

INTRODUCTION

With the increased tempo of U.S. Navy operations in the Indian Ocean, there has been a matching increase in concern over the environmental support available to the Fleet meteorologists. As part of the NAVENVPREDRSCHFAC effort to improve that support, this Command has reprinted a series of meteorological handbooks -- collectively titled Weather In The Indian Ocean -- that were originally issued by the British Government in the 1940-44 time frame.

These handbooks, published as three volumes in a total of twelve parts, were prepared by the Meteorological Office, Air Ministry, in cooperation with the Naval Meteorological Branch, Admiralty, London. Titles of all volumes/parts in the series are given below.

Because the series has long been out of print, the NAVENVPREDRSCHFAC has obtained permission to reprint and distribute the handbooks to U.S. Navy units. As in the original publication, this new reprinting ultimately will comprise twelve individual books, each marked with volume and part number; the reprint set is distributed as NAVENVPREDRSCHFAC Technical Bulletin 80-02, April 1980. The books are three-hole-punched for collection into ring binders. There has been no editing or changing of the original material.

Users of the series should be alert to the fact that a number of place names used in the original writing have changed over the intervening years.

Volumes/parts titles in the series are as follows:

- Vol. I ---- Weather In The Indian Ocean - General Information (in one part)
- Vol. II --- Weather In The Indian Ocean to Latitude 30⁰S and Longitude 95⁰E including the Red Sea and Persian Gulf (in nine parts; see parts titles below)
- Vol. III -- Weather In The Indian Ocean - Aids To Forecasting (in two parts:
1, Indian Ocean; and 2, North Indian Ocean)

Parts titles, Volume II (local information):

1. Red Sea
2. The Gulf of Aden and West Arabian Sea to Longitude 00⁰E
3. The Persian Gulf and Gulf of Oman
4. The Makran Coast from Gwadar to Karachi and the West Coast of India to Latitude 20⁰N
5. West Coast of India from Latitude 20⁰N to Cape Comorin, with an Appendix on Conditions at Bombay
6. A. East Coast of India from Cape Comorin to the Ganges Delta -- B. Ceylon
7. The Coast of Burma
8. The South Indian Ocean to Latitude 30⁰S.
9. Coast of East Africa from the Equator to Cape Delgado



PART 8
 THE SOUTH INDIAN OCEAN
 TO LATITUDE 30° S.

Frontispiece]

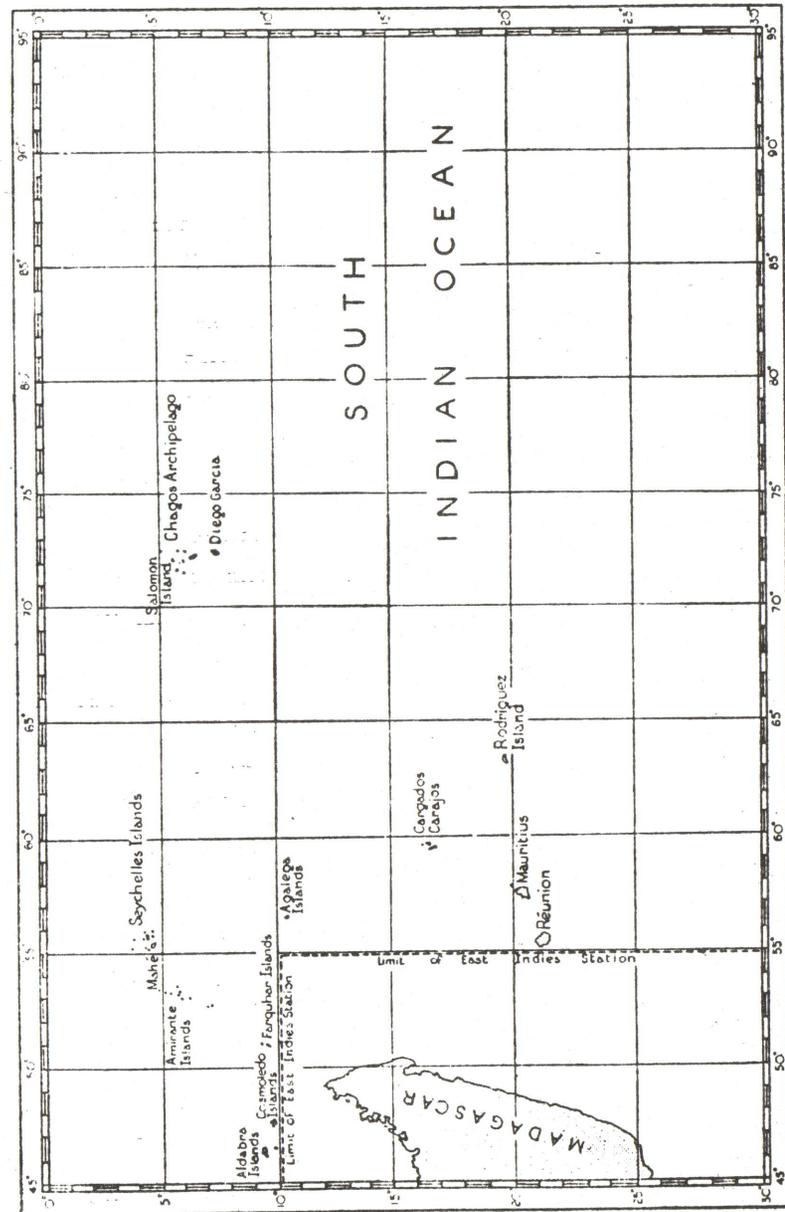


FIG. 1.—THE SOUTH INDIAN OCEAN TO LATITUDE 30° S. AND BETWEEN LONGITUDES 45° AND 95° E.

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as long as a week. The observatory, the position of which is marked on the contour map, is at Hellbourg, about 3,000 feet above mean sea level; the observations therefore at the observatory, owing to its height, will differ from those obtained at sea level and this should be borne in mind when consulting the general climatological table on page 65.

The island of Rodriguez lies about 320 miles eastward of Mauritius and is of volcanic formation; it is surrounded by coral reefs except for a few hundred yards at the south-eastern end. The island is elliptical in form and hilly throughout with but little level land, the central ridge being 1,300 feet high at its highest point. The area of the island is about 42 square miles and it is a little over 9 miles long from east to west and a little less than $4\frac{1}{2}$ miles in breadth from north to south. The observatory is 140 feet above mean sea level and is situated on the northern shore near Port Mathurin, the principal port and capital of the island.

The Seychelles islands, which extend between the parallels $3^{\circ} 40'$ and $6^{\circ} 05'$ S. and between the meridians $53^{\circ} 57'$ and $57^{\circ} 10'$ E., comprise some 29 islands and islets, the smaller of coral and the larger of granite formation. The bigger islands are high and volcanic, and the principal island is Mahé which is about 17 miles long from north to south and 4 to 7 miles broad from east to west, rising in one part to nearly 3,000 feet. The observatory is on this island and is situated at the head of a long pier close to the harbour of the principal town of Victoria.

The Chagos archipelago, which lies between the parallels $4^{\circ} 44'$ and $7^{\circ} 39'$ S. and the meridians $70^{\circ} 50'$ and $72^{\circ} 44'$ E., consists of several coral reefs and small islands of the atoll type; Diego Garcia is the principal and southernmost island of the group and on this island there is an observatory. Earthquake shocks are felt in this archipelago occasionally.

As the area under consideration is in the southern hemisphere the seasons of the year are reversed and the spring is in October and November, the summer from December to March, the autumn in April and May, and the winter from June to September.

A characteristic feature of the region is the anticyclonic belt which forms part of the general high pressure belt stretching around the globe between about latitudes 18° and 40° S. Over the South Indian ocean this belt consists of a succession of anticyclonic systems of varying intensity which traverse the ocean from west to east throughout the year; the interval between successive high pressures varies, but they appear to follow each other, about every 20 days. Separating these travelling high pressure systems there are well-marked low pressure systems, generally in the form of V-shaped depressions, and during the cyclone season (December to May) tropical low pressure systems from the equatorial regions may also sometimes penetrate this belt and disturb the general conditions.

Tropical cyclones are occasionally experienced in the area under consideration and they are most likely to be encountered to the west of the meridian 70° E. but not usually north of the parallel 6° S. They are most frequent from December to March, which are the summer months in the southern hemisphere.

The climate of the area under consideration is chiefly dominated by the SE. trade which blows throughout the year, but there are variations in its steadiness and extent. North of Lat. 10° S. the NW. or cross monsoon prevails from November to March with the SE. trade extending north of Lat. 10° S. from about April to September when it is continuous with the SW. monsoon of the northern hemisphere. All the islands included in this part come under the influence of the SE. trade, but those to the north of Lat. 10° S. experience the NW. or cross monsoon winds during the summer, whilst the islands of Mauritius, Réunion and Rodriguez are within the zone of the SE. trades throughout the year.

The weather at these islands, therefore, differs on the south and east coasts from that on the north and west coasts, so it is important to know the position of the observatory, where the majority of the observations are taken. For the islands of Mauritius and Réunion this is indicated on the contour maps given in Figs. 2 and 3 on pages 5 and 6.

At Mauritius the north-western and western side of the island will be found to be usually more sheltered than the south and east coasts where the prevailing winds first strike the island. At Réunion also the SE. trade strikes the south-east coast first, where the high mountains behind this coast-line divide the current of air, causing one branch to pass up the coast as far as Saint Denis where it passes away from the land to the north-westward, whilst the other branch follows the south-western or lee coast as far as about Pointe des Aigrettes before turning off to seaward. The result of this is that from Pointe des Aigrettes to Cap Bernard, including the Baie de Saint Paul and Port des Galets, only light eddy breezes prevail during the SE. trade season (April to November) and that coast is the most sheltered during these months. During the cyclone season (November to March), cyclones coming from the eastward strike the coast in the neighbourhood of Sainte Rose, and so Pointe des Galets receives the shock of these cyclones under the most favourable circumstances, and if that point is within the limits of the dangerous semi-circle the wind can only reach it after passing the natural screen formed by the high mountains of the interior. It will, therefore, be seen that the north-western coast of the island is the most sheltered during the whole year.

The visibility throughout the region on the whole is good except during rainstorms, and fog or mist is usually only experienced in the more elevated parts of the islands, which at times may be enveloped in cloud. The rainy season in the area is from about December to

April, which are the summer months, and the remainder of the year is comparatively dry but this will vary slightly in the different localities. In the Chagos archipelago the dry season is usually from about June to September, but the wet and dry seasons here have been known to be occasionally reversed and in some years instead of the NW. monsoon bringing the rain the SE. trade has brought it.

No great extremes of temperature are experienced anywhere in the region as the area under consideration is entirely oceanic with numerous small islands and with no large land area in the vicinity. The highest mean temperature over the sea between the equator and Lat. 10° S. does not exceed 82° F. in the summer and the lowest between latitudes 20° and 30° S. in the winter is 64° F. At the islands the highest temperatures are not likely to exceed 95° F. in the summer or to drop below 50° or 55° F. in the winter at sea level, but lower temperatures are experienced at higher altitudes.

Summary of local weather conditions at Mauritius

The two main types of weather commonly experienced at Mauritius are described here. These types of weather are usually preceded or followed by intermediate transitory conditions.

With the first type of weather the island is entirely under the influence of an intense southern or south-eastern anticyclonic system. The SE. trade conditions then prevail and this, with minor differences, is the regular and semi-permanent state of the weather at Mauritius. It is most intense in winter (June to September), as the great belt of the SE. trade then penetrates furthest northwards to the equator and Mauritius remains constantly under the influence of this cool trade wind of polar origin.

When the SE. trade wind, which is cold and dry, has been established for a certain length of time, very pleasant, clear, cool and agreeable weather is experienced during which a warm sun shines from a wholly blue or only lightly veiled sky, over which there is a thin layer of cirrostratus. Occasionally in the late afternoon and evening the sky which is still clear and blue will show here and there some delicate filaments of threadlike cirrus mixed with a thin veil of cirrostratus. This type of weather is the most agreeable that can be experienced at Mauritius and by the pleasant invigorating feeling it causes it resembles that of the lovelier days of spring in more temperate climates.

The SE. trade is much less dominant in the summer months and when an interruption in it brings about a marked alteration in the comfort and well-being of the inhabitants of the island the change is hardly ever passed without notice or comment. An interruption in the SE. trade occurs at Mauritius when the southern anticyclonic system from which it is fed has for some reason or other withdrawn from this part of the South Indian ocean. The sudden re-establishment of SE. trade conditions after such an interruption is usually in the nature of so rapid an incursion that considerable changes in

pressure, temperature and humidity will take place in a very short time. Whilst the pressure is steadily rising (pressure may occasionally reach 5 mb. above normal) very disturbed weather will prevail. The arrival of the cooler air of polar origin undercutting the warmer equatorial air will cause continuous drizzle and often moderate, continuous rain, the sky will remain overcast with a huge layer of stratocumulus and altocumulus under which there is a current of low fast-moving fractonimbus or nimbostratus. If the wave of high pressure is intense, the trade wind will usually increase in force day by day; over the land it may at times reach Beaufort force 5 or 6, whilst at sea on these occasions force 7 has been reported.

The cool stormy wind and damp air of this type of weather is particularly disagreeable if it occurs in April and May and it may last for two or three days in succession.

In the second type of weather the island is under the influence of a V-shaped depression or a weak tropical depression of equatorial origin situated to the south of Mauritius. The conditions occur principally and quite often in summer (December to March) and occasionally during the months of October, November, April and May, but never in winter (June to September).

The normal SE. trade is often interrupted in these months and calm weather or light variable winds of northerly origin prevail. When these conditions exist high temperatures are recorded but in spite of this and the abnormally intense convection, relative humidity is also excessive and at times may be as much as 10 per cent above the daily average. On such days, "afternoon rain" is locally a well known phenomenon. The day starts with a blue cloudless sky at sunrise and a parching sun. Clouds, however, will soon begin to form over the island and by midday will rapidly grow from ordinary cumulus to heavy cumulus of the "cauliflower" type; later the more turbulent type of cumulus and heavy cumulonimbus will be seen. The deep dark blue aspect of the mountain ridges and of distant vegetation at such times is a very characteristic sign.

Early in the afternoon these clouds often break into a sudden downpour which resembles in some ways other well known "instability showers" of a different origin. These purely convective rains may not always occur, however, as at times the sky may remain heavily clouded and almost overcast with hardly any rain until sunset, at which time the clouds will gradually dissolve until in two or three hours the sky will have once more resumed its cloudless and clear appearance.

There is intense nocturnal radiation at these times so the nights are cool, which is in great contrast to the hot, uncomfortable weather experienced in the day. The highest known maxima and the greatest diurnal variation of temperature in the island have been observed on these occasions, when the incoming warmer air of equatorial origin spreads a heavy cloud "blanket" over the sky.

II—TROPICAL CYCLONES

The tropical revolving storms or cyclones of the South Indian ocean, their origin, formation, size and tracks are dealt with fully in Volume I. It is only proposed in this section to give very briefly the regions and months in which they occur, their frequency and probable tracks.

It has not been found possible to adopt for the tropical cyclones of the South Indian ocean the same rigid definition of what constitutes a "depression," "storm," or "severe storm" as that used by the India Meteorological Department for the North Indian ocean. The reason for this is that it is often impossible to observe many of the cyclones closely owing to their following courses away from land areas; the wind speeds attained by them near their centres are consequently unknown. If a minimum wind speed were specified then all such cyclones would be excluded from the estimated number and this would cause an underestimate of the frequency. In recent years, however, the Royal Alfred Observatory in Mauritius has included in its records accounts of minor disturbances which, as far as can be judged, never had winds that attained hurricane force.

