4·5	119	4	17	6·0	5·1	116	5	37	5·2	2·3	129	5
8·0	9	7·6	7·4	111	5	10	7·5	6·9	110	5	31	5·7	2·3	131	5
9·0	7	10·8	10·6	100	4	9	9·7	9·1	102	4	17	5·0	1·5	120	5
10·0	3	15·7	15·4	97	3	6	10·2	10·1	100	3	15	7·1	3·6	147	5
11·0	1	16·0	16·0	90	1	2	13·5	13·1	93	2	10	6·1	1·9	139	4
12·0	1	16·0	16·0	95	1	1	14·0	14·0	90	1	6	7·0	5·0	138	4
13·0	..	..	..	..	..	1	18·0	18·0	70	1	6	7·3	5·4	124	4
14·0	..	..	..	..	..	..	..	..	..	..	4	9·7	9·1	97	3
15·0	..	..	..	..	..	..	..	..	..	..	2	16·3	15·9	104	1
16·0	..	..	..	..	..	..	..	..	..	..	1	20·0	20·0	85	1

N=Number of observations.

Vm=Mean velocity irrespective of direction (arithmetical mean).

Vr=Mean resultant velocity (geometrical mean).

Dn=Resultant direction.

Velocity in metres per second.

TABLE XXXI.

NORMALS OF UPPER AIR WINDS.

(Alipore and Diamond Harbour Combined.)

Height above sea=0·01 Km.

Height in Kms. above sea.	OCTOBER.					NOVEMBER.					DECEMBER.				
	N.	Vm.	Vr.	Dn.	No. of years.	N.	Vm.	Vr.	Dn.	No. of years.	N.	Vm.	Vr.	Dn.	No. of years.
0·2	87	4·6	1·2	22	3	85	6·3	5·3	18	3	90	6·5	5·9	18	3
0·5	165	4·5	1·2	5	6	166	5·8	4·9	21	6	179	4·9	4·0	9	6
1·0	163	4·5	1·8	1	6	167	5·2	4·1	6	6	180	5·1	4·1	346	6
1·5	161	4·9	2·2	347	6	157	5·0	3·6	349	6	173	5·9	4·5	332	6
2·0	153	5·2	1·8	318	6	146	5·3	3·0	311	6	163	6·6	5·1	319	6
2·5	142	5·3	2·3	281	6	135	5·8	3·6	287	6	152	8·0	6·5	308	6
3·0	134	5·9	3·5	264	6	129	6·7	4·9	281	6	142	8·9	7·5	297	6
3·5	125	6·8	4·5	257	6	118	7·7	6·5	277	6	128	9·9	8·5	290	6
4·0	116	7·5	5·1	256	6	110	8·8	7·7	277	6	122	11·1	9·9	285	6
4·5	110	8·0	5·7	259	6	105	9·9	8·9	275	5	117	12·7	11·5	281	6
5·0	100	8·3	6·3	262	6	101	11·3	10·2	274	5	111	14·3	13·0	280	6
6·0	86	9·2	7·2	266	6	92	13·6	12·7	274	5	82	16·0	14·7	274	6
7·0	61	10·0	8·1	265	6	67	16·1	15·0	273	5	44	17·8	16·3	272	5
8·0	35	11·8	9·2	258	6	28	15·6	14·6	277	5	15	19·5	17·3	270	5
9·0	23	11·5	7·9	252	5	12	15·2	14·7	273	5	4	15·0	11·5	301	4
10·0	10	10·3	7·8	263	4	3	17·5	17·2	269	3	2	8·5	6·5	332	2
11·0	5	10·3	7·6	234	4	1	18·0	18·0	250	1	2	10·3	6·3	303	2
12·0	2	12·5	6·7	223	2										