Region of occurrence and frequency.—Cyclones have been reported from all parts of the South Indian ocean within the tropics south of Lat. 6° S. The mean position of origin of these cyclonic storms is given in the following table which has been compiled from an analysis of over 500 storms:—

MEAN POSITION OF ORIGIN OF CYCLONIC STORMS IN THE SOUTH INDIAN OCEAN

	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May
Latitude S.	.. 13·0°	13·8°	13·9°	14·6°	14·4°	13·9°	11·1°
Longitude E.	.. 66·8°	62·8°	61·8°	62·6°	63·0°	66·0°	68·4°

Authority.—Bibliography No. 34.

From the above table it can be seen that on the average the storms form between latitudes 10° and 15° S.; but the formation of storms between latitudes 15° and 20° S. is comparatively frequent and some have even originated south of Lat. 20° S. Although storms rarely occur between the equator and Lat. 5° S., and the Chagos archipelago is only infrequently visited, they have been recorded on several occasions from Cocos island, and some there have been exceptionally severe, notably one that occurred on 27th November, 1909. This island, however, is just outside the eastern limit of the region under consideration here.

In October storms may occur westward of Cocos island and eastward of Rodriguez; in November and December most of the storms originate between Lat. 5° S. and 15° S. and between Madagascar and Long. 70° E. On the other hand they may occur

very far eastward especially in November. In January, February and March comparatively few storms originate eastward of Long. 90° E., the area of maximum occurrence being eastward of Madagascar over the islands of Mauritius, Réunion and Rodriguez. Occasionally storms in December to April penetrate into Madagascar or pass down the Mozambique channel. In April occasional storms may originate very far eastward between longitudes 80° and 90° E.

As there are very few observing stations in the South Indian ocean, especially in the eastern portion where the distance between Cocos island (12° S., 97° E.) and the Chagos archipelago (7° S., 72° E.) is roughly 1,500 miles, it is difficult to make an accurate comparison of the frequency of cyclones in the different parts of the area. Within that part of the Indian ocean, therefore, records of cyclones depend on isolated reports from ships and since the region of strong winds in some storms covers an area only about 40 or 50 miles in diameter it is probable that many storms have passed unrecorded. It would appear, however, to be well-established that cyclones are more frequent in the western part of the South Indian ocean between about Long. 70° E. and the coast of Africa than in the eastern part.

In the whole area dealt with here it is probable that the normal number of storms that occur in the year is about 7 or 8.

At the Royal Alfred Observatory in Mauritius there are fairly complete records of storms, which go back to 1848. The following table gives the total number of storms whose centres have been located passing through the area 0°–30° S., 50°–70° E. in a period of 85 years between 1848 and 1935:—

NUMBER OF CYCLONES RECORDED IN THE AREA 0°–30° S., 50°–70° E. Period: 1848 to 1935* (85 years)

Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Total
1	5	13	50	112	106	70	31	13	401

Authority.—Bibliography No. 24 (No. 19).

**Note.*—No records were available for the years 1849, 1850 and 1854.

This table indicates that there is an average frequency of about 5 cyclones a year in that region; but since it is possible that in the earlier years only the more intense storms were recorded the average may probably be a little higher. The total may vary much from one year to another; in some years there may be several storms but in many years only one has been recorded whilst there were none at all in 1889.

At the observatory in Mauritius in recent years it has been the practice to record minor disturbances in which the winds have not reached hurricane force, and it has been ascertained from these records that about 4 of these more moderate storms are experienced

during the year; they appear to be most frequent at the beginning or end of the cyclone season. These moderate storms have not been included in the table above.

Season of occurrence.—It can be seen from the table above that cyclones are most frequent during the 4 months from December to March. As far as is known no storm has ever occurred in August, but in 1929 a cyclone was recorded as forming in about Lat. 4° S. as early as 23rd September and there is a record of a storm in June, 1859, and of one in July, 1871, the latter occurring in the vicinity of Cocos island.

The official cyclone season in Mauritius during which special reports are received is 1st November to 15th May but cyclones in May and November are very rare. The cyclones occur, therefore, in the summer months of the southern hemisphere which is the time when the SE. trade wind has retreated southwards from the equator and when the northern part of the South Indian ocean lies in a region of westerly and north-westerly winds known as the "NW. or cross monsoon."

Tracks of cyclones.—The usual track of a storm is WSW. curving gradually to SSW. and S. until it finally turns to SE. When the cyclone is in the process of turning to SE. the change of direction is rapid while the motion of the centre slows down very notably. All the storms, however, do not follow this regular path, some may travel in a westerly direction and dissipate without recurving while very rarely a storm has travelled eastwards throughout its life history.

The most westerly point reached by a storm is known as the point of recurvature and its average position is in Lat. 21° S. but this varies considerably and it may lie anywhere between latitudes 8° and 32° S. This latitude shows some seasonal variation and from a study of 89 storms in which the point of recurvature was well-defined it has been possible to construct the following table:—

	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May
No. of storms	4	12	28	20	13	8	4
Mean south latitude of recurvature	17.0°	17.0°	22.2°	22.2°	20.8°	15.0°	14.0°

Authority.—Bibliography No. 25.

This table indicates that the point of recurvature of the storms reaches its most southerly latitude in January and February, which is at the height of the cyclone season; it is in these months also that the tracks extend furthest west. The most easterly points of recurvature are in November and May at the beginning and end of the cyclone season.

The frequency with which storms have moved in given directions is shown in the following table:—

DIRECTION FROM WHICH CYCLONES IN THE SOUTH INDIAN OCEAN HAVE MOVED AS THEY CROSSED THE SPECIFIED PARALLELS OF LATITUDE BETWEEN LONGITUDES 50° AND 70° E.

Lat.	N.	NNE.	NE.	ENE.	E.	ESE.	WNW.	NW.	NNW.	Total.
10° S.	2	6	7	11	1	—	—	—	—	27
15° S.	15	44	57	52	—	—	—	4	13	185
20° S.	59	49	49	31	—	—	7	26	39	260
25° S.	20	19	15	4	—	—	23	43	29	153
30° S.	3	3	2	—	—	—	14	17	7	46

Authority.—Bibliography No. 24 (No. 19).

This table shows that in Lat. 10° S. out of a total of 27 cyclones that were observed 11 of them came from an east-north-easterly direction and similarly in Lat. 20° S. out of a total of 260 observed cyclones 59 of them came from a northerly direction.

The more usual track of storms in November and December is eastward of Madagascar, over Mauritius and Rodriguez, and the December storms may sometimes traverse the Mozambique channel. In January, February and March the storm tracks are in general very similar, but in April they are usually somewhat eastward of those in the earlier months and many of them pass well eastward of Mauritius. There was a violent storm, however, in April, 1892, that was an exception and this passed directly over the island. In May the easterly retreat is continued, the tracks seldom passing westward of Rodriguez, but at the end of May, 1916, a well-formed tropical cyclone of moderate intensity formed in position 10° S., 65° E. and moved south-south-westwards, passing to the east of Mauritius; it recurved in about Lat. 20° 30' S. to south-eastwards. There is no other record in the annals of the observatory at Mauritius of a cyclone having travelled to the west of Rodriguez after 29th April.

The average speed of travel of tropical cyclones is from about 5 to 10 knots north of Lat. 20° S. and as a rule there is no large deviation from this speed in individual cyclones. After recurving and with increasing southerly latitude the speed of travel generally increases. In about Lat. 35° S. speeds of about 20 knots are fairly common and even higher speeds have been known.

III—WIND

1—SURFACE WINDS

Wind-roses for the 5 degree sea areas of the region and for the Chagos archipelago, Seychelles (Mahé), Mauritius, Réunion and Rodriguez for each of the twelve months are reproduced in Figs. 4 to 15; on the roses for the sea areas both direction and force of the wind are indicated, but for the island stations the direction of the wind only is available and the roses represent the mean of

the observations during the day. The corresponding data for the island stations are given in the general climatological tables on pages 63-7, where possible for two hours of observation separately and those for the sea areas in Table II on pages 68-93.

At stations where the information is available the average speed of the wind is included in the general climatological tables. An additional table on pages 94-5 gives for Mauritius the frequencies of winds of different direction and speed at four hours of observation separately, and for Seychelles (Mahé) a table giving the percentage frequency of winds of different forces at 1000 and 1600 local time is given on page 33.

The two principal winds encountered in the area under consideration are the SE. trade and the NW. or cross monsoon winds. When these winds are not blowing and in those places where they do not blow the winds are variable.

SE. trade.—This wind blows throughout the year but it varies in steadiness and extent.

The SE. trade of the South Indian ocean extends from Madagascar and the African coast to the western coasts of Australia and from May to September it is continuous with that of the Pacific. In December the trade wind belt is at its narrowest when it is less than 1,000 miles wide but from May to September, the southern winter, it is at its widest when it is about 1,600 or 1,700 miles across; the average width of the belt is between 1,200 and 1,300 miles.

The following table gives the northern and southern limits of the SE. trade wind belt in the different months of the year in three separate meridians of longitude :—

NORTHERN AND SOUTHERN LIMITS OF THE SE. TRADE WIND BELT IN THE SOUTH INDIAN OCEAN

Note.—All latitudes are south of the equator.

Long.	Limits.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
E. 50°	Northern..	17.5	—	12	6	0	5	0.5	1	1	0	7.5	12.5
	Southern..	27.5	31.5	31.5	29	28	28	26	27.5	21	26	26	14
70°	Northern..	12	12	11.5	7.5	4.5	4.5	1.5	2	2.5	5	8	8.5
	Southern..	29.5	31.5	30	29	29	28	26.5	29	27	26.5	26.5	21
90°	Northern..	10	10.5	11.5	6.5	5	7	4	4	5.5	5	7	7
	Southern..	31	31.5	32	30.5	28	26	26.5	28.5	27	28	28	23.5

Authority.—Bibliography No. 26.

From this table it can be seen that the whole system moves north and south following the sun and that the greatest movement is on the northern side and the least in the south.

The direction in which the SE. trade blows is dependent on the position of the southern anticyclone and its isobaric structure and although it blows over most of the region from a south-easterly

direction it becomes more southerly in the south-eastern portion of the area and at times tends to be easterly on the western side. In the area 10°-25° S., 70°-90° E. the wind is steady and blows mainly from SE. and ESE., particularly from May to September, the months of the SW. monsoon north of the equator. The frequency of the wind from these directions in this area is about 80 per cent; the SE. trade is therefore considerably more intense during the southern winter. During the remainder of the year the wind is less stable and more easterly on the whole with a proportion of NE. and even N. winds. Near the northern and southern limits of the trade wind belt the wind has been known at times during October to April to blow from NW., and when it comes from that direction it is generally unstable and is often interrupted by calms or gales.

The average strength of the SE. trade over the whole area is about Beaufort force 4. From October to April, when the SE. trade is least stable over most of the region, it reaches its greatest steadiness in the area 15°-25° S., 70°-95° E., but even in this season in this area only about 45 per cent of the winds are of Beaufort force 4-5 and 1 per cent of force 8 or more. From May to September on the other hand in the same area the average force of the trade is Beaufort force 5, with 57 per cent of the winds of force 5-6 and 5 per cent of force 8 or more. During May to October the strength of the SE. trade reaches its maximum during the night.

The following table gives the average direction and strength of the SE. trade in the area 10°-20° S., 80°-90° E. in the different months of the year :—

AVERAGE DIRECTION AND STRENGTH OF THE SE. TRADE IN THE AREA 10°-20° S., 80°-90° E.

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Direction	125°	110°	130°	125°	135°	145°	145°	145°	140°	135°	130°	135°
Beaufort force	4	3	3	4	4	4	5	5	5	5	4	4

Authority.—Bibliography No. 27.

NW. or cross monsoon.—During the period from December to March when the NE. monsoon prevails in the North Indian ocean, the area from the equator to about Lat. 10° S. and extending in February to about Lat. 17° 30' S. in Long. 55° E. is occupied by a wind whose general direction is north-westerly. This is called the NW. or cross monsoon; this wind, however, is not so steady as the monsoons of the northern hemisphere but is sufficiently steady over the open ocean to be called a monsoon; it is on the whole rather light and inconstant and the area in which it blows is perhaps better described as one of variable winds, calms and squalls with a certain preponderance in direction from NW. or SE. according to the season.

When the NW. monsoon is fully developed it is most marked between the meridians 65° and 95° E. and it is situated between the NE. monsoon of the northern hemisphere and the SE. trade of the southern. It is steadiest in December, January and February, whilst in October, November and April the winds are much more variable and may blow from any direction.

The boundaries of the NW. monsoon are irregular and lie in more northerly latitudes in the eastern portion of the South Indian ocean. The width of the area increases slightly from west to east; the northern limit nearly touches the northern point of Sumatra whilst the southern limit east of Lat. 100° E. bends to the SE. and reaches north-west Australia. The following table gives the northern and southern limits of the NW. monsoon in the months from December to April when that monsoon is most well-defined:—

NORTHERN AND SOUTHERN LIMITS OF THE NW. OR CROSS MONSOON IN THE SOUTH INDIAN OCEAN

Long.	Limits.	Dec.	Jan.	Feb.	Mar.	Apr.
E.						
45°	Northern ..	6° S.	8° S.	<i>Latitude</i> 5° S.	0°	—
	Southern ..	—	—	—	12.5° S.	5° S.
55°	Northern ..	0.5° S.	3.5° S.	1° S.	1° N.	—
	Southern ..	10.5° S.	15° S.	17.5° S.	11.5° S.	7° S.
65°	Northern ..	2.5° N.	1° S.	1.5° N.	2° N.	—
	Southern ..	9° S.	12° S.	13° S.	13° S.	8° S.
75°	Northern ..	3° N.	1° N.	2.5° N.	5° N.	—
	Southern ..	8.5° S.	11° S.	11° S.	10.5° S.	7° S.
85°	Northern ..	3° N.	2° N.	3° N.	7° N.	—
	Southern ..	8° S.	10° S.	10.5° S.	11° S.	6.5° S.
95°	Northern ..	5.5° N.	5° N.	5° N.	8° N.	—
	Southern ..	6.5° S.	10° S.	11° S.	11° S.	6.5° S.

Authority.—Bibliography No. 27.

Note.—It is not possible to define the northern limit in April.

SE. monsoon.—During the period from May to September when the SW. monsoon prevails in the northern hemisphere, the winds in the area between the equator and Lat. 10° S. blow mainly from SE. or S. and are a northward extension of the SE. trade; they are sometimes referred to as the SE. monsoon. These winds become more southerly or even south-westerly near the equator and blow even more regularly than the NW. winds.

Variable winds.—A permanent centre of high pressure lies in about Lat. 35° S. in which indefinite winds or calms occur. This area of indefinite winds or calms only extends sufficiently far north to Lat. 25° S. to be included in the area under consideration here from about May to November; on the northern limit of this area the SE. trade is only feebly felt.

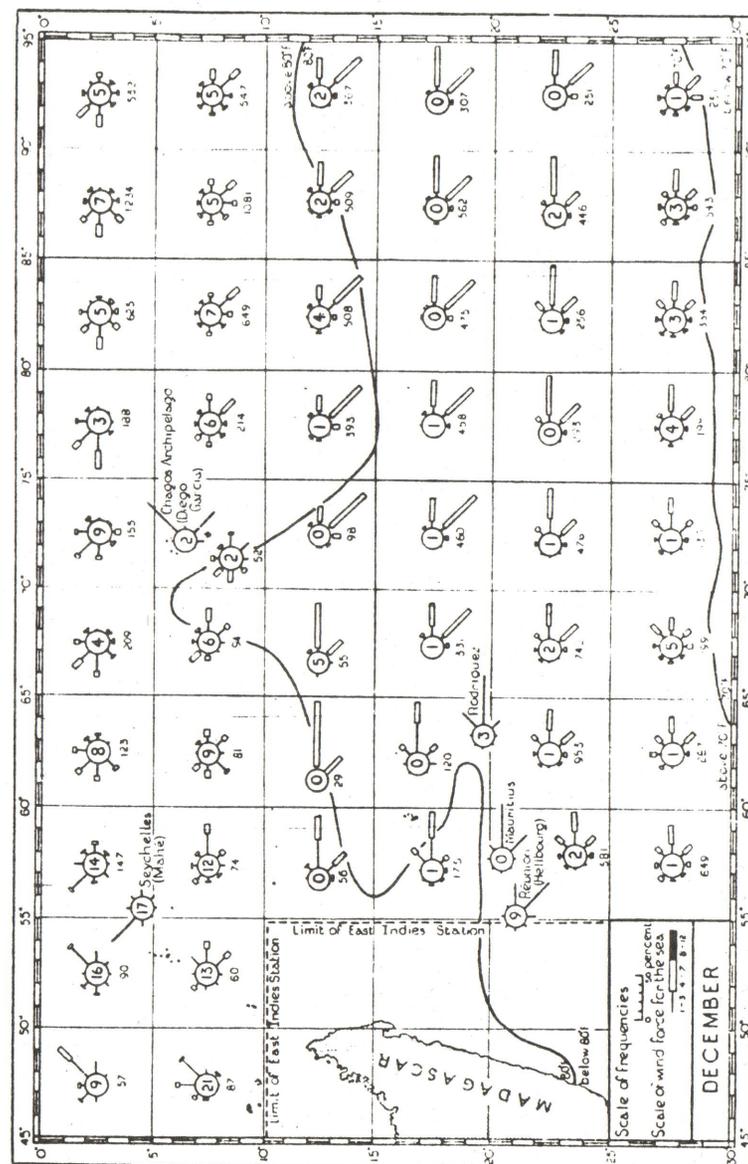


FIG. 4.—SURFACE WINDS—DECEMBER

The figures inside the circles indicate the percentage frequency of calms, and those below the roses for the sea areas the number of observations. The roses are based on the mean of all hours of observation, and on the roses for the islands the wind force is not indicated.

The isotherms of sea temperature for 70° and 80° F. are indicated by the thick lines.

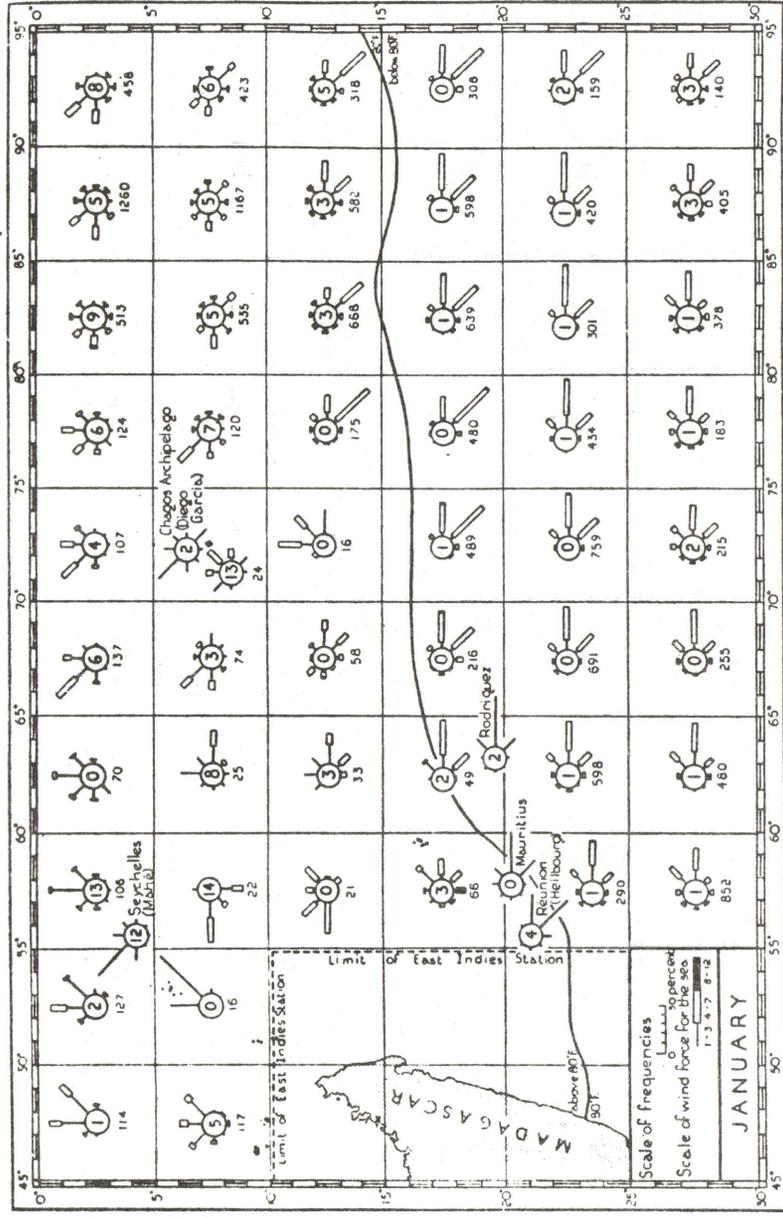


FIG. 5—SURFACE WINDS—JANUARY

The figures inside the circles indicate the percentage frequency of calms, and those below the roses for the sea areas the number of observations. The roses are based on the mean of all hours of observation, and on the roses for the islands the wind force is not indicated.

The isotherm of sea temperature for 80° F. is indicated by the thick line.

10

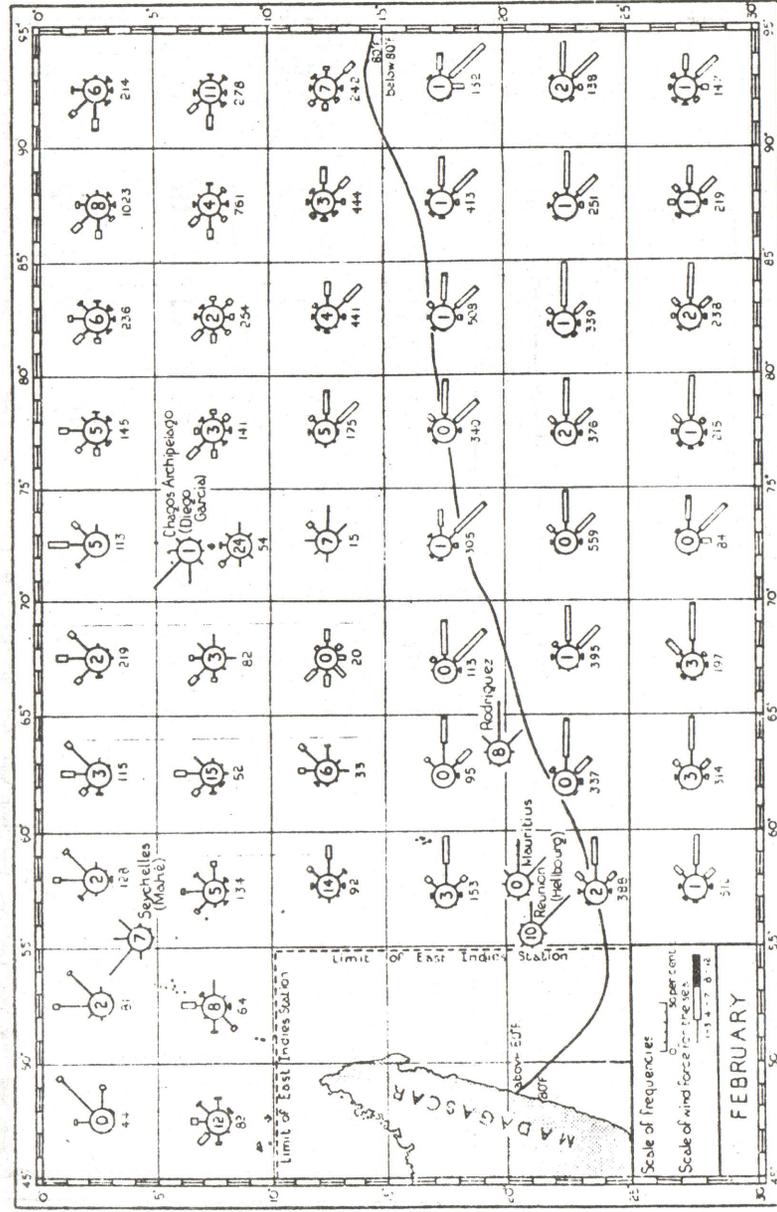


FIG. 6—SURFACE WINDS—FEBRUARY

The figures inside the circles indicate the percentage frequency of calms, and those below the roses for the sea areas the number of observations. The roses are based on the mean of all hours of observation, and on the roses for the islands the wind force is not indicated.

The isotherm of sea temperature for 80° F. is indicated by the thick line.

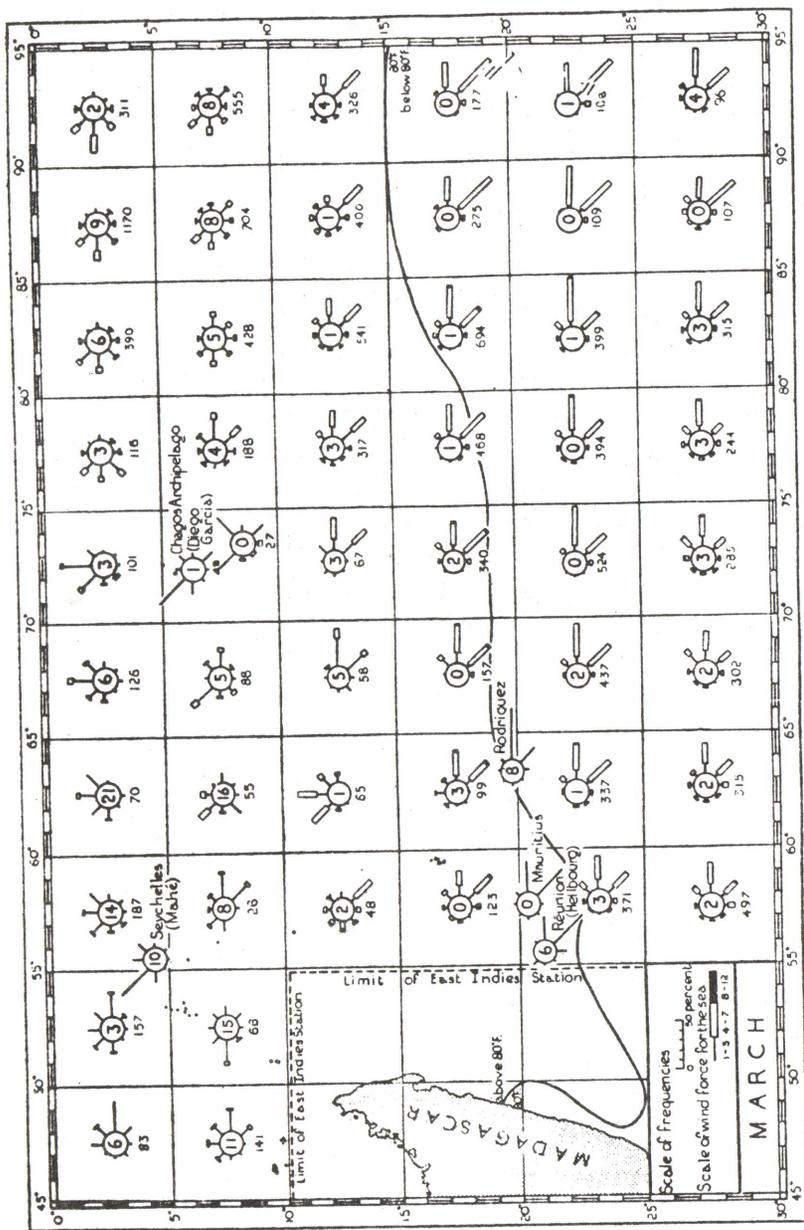


FIG. 7—SURFACE WINDS—MARCH

The figures inside the circles indicate the percentage frequency of calms, and those below the roses for the sea areas the number of observations. The roses are based on the mean of all hours of observation, and on the roses for the islands the wind force is not indicated. The isotherm of sea temperature for 80° F. is indicated by the thick line.

11

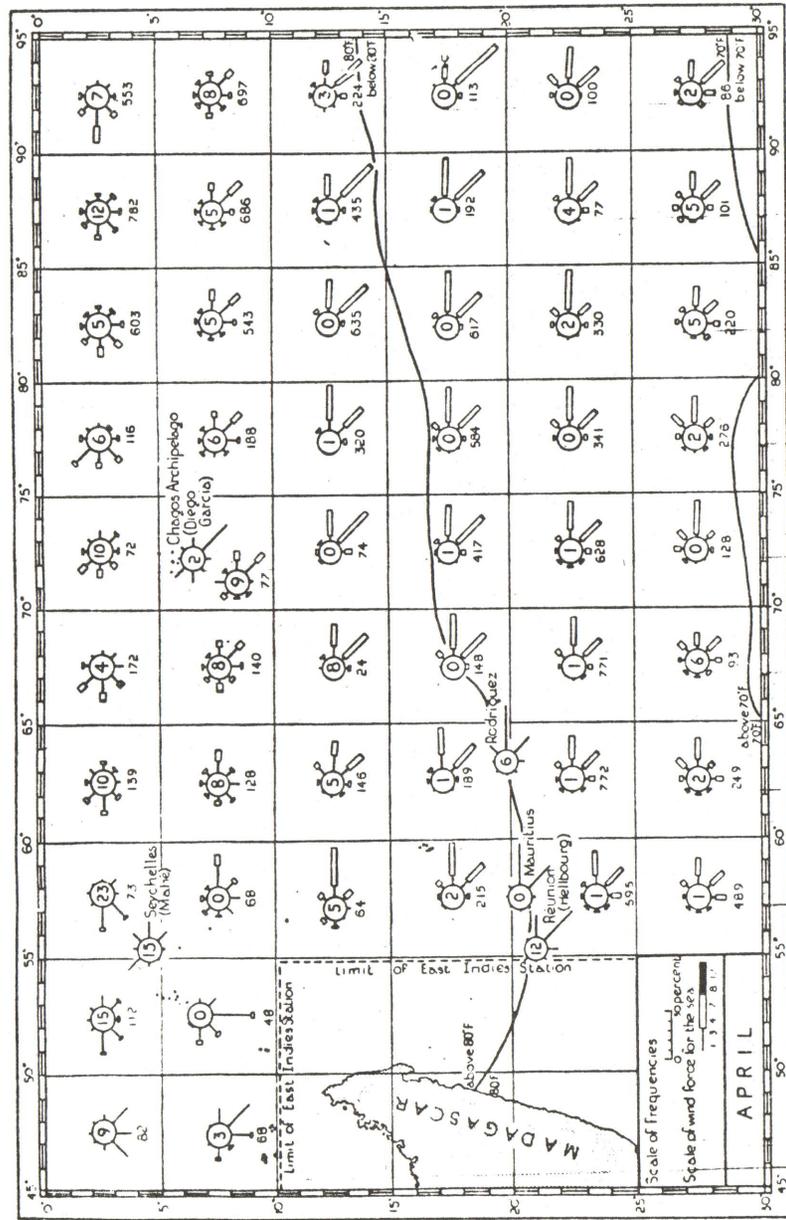


FIG. 8—SURFACE WINDS—APRIL

The figures inside the circles indicate the percentage frequency of calms, and those below the roses for the sea areas the number of observations. The roses are based on the mean of all hours of observation, and on the roses for the islands the wind force is not indicated. The isotherms of sea temperature for 70° and 80° F. are indicated by the thick lines.