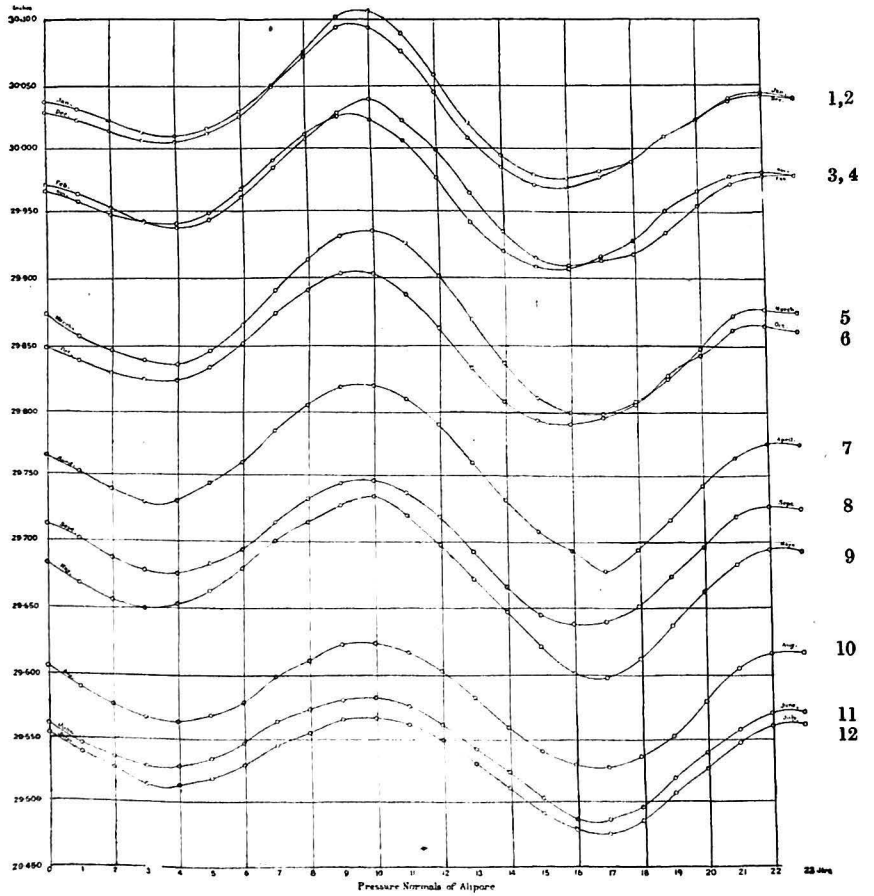
N=Number of observations.

Vm=Mean velocity irrespective of direction (arithmetical mean).

Vr=Mean resultant velocity (geometrical mean).

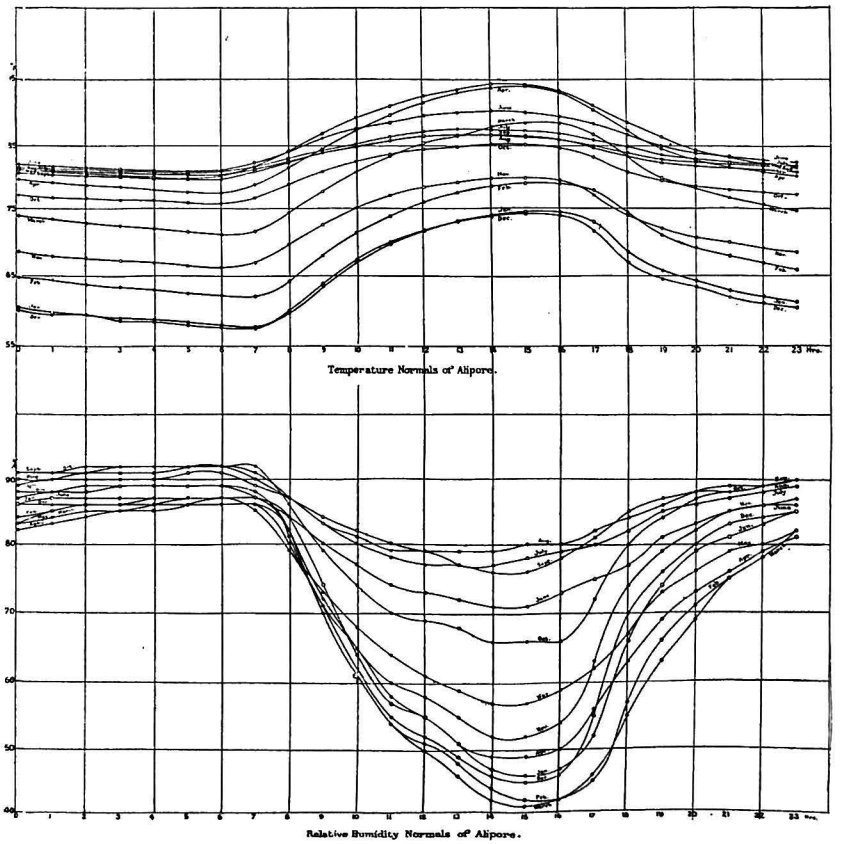
Dn=Resultant direction.