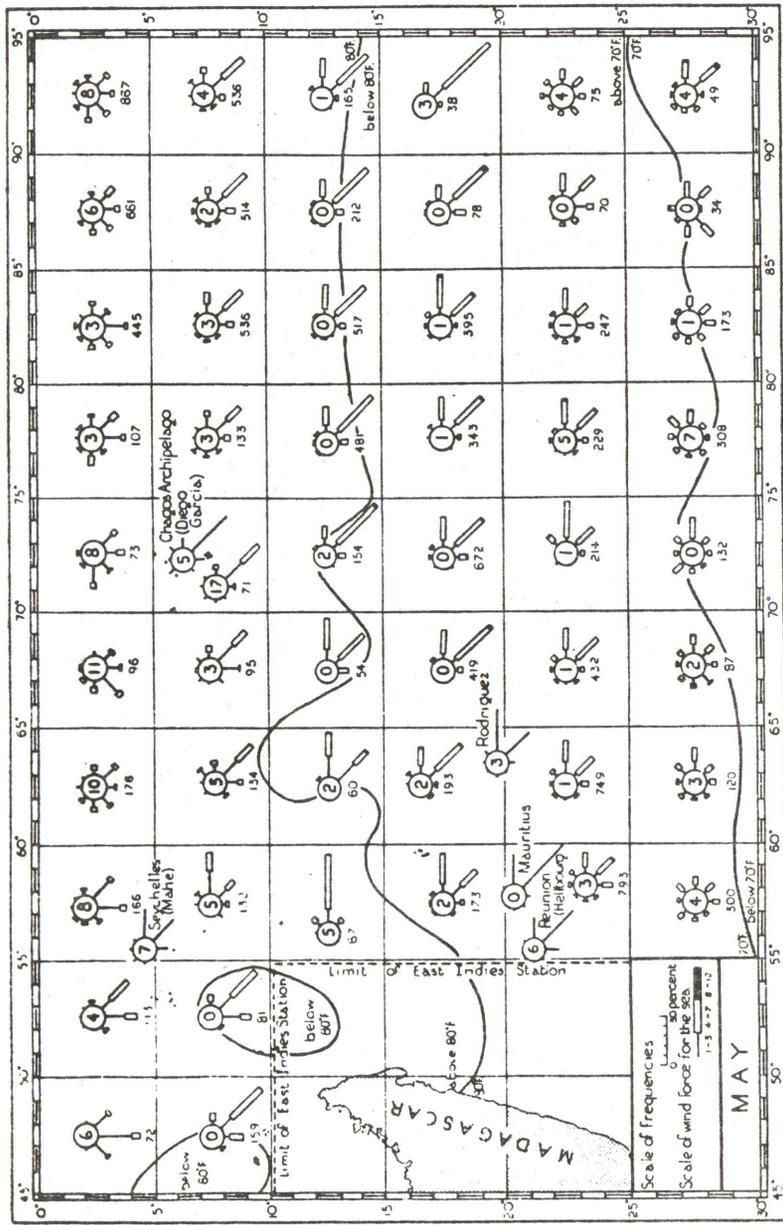


FIG. 9—SURFACE WINDS—MAY

The figures inside the circles indicate the percentage frequency of calms, and those below the roses for the sea areas the number of observations. The roses are based on the mean of all hours of observation, and on the roses for the islands the wind force is not indicated. The isotherms of sea temperature for 70° and 80° F. are indicated by the thick lines.

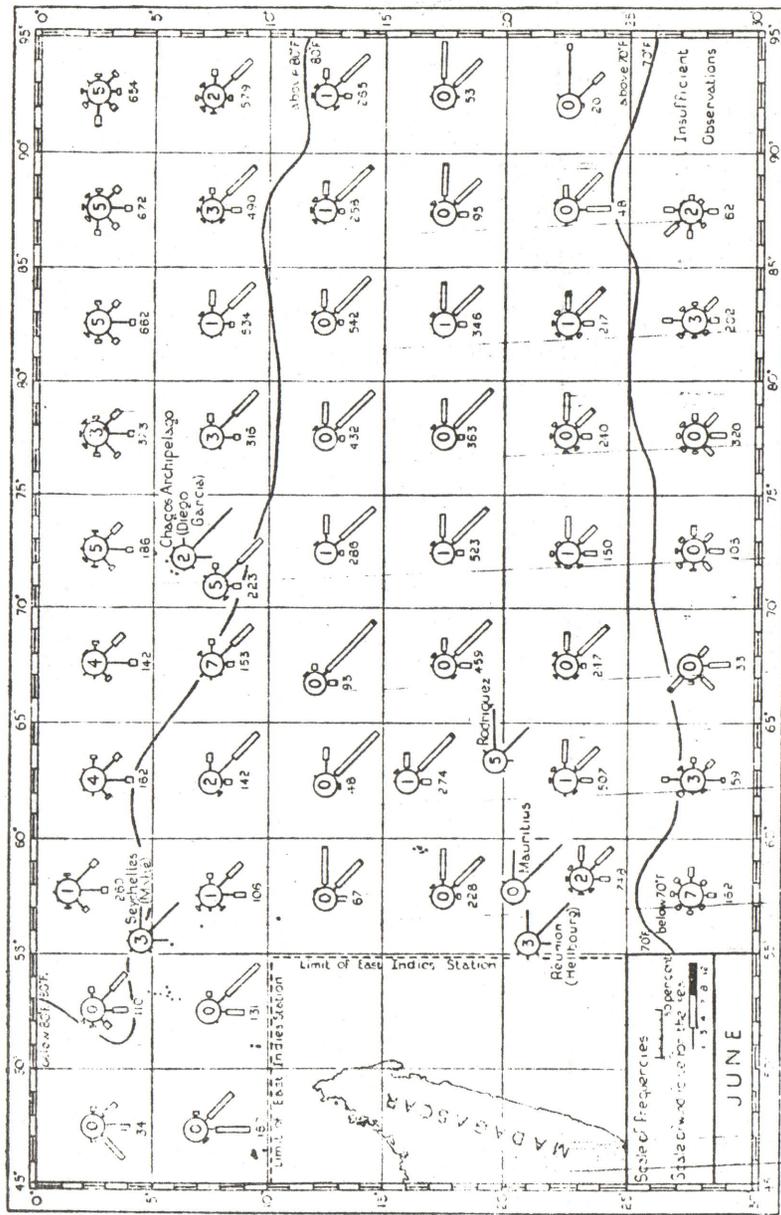


FIG. 10—SURFACE WINDS—JUNE

The figures inside the circles indicate the percentage frequency of calms, and those below the roses for the sea areas the number of observations. The roses are based on the mean of all hours of observation, and on the roses for the islands the wind force is not indicated. The isotherms of sea temperature for 70° and 80° F. are indicated by the thick lines.

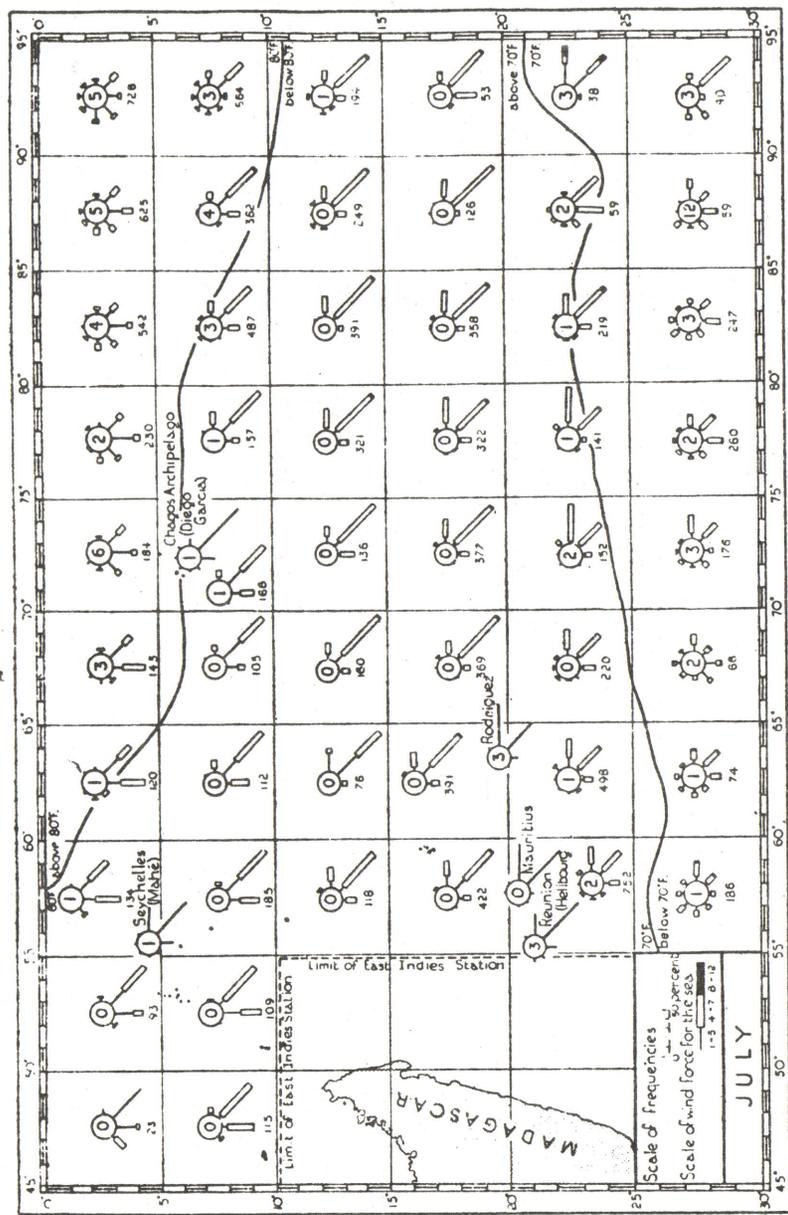


FIG. 11—SURFACE WINDS—JULY

The figures inside the circles indicate the percentage frequency of calms, and those below the roses for the sea areas the number of observations. The roses are based on the mean of all hours of observation, and on the roses for the islands the wind force is not indicated. The isotherms of sea temperature for 70° and 80° F. are indicated by the thick lines.

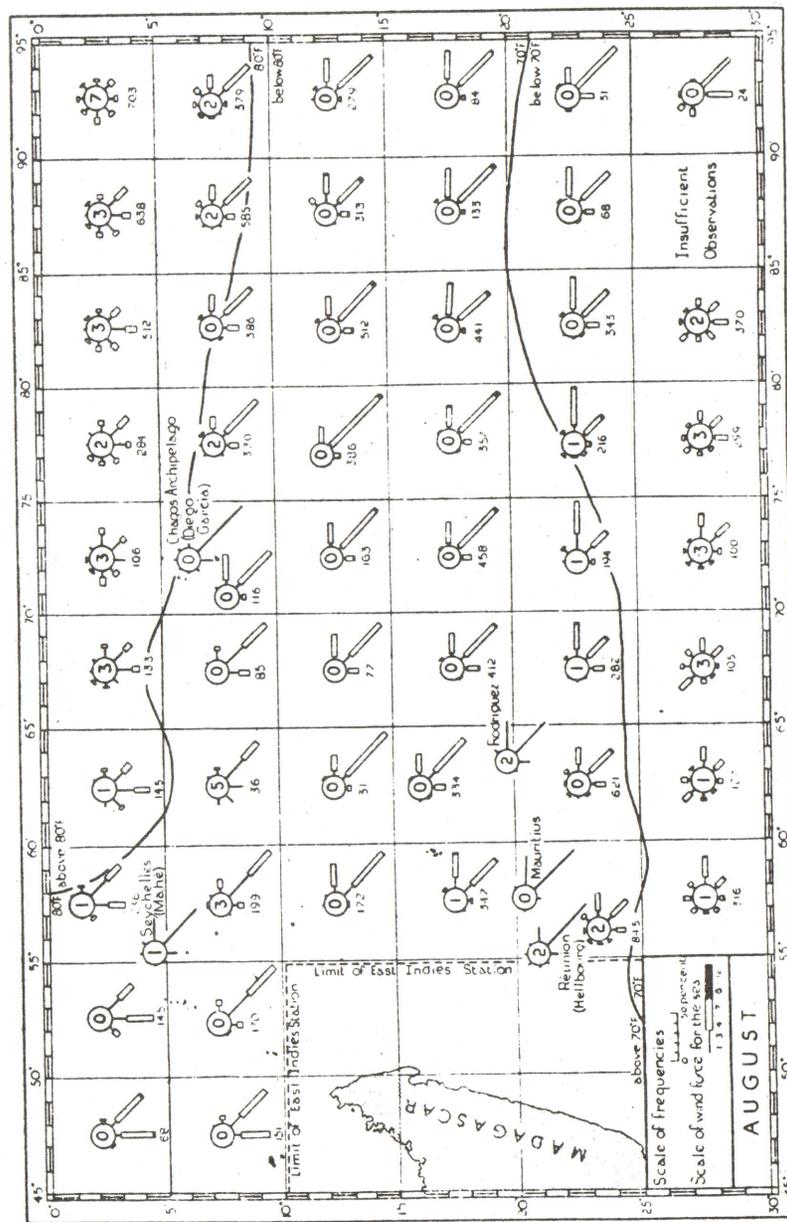


FIG. 12—SURFACE WINDS—AUGUST

The figures inside the circles indicate the percentage frequency of calms, and those below the roses for the sea areas the number of observations. The roses are based on the mean of all hours of observation, and on the roses for the islands the wind force is not indicated. The isotherms of sea temperature for 70° and 80° F. are indicated by the thick lines.

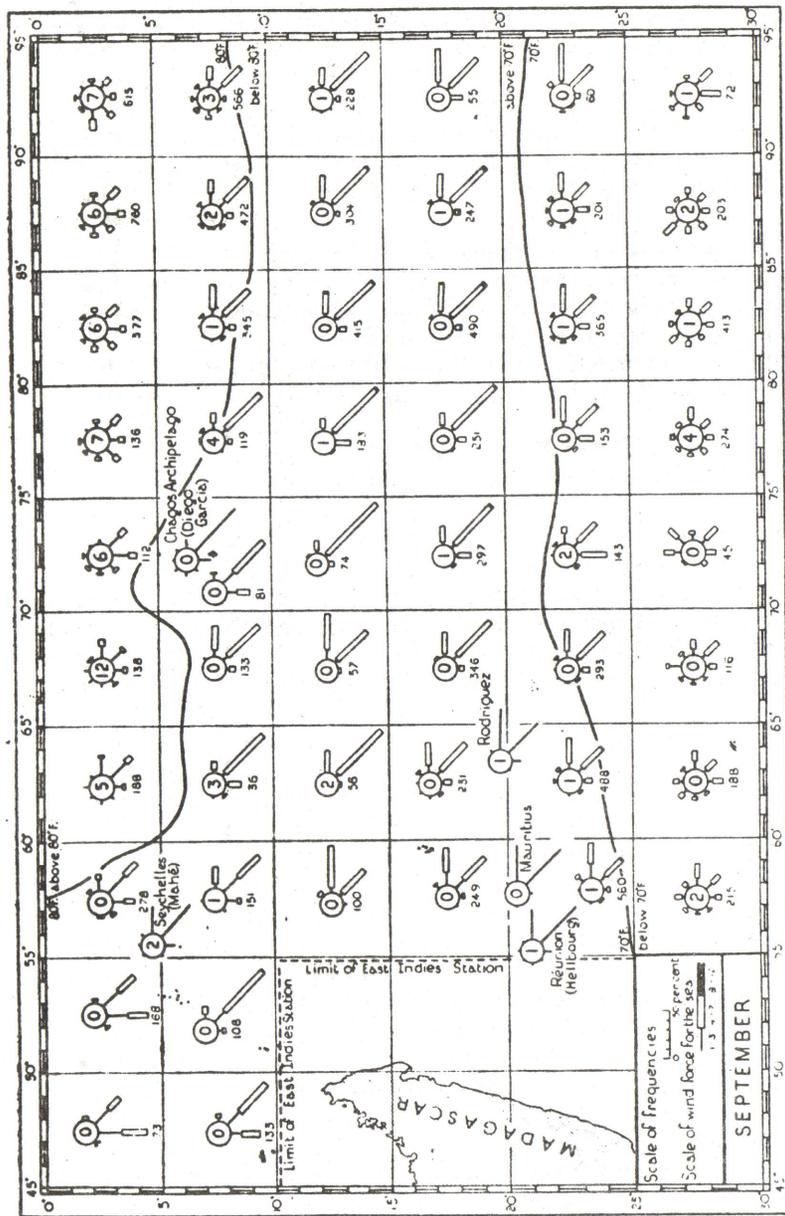


FIG. 13—SURFACE WINDS—SEPTEMBER

The figures inside the circles indicate the percentage frequency of calms, and those below the roses for the sea areas the number of observations. The roses are based on the mean of all hours of observation, and on the roses for the islands the wind force is not indicated.

The isotherms of sea temperature for 70° and 80° F. are indicated by the thick lines.

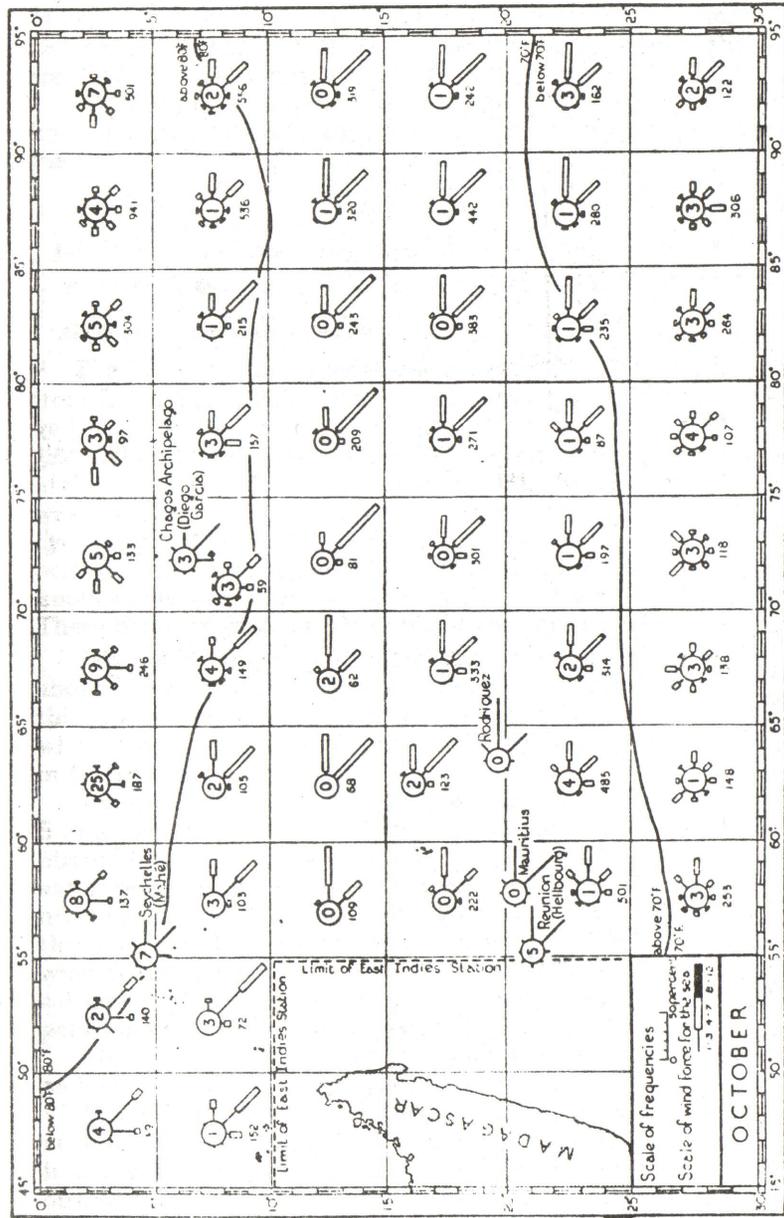


FIG. 14—SURFACE WINDS—OCTOBER

The figures inside the circles indicate the percentage frequency of calms, and those below the roses for the sea areas the number of observations. The roses are based on the mean of all hours of observation, and on the roses for the islands the wind force is not indicated.

The isotherms of sea temperature for 70° and 80° F. are indicated by the thick lines.

Seasonal variation of surface winds over the sea areas

December to March.—In December and January in the extreme north-western part of the area under consideration the NNE. and NE. winds of the NE. monsoon of the northern hemisphere extend as far south as about Lat. 10° S. East of about Long. 55° E., however, between the equator and Lat. 5° S. the winds of the NW. monsoon prevail, whilst south of that latitude the winds are variable; over the remainder of the area south of Lat. 10° S. the winds of the SE. trade are blowing. The strength of the wind of the NW. monsoon is between about 2 and 4 of the Beaufort scale.

In February in the north-west of the region from the equator to about Lat. 5° S. and from Long. 45° E. extending as far east as about Long. 70° E., the NE. monsoon winds are still prevailing but they have disappeared from this area in March. East of about Long. 70° E. the NW. monsoon blows as strongly in February as in the previous month but to the south of Lat. 5° S. the winds are very variable both in direction and force. South of Lat. 10° S. the SE. trade extends over the whole area, and this wind is also blowing here in March, whilst north of Lat. 10° S. the winds are variable in that month.

April and May.—Between the equator and Lat. 10° S., as April is a transitional month, there is no great regularity in the wind direction, but south of that latitude the winds of the SE. trade are blowing with a mean force of from 3 to 5 of the Beaufort scale which may occasionally increase to force 6. In May the SE. trade extends up to about Lat. 5° S. with the winds becoming more southerly as they approach the equator.

June to September.—The winds in June and July are very similar both in direction and force. Over the whole area south of Lat. 5° S. the main direction of the wind is SE. but north of that latitude up to the equator the wind becomes more southerly, and south of Lat. 25° S. the winds are variable. The mean force of the SE. trade winds varies between Beaufort force 2 and 5 and the mean force is generally highest south of Lat. 10° S. The wind is generally stronger in the western half than in the eastern half of the region, exceeding Beaufort force 5 or more at times in some areas.

In August and September the SE. trade still continues to blow over the whole area but south of Lat. 25° S. the winds are still mostly variable and between the equator and Lat. 5° S. in the extreme west the mean direction of the wind is more southerly but becoming more variable in the eastern part of the area.

In the central portion of the area under consideration where the SE. trade is steadiest, the winds are strongest and blow with Beaufort force between 4 and 7 and occasionally even with gale force, but in the areas where the winds are more variable forces between 2 and 4 of the Beaufort scale are usually met with.

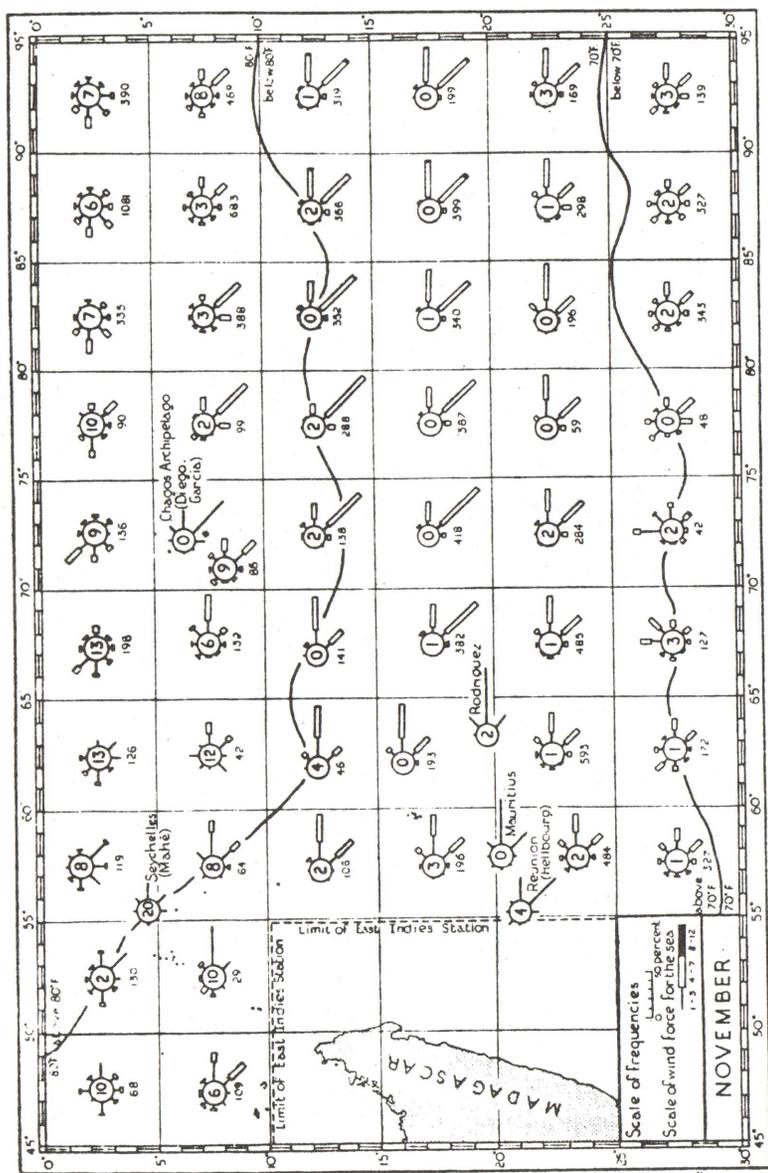


FIG. 15.—SURFACE WINDS—NOVEMBER

The figures inside the circles indicate the percentage frequency of calms, and those below the roses for the sea areas the number of observations. The roses are based on the mean of all hours of observation, and on the roses for the islands the wind force is not indicated. The isotherms of sea temperature for 70° and 80° F. are indicated by the thick lines.

October and November.—Between the equator and Lat. 5° S. October is a transitional month in which there is no regularity in the wind direction, but south of that latitude and also extending up to the equator west of the meridian of 55° E. the SE. trade prevails. The mean force of the wind is greatest in the central areas of the region under consideration where the SE. trade is blowing with the most regularity; here it is blowing mainly with Beaufort force between 4 and 7 with perhaps winds of gale force very occasionally, but the strength of the wind decreases northwards and in about Lat. 10° S. it is between 2 and 5 of the Beaufort scale and near the equator between 2 and 3.

In November the SE. trade continues to blow over most of the region but the main direction is rather more easterly than in October. Between the equator and Lat. 5° S. the north-westerly winds of the NW. monsoon begin to blow with a mean force between about 2 and 3 of the Beaufort scale whilst the mean force of the south-easterly winds is between about Beaufort force 1 and 5.

Surface winds at the islands

Chagos archipelago.—From April to October the archipelago lies within the belt of the SE. trade and this wind may also blow even in November. This SE. trade wind, which sets in during April, blows with great persistence from June to September, when more than 60 per cent of the observations show winds blowing from SE. with about 15 or 20 per cent of them from S. It is unusual to get calms during this period and the average speed of the wind from June to August is between 5 and 6 knots falling to between about 3 and 4 knots in September.

During the remainder of the year the winds are much more variable. From the few observations that are available it would appear that the wind gradually backs, becoming NE. in December, NW. in January and NW. or W. in February and March. From December to March the archipelago lies mainly within the influence of the NW. monsoon but as it lies on its southern limit this monsoon never blows so strongly or steadily here as the SE. trade from June to September. The speed of the wind on the average is between 3 or 4 knots rising to about 6 knots in February.

Mauritius.—This island lies within the SE. trade belt throughout the year and the wind, except from November to March, blows almost constantly from between E. and ESE. It reaches its greatest steadiness from May to August when over 90 per cent of the observations show winds from between E. and SE. The period when the SE. trade is least steady is from November to March but even in those months nearly 75 per cent of the observations show winds blowing from between E. and SE. The resultant direction of the wind changes slightly throughout the year from almost due E. in December and January to about SE. by E. in June. In December and January the wind not infrequently backs to north of east.

The average speed of the wind taken without regard to direction shows very little annual variation. From March to May there is a minimum speed of just over 6 knots which increases to a maximum of about 7.5 knots in August. During the months from May to October when the SE. trade is blowing most steadily the hourly speed of the wind rarely if ever exceeds 23 knots.

The following table shows the highest hourly wind speeds in knots recorded at the Royal Alfred Observatory in each month of the year :—

HIGHEST HOURLY WIND SPEEDS IN KNOTS
Period : 1920-36

Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
36	30	45	36	21	22	23	22	21	20	25	37

Authority.—Bibliography No. 49.

The highest wind speeds have been recorded in the months from December to April, which is the season when tropical cyclones and other less severe disturbances affect the island. In the period 1920-36 an hourly speed of over 30 knots has been recorded in each of those months, whilst on 5th March, 1931, the high speed of 45 knots was experienced. It should be noted, however, that when a severe cyclone passes over the island much higher speeds are likely to occur. During the great storm of April, 1892, a wind speed of 66 knots was recorded for an hour and 77 knots for a period of 5 minutes. There is no information available of the speed of the wind in gusts.

Diurnal variation.—At night the direction of the wind veers about 8 degrees from the mean, whilst by day it backs 11 degrees, this corresponding with conditions in the northern hemisphere where the wind backs by night and veers by day, the movements in the southern hemisphere being reversed.

At the Royal Alfred Observatory in Mauritius, situated about 5 miles north-east of Port Louis and about 3 miles from the coast, observations of the speed of the wind show a fairly regular diurnal variation. The wind speed generally increases from sunrise to a maximum at about 1000, and, subject to only small variations on the average, this maximum lasts from 1000 until 1600 when the wind speed decreases steadily until sunset, followed by a gradual subsidence to its minimum value at about 0100, these conditions persisting as a rule until sunrise.

The speed of the wind when at its lowest is usually about 5 knots and when at its highest about 10 knots.

Wind conditions at the observatory are understood to give a very fair representation of the conditions at sea, but observations from ships would indicate that as a rule the speeds recorded at the observatory are an underestimate of the actual wind speeds experienced over the open sea.