Velocity in metres per second.



1=January	4=February	7=April	10=August
2=December	5=March	8=September	11=June
3=November	6=October	9=May	12=July

FIG. 2.—PRESSURE NORMALS OF ALIPORE.

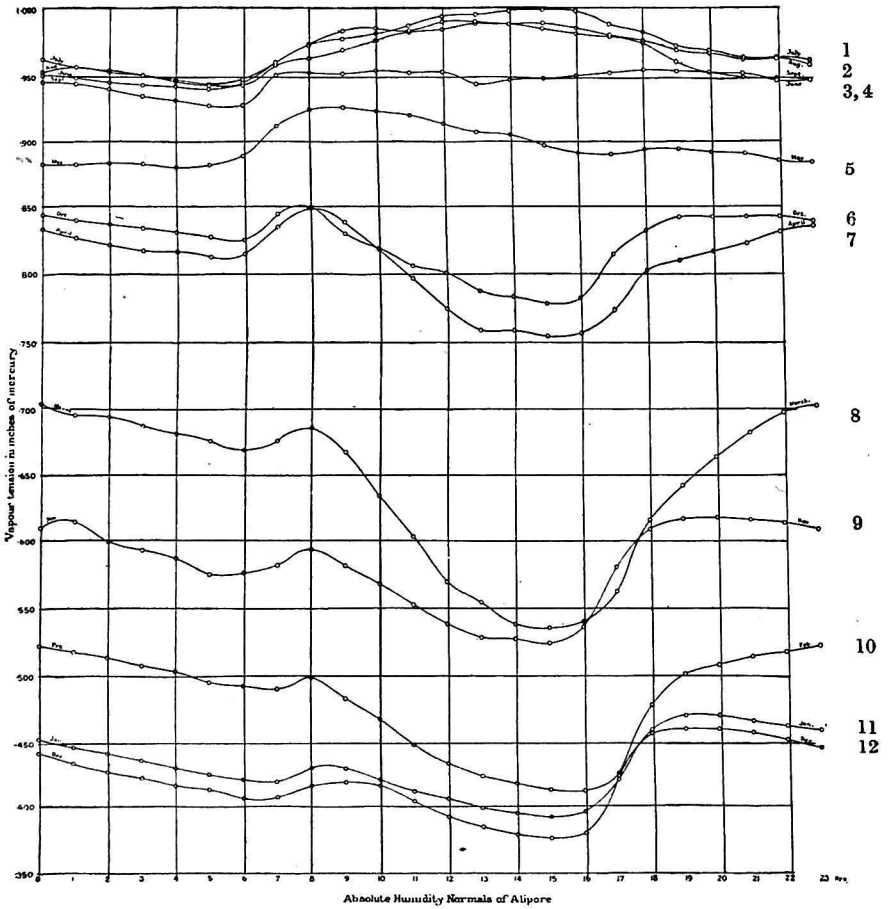


1=June	4=August	7=October	10=February
2=July	5=September	8=March	11=January
3=May	6=April	9=November	12=December

TEMPERATURE NORMALS OF ALIPORE.