Land and sea breezes.—These breezes are occasionally evident during periods of calm weather when a local circulation is established,

chiefly in the months from December to February. The effect of these breezes has not, however, been investigated in detail at Mauritius and they appear to be unimportant, except on the west and north-west coasts and in such parts of the island as are sheltered from the normal trade wind by the elevated central tableland, where they are prominent.

Réunion.—From April to November the SE. trade blows continuously at this island and varies in direction between ESE. and SE. The south-easterly winds are at their greatest strength during June, July and August, and even from November to March, which is the bad weather season, south-easterly and easterly winds are still very persistent but calms on the other hand may be frequent. Cyclonic storms and heavy gusts may be expected in these months and they are generally followed by a calm or by a westerly or even a north-westerly wind of short duration, before the prevailing south-easterly wind once more sets in.

Diurnal variation.—From April to November the SE. trade usually freshens at about 0900 falling to a light wind at 1600; it then dies away to a calm, or nearly so, during the night. If the wind does not die away during the night it generally blows very fresh on the following day. If, during the day, the breeze is unusually light and dies away earlier than usual, a light land breeze may be expected to blow during the night.

Rodriguez island.—The SE. trade blows more or less continuously all the year round at this island. The main direction of the wind is E. but from May to October, which is the period of most settled weather, the wind blows from between E. and SE. In the months from November to April, a period of more unsettled weather, the wind may sometimes back to NE. by E. and remain there for some days. The average Beaufort force is between 3 and 4 throughout the year with little diurnal variation,

Seychelles (Mahé).—The following table gives the percentage frequency of winds of different forces on the Beaufort scale in each month of the year :—

	FREQUENCY OF WINDS OF DIFFERENT FORCES											
	Number of occasions per hundred											
	Period : 2 years											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
	<i>1000 local time</i>											
Calm ..	5	4	6	13	13	0	0	0	0	10	23	15
Forces 1-3 ..	82	80	81	69	57	50	24	27	30	51	67	77
Forces 4-7 ..	13	16	13	18	30	50	76	73	70	39	10	8
Forces 8-12..	0	0	0	0	0	0	0	0	0	0	0	0
	<i>1600 local time</i>											
Calm ..	5	9	5	15	12	0	0	0	0	11	8	11
Forces 1-3 ..	87	86	81	80	78	40	34	26	42	63	80	74
Forces 4-7 ..	8	5	14	5	10	60	66	74	58	26	12	15
Forces 8-12..	0	0	0	0	0	0	0	0	0	0	0	0

Authority.—Bibliography No. 56.

From about the middle of April to the middle of November the wind blows in the Seychelles from SE. or E. with but little interruption; these winds during this period are sometimes referred to as the SE. monsoon but they are really an extension northwards of the SE. trade. In July and August, at the height of the trade wind season about 80 per cent of the observations show winds from SE. or E. whilst over 50 per cent of them show winds from SE. The average speed of the wind during these months, taken over 24 hours, increases from about 3.5 knots in April to about 10 knots in August; it then decreases again to about 4 knots in November. In all months from June to September the force of the wind more often than not exceeds Beaufort force 3 and in August nearly 75 per cent of the winds exceed that value.

From the middle of November to the middle of April the islands lie within the region of the NW. monsoon; the predominant direction, therefore, in these months is NW. and in February NNW., but as the NW. monsoon is not so steady as the SE. trade the frequency of NW. winds does not exceed 40 per cent of the observations. In the months from November to January the wind is usually light and calms are frequent but there may be violent squalls at times. The average speed of the wind during the NW. monsoon is about 4.5 knots which is slightly more than in the transition months but less than half than that when the SE. trade is blowing, and in December and January the wind speed exceeds Beaufort force 3 in only about 10 per cent of the observations.

Sea breezes.—There are pleasant sea breezes at these islands throughout the greater part of the year.

Amirante Isles (5°-6° S., 53° E. approx.).—H.M.S. Alert visited these islands in March and April, 1882; light winds and calms with occasional rain squalls, the latter as a rule at night, were experienced.

Farquhar islands (10° S., 51° E. approx.).—From April to October south-easterly winds prevail at these islands whilst during the remainder of the year the winds are variable.

Agalega islands (10° 26' S., 56° 40' E.).—The SE. trade wind blows its strongest here in July, August and September.

Gales

Winds of gale force, for the sea areas, are shown on the surface wind-roses in Figs. 4 to 15 on pages 18-29 and the corresponding data are given in Table II on pages 68-93. The number of days of gale in each month and the year at the islands of Mauritius and Rodriguez are given in the general climatological tables.

Over the sea areas under consideration here in approximately the area 15°-25° S., 70°-100° E. where the SE. trade reaches its greatest steadiness, from October to April about one per cent of the wind observations show winds of Beaufort force 8 or more, whilst in the same area from May to September when the SE. trade extends from the equator to about Lat. 25° S. about 5 per cent of the observations give wind forces of 8 or more.

At the island of Mauritius the only gales that have been recorded have been due to tropical cyclones which have passed close to or over the island. As the direction of the gale in these circumstances changes with the position of the cyclonic centre and may be reversed in a few hours it is not possible to give any useful information on the direction of the gales. During a period of 59 years at Mauritius and 9 years at Rodriguez no gales took place during the months from June to November, and the months in which gales are at all likely to be experienced are from January to May and possibly also in December at Mauritius.

Some high wind speeds observed at Mauritius during gales are given on page 32.

Squalls

Within the region between the equator and about Lat. 10° S., the weather is frequently disturbed by squalls accompanied by heavy rain; these squalls in this region may be expected at any time throughout the year. In February and March they occur mostly in the area occupied by the NW. monsoon but they also occur in the western part of the equatorial regions where easterly winds are blowing. In June the squalls may sometimes be accompanied by thunderstorms whilst in September the weather during a squall is often very thick and hazy with very heavy rain. In October the squalls are mainly confined to the regions in the centre and east of the equatorial regions, and in November they occur mostly in the area where the SE. trade is blowing. Heavy squalls of wind and rain are also experienced in the Seychelles in the months from November to January. In fine weather the force of the wind is usually about Beaufort force 2 to 3 but during a squall it will generally increase to between forces 6 or 7.

The following are two reports of squalls experienced by ships in the equatorial regions under consideration here:—

On 6th January, 1927, a violent rain squall was experienced in Lat. 0° 06' S., Long. 85° 05' E. This violent rain squall occurred at 0040 and a wind force between 6 and 7 of the Beaufort scale was experienced, the squall lasting until 0115. The wind which had previously been blowing from WSW. at 0025 veered to NW. by N. and during the squall veered further to NNW. after which it backed to NW. and then at 0200 to WNW. when the wind force dropped to Beaufort force 2 to 3. At 0300 the wind continued to back to WSW., finally remaining in that direction, the wind force increasing slightly to Beaufort force 3 to 4.

The other squall was reported as occurring in Lat. 4° 40' S., Long. 89° 20' E. at 1700 on 11th September, 1927, and was of the line squall type. It travelled towards the SSE. and lay in a west-south-westerly to east-north-easterly direction.

MAURITIUS (Vacoas)

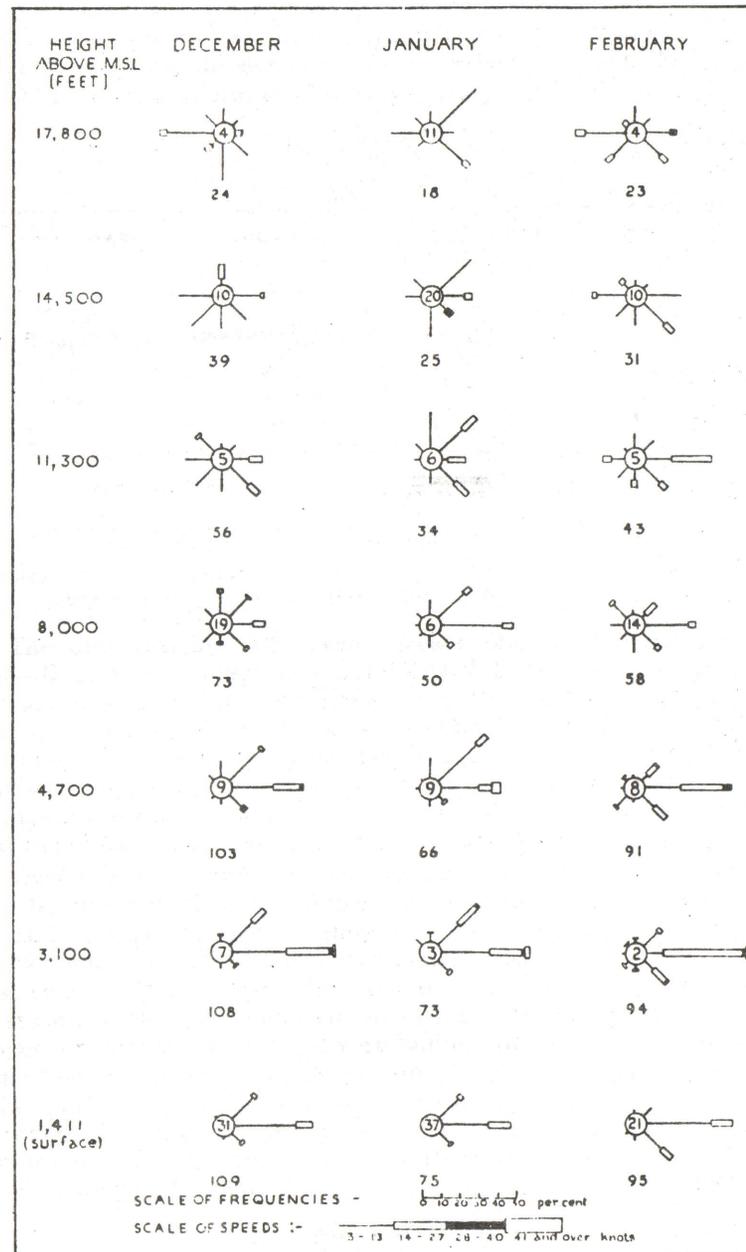


FIG. 16—UPPER WINDS—MONTHLY

Figures inside the circles indicate the percentage frequency of calms.
Figures below the roses indicate the number of observations.

Upper
Surface winds
MAURITIUS
(Vacoas)

8 37

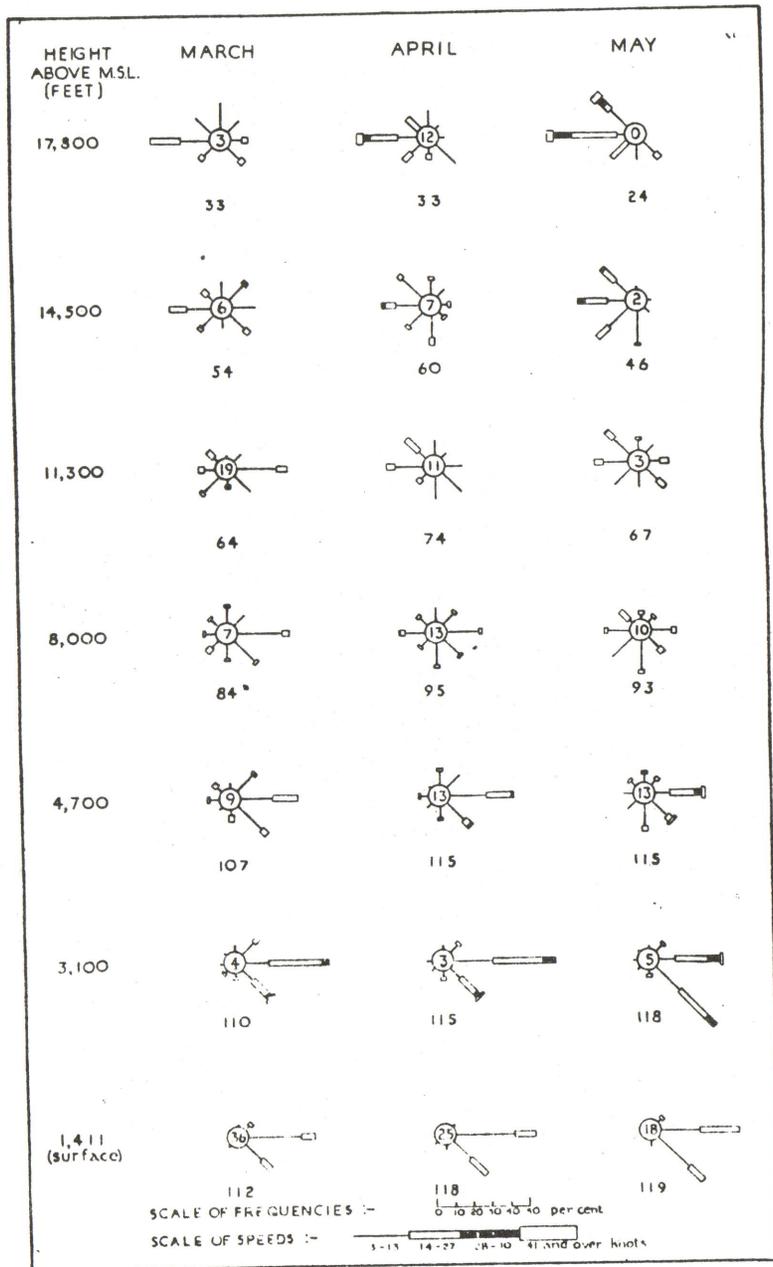


FIG. 17—UPPER WINDS—MONTHLY

Figures inside the circles indicate the percentage frequency of calms.
Figures below the roses indicate the number of observations.

8 38

South Indian Ocean
MAURITIUS
(Vacoas)

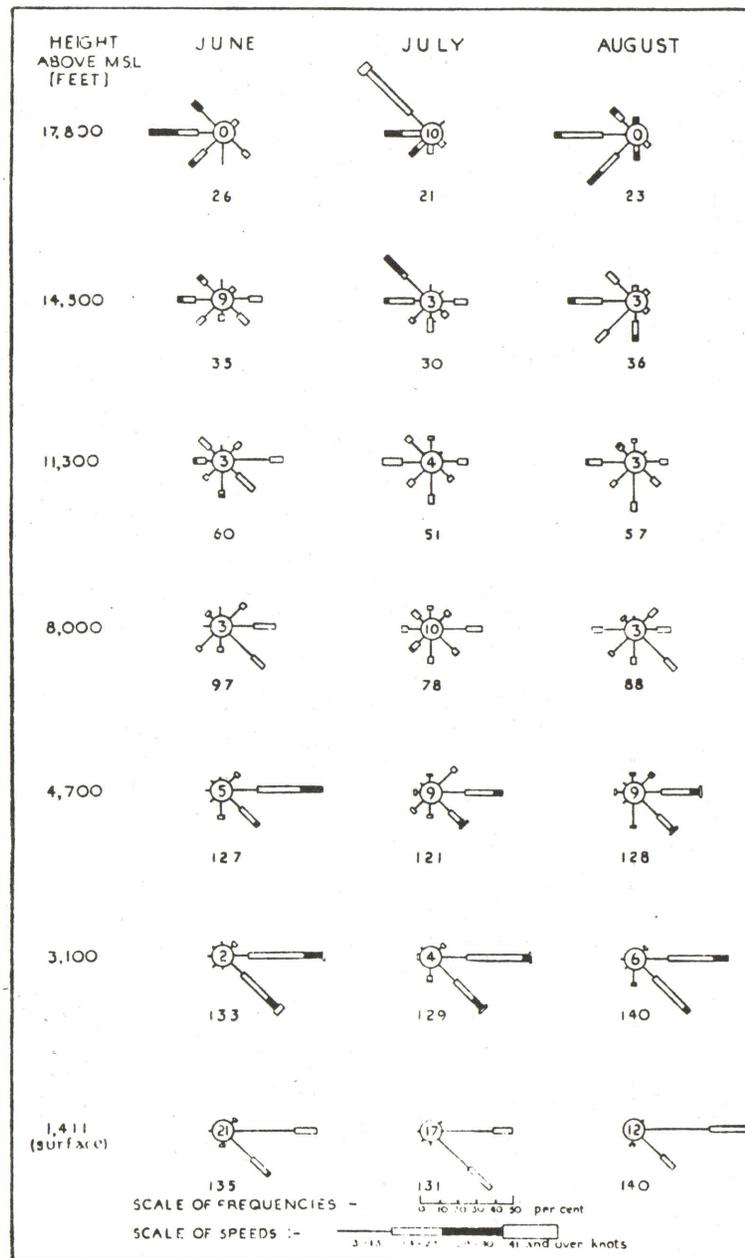


FIG. 18—UPPER WINDS—MONTHLY

Figures inside the circles indicate the percentage frequency of calms.
Figures below the roses indicate the number of observations.