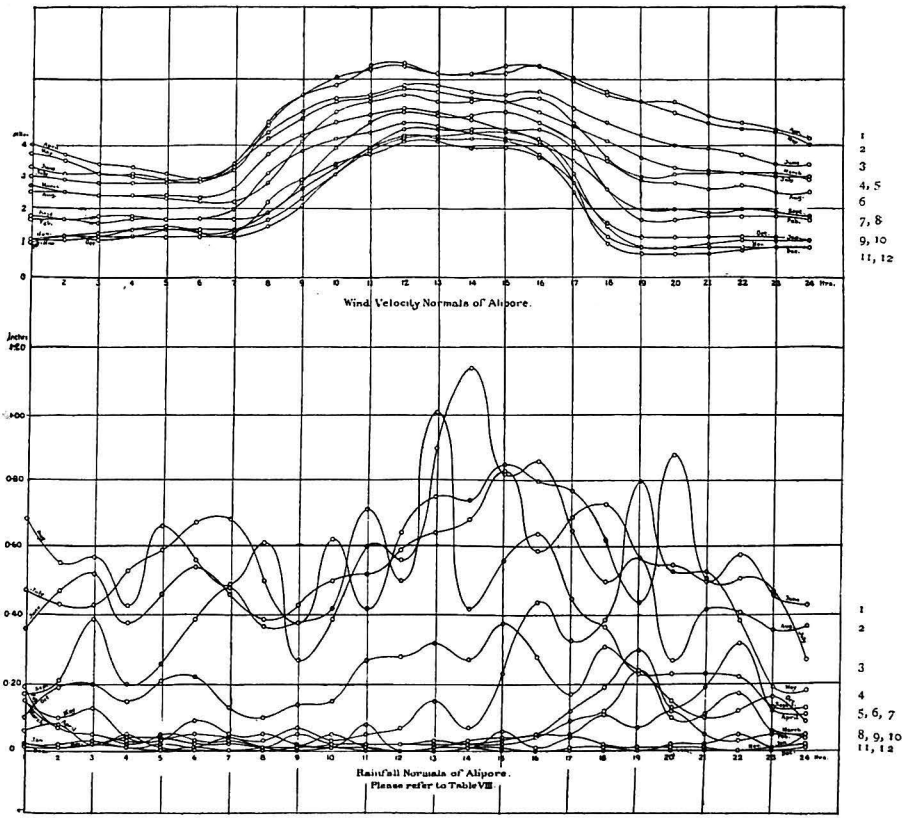
1=September	4=July	7=December	10=March
2=October	5=November	8=January	11=February
3=August	6=June	9=May	12=April

FIG. 3.—RELATIVE HUMIDITY NORMALS OF ALIPORE.



1=July	4=June	7=April	10=February
2=August	5=May	8=March	11=January
3=September	6=October	9=November	12=December

FIG. 4.—ABSOLUTE HUMIDITY NORMALS OF ALIPORE.

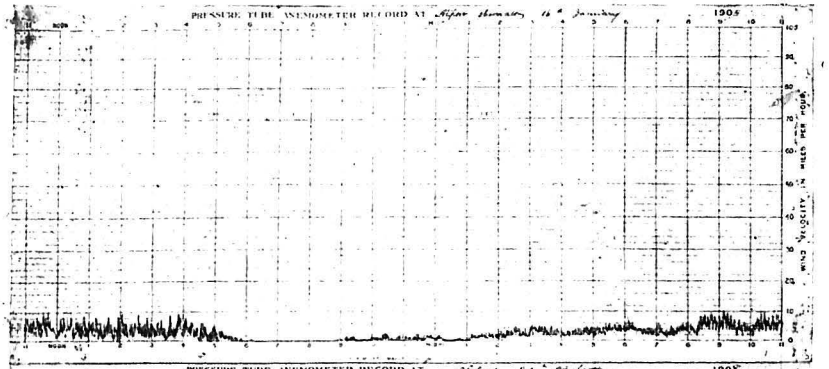


1=April	4=July	7=September	10=January
2=May	5=March	8=February	11=November
3=June	6=August	9=October	12=December

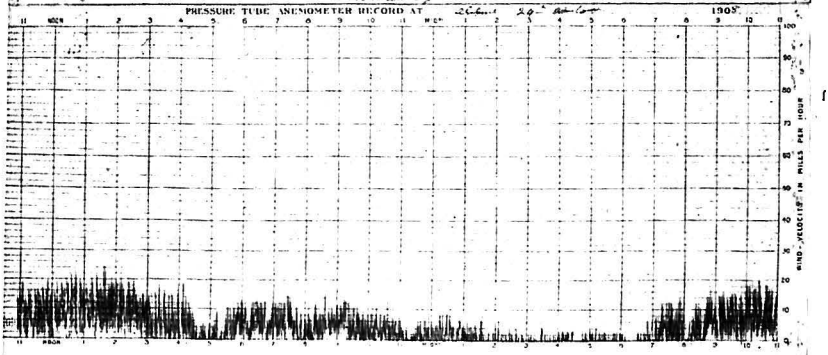
WIND VELOCITY NORMALS OF ALIPORE.

1=June	4=May	7=October	10=February
2=August	5=September	8=March	11=November
3=July	6=April	9=January	12=December

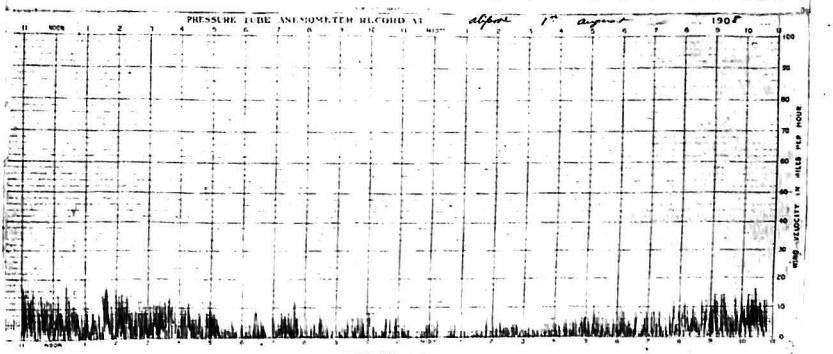
FIG. 5.—RAINFALL NORMALS OF ALIPORE.



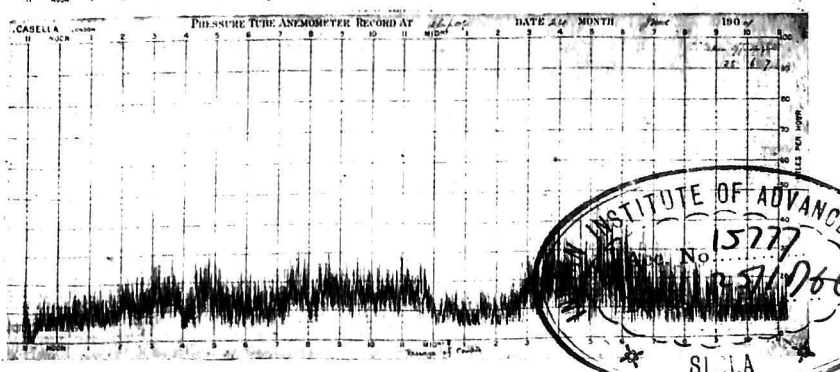
Winter



Hot weather



Monsoon



Storm

Typical Anemograms of Alipore.