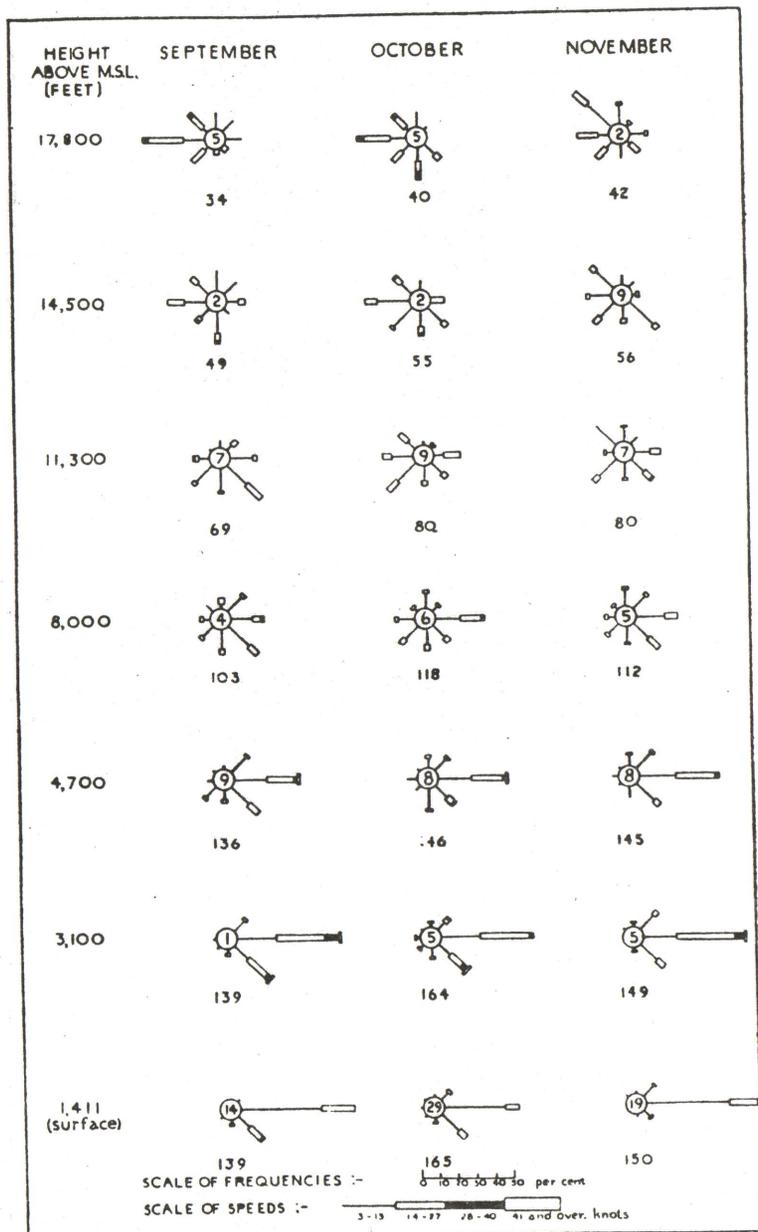


FIG. 19—UPPER WINDS—MONTHLY

Figures inside the circles indicate the percentage frequency of calms.
Figures below the roses indicate the number of observations.

Observations of upper winds for the region under consideration are only available for the island of Mauritius. Monthly wind-roses for heights up to 17,800 feet are reproduced in Figs. 16-19 and for groups of three months at 21,000 feet in Fig. 20 below, whilst the corresponding data are given in Table IV on pages 96-9.

MAURITIUS
(Vacoas)

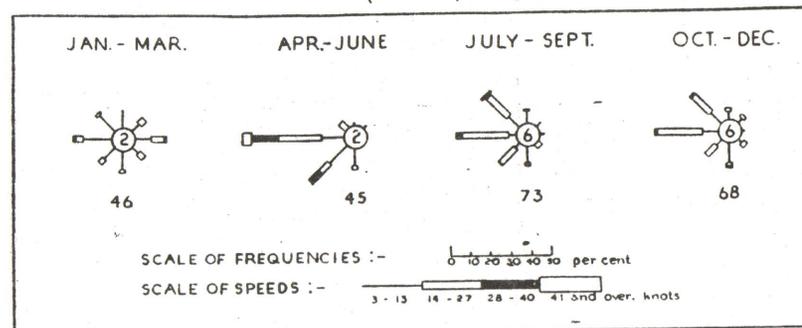


FIG. 20—UPPER WINDS AT 21,000 FT.—SEASONAL

Figures inside the circles indicate the percentage frequency of calms.
Figures below the roses indicate the number of observations.

The observations have been carried out during the period 1925-37 at Vacoas which is about 1,410 feet above mean sea level, the balloons used have, therefore, been released from this height. The time of the observations is variable but chiefly during the forenoon. It should be remembered that observations of upper winds by means of balloons are often liable to interruption; winds at high levels during bad weather are probably not fully represented and the observations refer principally to fine weather only.

Owing to the extent of the area under consideration it should not be inferred that the upper air conditions at Mauritius are necessarily representative of those over the whole region, but from an examination of observations obtained from a few stations on the east coast of Madagascar, which is outside but not very far to the westward of the area under consideration, it would appear that the upper air circulation there is very similar to that at Mauritius, so conditions in the upper air may probably be very much the same in other parts of the trade wind belt. In the absence of more data it is proposed therefore to give a brief general description of the upper air circulation at Mauritius and then the probable general circulation over the remainder of the area.

Upper winds at Mauritius

From observations which have been obtained up to about 26,000 feet it is noticeable that there is a distinct seasonal variation

between winter and summer. It should be remembered that in the southern hemisphere the winter is during the months from May to August and the summer from December to February. The following is a brief summary of conditions in the upper air over Mauritius during the summer and winter months, all the heights are given above mean sea level and not from the surface of the observing station which is 1,410 feet above mean sea level:—

Summer (December to February).—The wind during this season up to about 3,000 feet is generally between E. and NE. with an average speed of about 12 knots and this decreases with height to about 6 knots between about 10,000 and 20,000 feet where the wind becomes easterly or variable in direction. Above that height westerly winds are blowing and at about 27,000 feet the average speed of these westerly winds is between about 10 and 15 knots.

Winter (May to August).—The wind up to about 3,000 feet is generally ESE. with an average speed of about 19 to 20 knots, this speed then decreases with height to about 10 knots between about 7,000 and 11,000 feet where the wind becomes southerly or variable in direction. Above that height the wind is westerly with a speed gradually increasing to between about 20 to 30 knots at about 24,000 feet.

From the above very general description of the wind and its speed at various heights during the summer and winter months it can be seen that the winds throughout are strongest in the winter and that in both seasons they decrease in speed above 3,000 feet but increase again when higher levels are reached.

There are also three layers of winds between the surface and about 26,000 feet and the height at which these layers are to be found varies according to the season.

In the first layer near the surface there are light to moderate easterly winds which have a considerable southerly component in the winter and a small northerly component in the summer. In the higher second layer between the lower easterly and upper westerly air currents, there are light and indefinite winds which in winter extend from about 7,000 to 11,000 feet whilst in summer this layer is much deeper and extends from about 10,000 to 20,000 feet. In the intervening months between the winter and summer seasons there are intermediate values. The third or highest layer consists of moderate to strong westerly winds. There may, however, be considerable day to day changes in the height at which these westerly winds are reached, and these can be seen in the following table which gives the maximum and minimum heights at which the upper westerly winds were encountered during the balloon ascents that were carried out at Mauritius from July to December 1925.

MAXIMUM AND MINIMUM HEIGHTS AT WHICH UPPER WESTERLY WINDS WERE ENCOUNTERED AT MAURITIUS

Year: 1925

	July	Aug.	Sept.	Oct.	Nov.	Dec.
	ft.	ft.	ft.	ft.	ft.	ft.
Maximum height ..	14,750	11,450	19,700	16,400	18,000	16,400
Minimum height ..	2,500	1,600	4,900	surface	1,600	3,300

Authority.—Bibliography No. 34.

During the passage of V-shaped depressions the upper westerly winds are persistently encountered at low altitudes, when, however, a high pressure system is prevailing the frequency with which these westerly winds descend to low altitudes is very much smaller.

There have been some observations of the wind above 26,000 feet and from the few that have been obtained it seems to be indicated that the westerly air current continues up to at least 47,000 feet, which is the greatest height reached, and that the speed of the wind gradually increases with height.

Although unusual it is possible for westerly winds to be experienced from about 26,000 feet right down to the surface whilst in some cases the wind may be easterly instead of westerly at great heights. There is an example of this peculiar weather type, in which a strong south-easterly air current was found at a high altitude, occurring at Mauritius on February 13th, 1926. The wind on this occasion, from the surface to about 6,000 feet was north-easterly; it then became south-westerly and later south-easterly up to about 18,000 feet when it altered to a south-westerly wind which continued to blow up to about 23,000 feet after which it became a strong SE. wind which persisted up to at least 26,000 feet. It will be seen then that there was a south-westerly air current sandwiched in between two easterly air currents.

As far as can be judged there is no well-defined weather system at Mauritius that accompanies these peculiar upper air conditions but the sky is generally cloudless and deep blue, the surface wind speeds are low and the directions and speeds vary greatly with height until the south-easterly air current is met with at a high altitude. The wind speeds at flying altitudes, however, even in this unusual type are light.

General upper air circulation

As regards the general upper air circulation over the other areas; in the equatorial regions the wind above the monsoons will become easterly, whilst in the areas where the SE. trade is blowing it is considered that conditions are very similar to those at Mauritius and that in the winter months the winds will be south-easterly at the surface after which there will be an intermediate layer of light southerly or variable winds above which, extending up to great heights, the wind will be found blowing from a westerly direction.

The following table is reproduced to show the suggested heights at which the reversal of the wind from an easterly to a westerly direction probably takes place at high altitudes in the South Indian ocean in the different latitudes :—

PROBABLE HEIGHTS AT WHICH THE UPPER WESTERLY WIND IS ENCOUNTERED IN THE DIFFERENT LATITUDES

Lat.	Height	Lat.	Height	Lat.	Height
S.	ft.	S.	ft.	S.	ft.
10°	58,000	14°	25,900	18°	13,800
11°	45,900	15°	21,650	19°	11,800
12°	38,000	16°	18,400	20°	10,500
13°	31,200	17°	15,700	—	—

Authority.—Bibliography No. 33.

From this table it will be noticed that there is a gradual slope downwards from north to south in the height at which the upper westerly air circulation is encountered. In the winter of the southern hemisphere owing to the northward movement of the trade wind belt the height at which this reversal in the direction of the wind takes place is lower than in the summer.

3—CLOUD MOTION AT MAURITIUS

From observations that were made of cirrus cloud at Mauritius it was noticed that they almost invariably showed a westerly drift and that in the summer months the speed of the drift seemed to be between about 20 to 40 knots.

The following table gives the percentage frequency of winds from different directions to the nearest eight points from cloud observations at Mauritius. These observations were made during the years 1904–10. The number of observations taken of cirrus and altocumulus clouds is given in the table and those for the surface observations are for the hourly readings of the anemometer during the period. This table is constructed to refer to the year as a whole, but as the observations of cirrus from June to September were scarce it is not justifiable to say that there is no annual variation. The altocumulus cloud which has some westerly component has a decided annual variation, there being a maximum from February to June and a minimum from August to October.

PERCENTAGE FREQUENCY OF WINDS FROM DIFFERENT DIRECTIONS FROM CLOUD OBSERVATIONS AT MAURITIUS
Period : 1904–10

	N.	NE.	E.	SE.	S.	SW.	W.	NW.	No. of obs.
Cirrus ..	4	1	0.3	0.7	2	13	51	28	393
Altocumulus	13	24	17	4	4	6	14	19	487
Surface ..	3	10	47	30	4	2	2	2	61,268

Authority.—Bibliography No. 35.

In the above table the change from easterly winds at the surface to westerly winds at the cirrus level is clearly shown and it will be noticed that there is a double maximum at the altocumulus level which is probably due to two different types of this cloud having been included. One type very likely occurs in the upper air circulation at about 16,000 feet and the other in the lower circulation at about 5,000 feet.

IV—VISIBILITY

A table giving the percentage frequency of visibilities between various limits in the different months of the year for the morning and afternoon for Seychelles (Mahé), and for Mauritius (Royal Alfred Observatory) in the four seasons for the morning observation only, is given on page 100. Another table showing the various visibilities in relation to the wind direction in the four seasons of the year for Mauritius (Royal Alfred Observatory) is given on page 101. The number of days with fog at Mauritius and the number of days with visibility less than 2 miles at Seychelles (Mahé) are included in the general climatological tables on pages 64 and 67.

As a rule good visibility prevails over the whole region except during rainstorms when the visibility may become temporarily very much reduced. At Seychelles (Mahé) visibility usually exceeds 10 nautical miles except in the months from June to August, when it lies between 5 and 10 miles. At Mauritius visibility shows very little seasonal variation although on the whole it is slightly better in the autumn (April and May) and spring (October and November) than at other times of the year. It appears to be rather better also with southerly winds than with northerly, but except in the directions of the prevailing winds, which are between NE. and SE., the observations are too few to give a very reliable indication. Fog appears to be rare in any part of the region and it very seldom occurs in the South Indian ocean north of Lat. 30° S., but wet fogs have been experienced near the centres of cyclones.

At the island of Mauritius fogs are rare in the coastal regions and in the lowlands. Wet fogs, however, are quite frequently observed over the central tableland in summer after very heavy rain when the wind drops suddenly. Whilst fog is uncommon clear of the land it can, however, be expected in the more elevated parts of the island where fog in winter is common during wet weather at places about 2,000 feet above sea level. In certain types of wet weather, fog will form rapidly during the late afternoon or after sunset in the highlands. At times the highlands are enveloped in cloud; this may also occur in the interior of the island of Réunion where it may set in very suddenly. At Rodriguez fogs are reported to be rare at or near sea level but low visibility will occur during heavy rain.

V—CLOUD

The data giving the monthly variation of the mean cloud amount for the morning and afternoon observations separately for Mauritius, Réunion, Rodriguez and Seychelles (Mahé) are given in the general climatological tables on pages 64-7. For the Chagos archipelago the data given in the general climatological table on page 63 are for the mean of the day only. The step diagrams reproduced in Fig. 21 below, except for Réunion, are for the mean of the 2 hours of observation. On page 102 a table is reproduced giving the percentage frequency of overcast skies and type of cloud in relation to the wind direction at Mauritius (Royal Alfred Observatory).

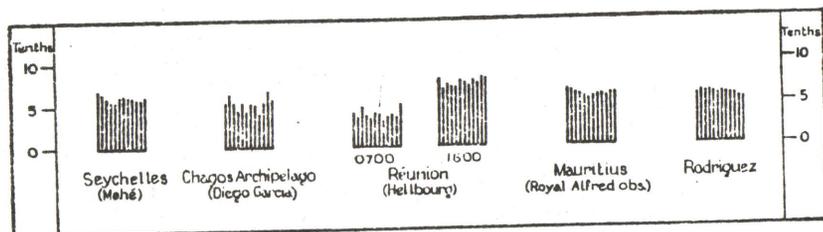


FIG. 21—MONTHLY VARIATION OF MEAN CLOUD AMOUNT

Over the whole region there is no well pronounced seasonal variation of cloud amount, mean amounts ranging mostly between 4 and 6-tenths in all months. In the summer months of the southern hemisphere the highest cloud amount occurs roughly between latitudes 5° and 8° S. where it is about 6-tenths, and in the winter months the highest cloud amount of about 6-tenths occurs in the eastern portion of the region, whilst in the extreme east in approximately the area 2°-5° S., 80°-90° E. it may be as much as 7-tenths. These are the conditions over the open sea and at the low-lying islands; at the islands of Mahé (Seychelles), Mauritius and Réunion which are high and mountainous they are also very much the same. The Chagos archipelago, which is in the north of the area, has the lowest average annual cloud amount with just over 5-tenths, whilst at Réunion, Mauritius, Rodriguez and the Seychelles it is about 6-tenths. There are no very well-marked months of maximum and minimum cloudiness anywhere.

At the Seychelles, Rodriguez, Mauritius and Réunion cloud amounts have been published for observations during the morning and afternoon, these show that there is always less cloud in the morning than in the afternoon, except from August to November at Rodriguez, where the morning is slightly cloudier than the afternoon. The difference, however, in the Seychelles is less than 0.5-tenths, but at Réunion on the other hand, which has its observatory about 3,000 feet above sea level, the difference is much larger and on the average it is between 3 and 4-tenths and in some months may be nearly 5-tenths.

Hourly observations of cloud amount have been taken at Mauritius over a period of 10 years and from these a well-marked diurnal variation is noticeable. A minimum amount occurs shortly before midnight and a maximum in the early afternoon. The range in the winter is between 1 and 2-tenths and at other seasons of the year between 2 and 3-tenths.

The following table gives the number of days of clear and cloudy skies at the Seychelles and Mauritius. The data for the Seychelles are for two hours of the day but they refer to 2 years of observation only and are rather irregular whilst those for Mauritius are for three hours of the day and as they are for a 10-year period they are considered more reliable. The definitions of clear and cloudy skies are not quite the same in each case, that for Seychelles refers to a sky that is perfectly clear and one that is completely overcast, whilst that for Mauritius refers to a sky that has a cloud amount less than 2-tenths and one that has more than 8-tenths of cloud. In the tables for Mauritius the last line shows the frequency with which the sky was less than 2-tenths covered or had more than 8-tenths of cloud on the average throughout the 24 hours:—

NUMBER OF CLOUDY DAYS AND DAYS WITH A CLEAR SKY AT THE SEYCHELLES AND MAURITIUS

Local time	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
CLOUDY DAYS													
(a) Seychelles (period 2 yrs.)													
(Cloud amount 10-tenths)													
1000	3.5	3	1	2.5	3	0.5	2.5	3	3	2	3.5	4.5	32
1600	5	5	3.5	4	3.5	2	4.5	6.5	6	3.5	6.5	7.5	57.5
(b) Mauritius (1927-36)													
(Cloud amount greater than 8-tenths)													
0600	10	8	7	8	9	8	9	8	11	7	7	8	100
1200	12	10	10	9	7	6	6	7	8	7	10	9	101
1800	14	11	12	13	10	8	8	8	7	8	11	14	124
Mean of 24 hrs.	7	6	5	6	4	3	3	2	4	1	3	5	49
DAYS WITH A CLEAR SKY													
(a) Seychelles (period 2 yrs.)													
(Cloud amount 0-tenths)													
1000	0	0	0	0	0	0	0	0	0	0	0	0	0
1600	0	0	0	0	0	0	0	0	0	0	0.5	0	0.5
(b) Mauritius (1927-36)													
(Cloud amount less than 2-tenths)													
0600	3	2	3	5	5	5	4	5	3	5	2	3	45
1200	0.2	0	0.7	0.7	2	2	1	0.9	1	0.9	0.4	0.2	10
1800	0.1	0.4	0.8	1	3	2	3	0.9	2	1	0.5	0.6	15
Mean of 24 hrs.	0.2	0.1	0.7	0.9	3	2	1	1	0.7	0.6	0.1	0.2	10.5

Authorities.—Bibliography Nos. (a) 56, (b) 49 and 55.

VI—RAIN AND HAIL

1—RAIN

In the warm season of the South Indian ocean north of Lat. 30° S., which is from about November to April, it is the tropical cyclones and depressions that bring the rain whilst in the

other months of the year, May to October, which include the winter months of the southern hemisphere and also the months when the SE. trade is most intense it is usually the anticyclones that bring it.

Types of rainfall

In the region under consideration which includes large areas of open ocean and several small islands, some of which are low-lying whilst others are hilly and mountainous, the rainfall can be divided into three main types:—Orographic, Cyclonic and Instability and with the last is included cold front rain.

Orographic rain.—This type is experienced in the hilly and mountainous islands such as Mauritius, Réunion, Rodriguez and some of the Seychelles group. A good deal of the rain in the winter months, which is the season when the SE. trade is most persistent, is of this type. It is generally a fine rain and is always accompanied by an increase in the force of the SE. trade. In Mauritius the effect of orography in the south and south-east of the island is shown by the increase of rain with height; in the winter from June to August the amount in the three months increases by more than 40 mm. (1.5 in.) for every 100 feet of height up to 1,000 feet but rather less thereafter and the annual total increase for the year is roughly 200 mm. (8 in.) per 100 feet up to 1,500 feet.

Cyclonic rain.—This type of rain is experienced over the whole area in the months from November to April. Cyclonic rain is very irregular but as it is often very heavy it is responsible for a large part of the annual average. Near the centre of a cyclone torrential rain falls for a short period but away from the centre the fall, although less heavy, may continue for two or three days. At Mauritius a cyclone travelling westward and passing the island to the north always gives more rain than one which passes to the east.

Instability and cold front rain.—This is the convectional type of rain and it is also associated with thunderstorms and may be experienced over the open ocean as well as at the islands. It occurs most often in the months from January to April and sometimes in May. It is usually due to an equatorial current of air which has originated in some northerly point being pushed up above the SE. surface air current thus causing thunderstorms.

The cold front rain may occur in any part of the region and is usually in the form of heavy showers similar to the instability type of rain, these showers are due to an inflow of colder air undercutting the warmer air on the surface.

Annual and seasonal rainfall and rain-days

South Indian ocean north of Lat. 30° S.—Observations of rainfall and rain-days over the sea are too infrequent to be very reliable, the information therefore given in the following paragraphs is of a very general character.

Over that part of the South Indian ocean under consideration here between the equator and Lat. 10° S. and in the vicinity of the

Chagos archipelago the average total annual amount of rain is between about 2,000 and 3,000 mm. (80 and 120 in.), whilst in the vicinity of Mauritius, Réunion and Rodriguez islands it is between about 1,000 and 1,500 mm. (40 and 60 in.). In the north-western part of the area in the neighbourhood of the Seychelles it is between about 1,500 and 2,000 mm. (60 and 80 in.). Between latitudes 10° and 30° S. the average annual amount of rainfall shows a gradual decrease southwards; in the eastern portion of the area it decreases to between about 500 and 750 mm. (20 and 30 in.), whilst in the western portion it decreases to about 1,000 mm. (40 in.).

To the east and south-east of the Chagos archipelago from the equator to about Lat. 20° S. although rain occurs in all months of the year it is most frequent in the winter months (June to September). To the west and south-west of the Chagos archipelago and extending southwards to nearly Lat. 30° S. in the extreme west, rain occurs mostly in the mid and late summer months, whilst in the vicinity of the islands of Mauritius and Réunion most rain is experienced in late summer and early autumn. In about the area 10°–20° S., 60°–80° E. to the north and east of Rodriguez island, however, it rains about as often in the winter as it does in the summer; between latitudes 20° and 30° S. rain occurs mostly in the winter (June to September) but even in this area there is a moderate amount of rain in the summer.

From January to March, over practically the whole area, rain occurs on about 50 to 75 per cent of the number of days; from April to June between about longitudes 80° and 90° E., the percentage frequency of days with rain remains at about that amount whereas in the western portion of the area it falls to between about 25 to 50 per cent. From July to September over most of the area about 50 to 75 per cent of the days have rain but in a small area to the east of the Chagos archipelago between about latitudes 5° and 10° S. rain falls on over 75 per cent of the days. In the western portion of the area in the vicinity of the islands of Mauritius and Réunion and also in the neighbourhood of the Seychelles and Amirante islands in the same period about 25 and 50 per cent of the days have rain. From October to December, whilst over most of the area about 25 to 50 per cent of the days have rain, there is an area to the north of the island of Mauritius between latitudes 12° and 18° S. and extending as far east as about the meridian 75° E. where the percentage frequency of days with rain is between about 10 and 25 per cent, also in the area 0°–8° S., 60°–90° E., rain falls on over 75 per cent of the days.

Chagos archipelago.—The data giving the average annual and monthly rainfall together with the maximum fall in 24 hours for the Chagos archipelago are included in the general climatological table on page 63. A step diagram showing the monthly variation in the

rainfall is given in Fig. 22 below. The period of observations is only from 1 to 4 years. There are no records available of the annual and monthly number of days with rain in the archipelago.

The dry season is considered to be from about June to September when the SE. trade is well-established and the wet season when the NW. monsoon is blowing. These wet and dry seasons occasionally however, have been reversed and the SE. trade has brought plenty of rain. Rain falls on most days but on many occasions it may be limited to only a shower; on the other hand droughts of a month's duration have been known. The highest recorded rainfall in the 24 hours is 124 mm. (4.9 in.) and it is considered that this has almost certainly been considerably exceeded at times particularly during the NW. monsoon.

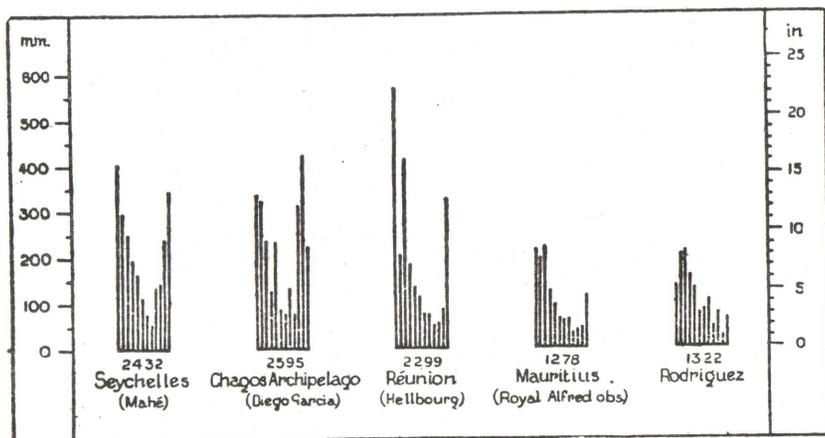


FIG. 22—MONTHLY VARIATION OF RAINFALL

The figures below the step diagrams indicate the total annual amount of rain in millimetres.

Mauritius.—The data giving the annual and monthly rainfall and number of days with rain for this island are included in the general climatological table on page 64. The monthly maximum fall in 24 hours is also given in that table. A step diagram showing the monthly variation in the rainfall is given in Fig. 22 above.

The data given in the climatological table, however, are not applicable to the whole island but only to that part in the immediate vicinity of the Royal Alfred Observatory which is situated in the north-western part of the island in the district of Pamplémousses. A contour map, Fig. 2, of the island is given on page 5 on which are marked the various districts and the position of the observatory.

The rainfall in the island follows the contours very closely and of the different coastal regions in Mauritius the south coast, where the land rises very rapidly to 1,800 feet within 5 miles of the coast, has the most rain with an annual average of about 2,300 mm. (90 in.) which is more than twice as much as that on the west coast

which is the driest and where the annual average is about 900 mm. (35 in.); there is also a small part of the east coast, where the land near the coast rises rapidly, that has a high annual rainfall.

The rainy season is from December to April when about 70 per cent of the total annual amount of rain falls; the remainder of the year is comparatively dry with about 30 per cent of the total annual rainfall, but as the island sometimes comes under the influence of cyclones there is considerable variation in the rainfall from year to year and from one locality to another in the same season, exceptionally heavy falls in short periods being experienced during the cyclone season. From January to March when the frequency of cyclones is about the same in all three months, about 35 to 50 per cent of the total annual amount of rain falls; this is due mostly to cyclones, whilst from June to August, when the SE. trade is blowing almost without interruption, about 10 to 20 per cent of the total annual amount of rain that falls is due to this wind. The proportion of rain brought by the SE. trade decreases with increasing distance from the east coast but it will increase with increasing height, the amount of increase being roughly about 40 mm. (1.5 in.) for every 100 feet of height in the lowest 1,000 feet.

On the whole coast, except for the small region on the south coast, and in the northern plains, September is the driest month, but at about 1,200 feet above sea level the rainfall in October is about the same as that of September and at higher altitudes October becomes the driest month.

At places such as the west coast and the extreme north of the island where there is no orographic effect or where it is of small importance the monthly number of days with rain in the summer (January to March) is much more than in the winter, but in contrast to this in the higher central parts of the island and on its south-eastern slopes the winter months often have the greatest number of rain-days. At Curepipe which is about 2,000 feet above sea level the average number of rain-days in July is 25 whilst on the west coast there are only 2.

Although September and October according to the locality are the driest months, November on the whole is the month with the least number of rain-days and, if rain of purely orographic type is omitted, it will be noticed that there are only 11 or 12 days a month with rain that is caused by disturbances during the summer months.

At the Royal Alfred Observatory the annual variation of rain-days depends on the definition adopted. Days on which 0.1 in. (2.5 mm.) or more of rain fell are most frequent in the summer (December to March), whereas days with a trace or more of rain are as frequent or even more frequent in July and August as in any of the summer months. In order to show this difference the number of days with rain for both definitions is given in the general climatological table on page 64.

Extremes of rainfall.—The monthly and annual extremes of rainfall for the Royal Alfred Observatory are given in the following table:—

MONTHLY AND ANNUAL EXTREMES OF RAINFALL
Period: 1876–1936

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
						<i>millimetres</i>							
Max. ...	847	800	638	409	379	275	203	169	91	173	234	560	2,129
Min. ...	26	24	20	4	5	15	9	3	7	4	4	14	703

Authority.—Bibliography No. 49.

Some years are very much drier than others and in a dry year the rain on the south and east coasts, which are the wettest, may be as low as that usually experienced during an average year on the west coast, which is the driest. In 1886, the driest year on record, Tamarin on the west coast had only 399 mm. (15.7 in.) of rain where the average is 947.6 mm. (37.3 in.), whilst the Royal Alfred Observatory had 755 mm. (29.7 in.) about 508 mm. (20 in.) less than the average amount there. The year 1896 was a very wet year and the rainfall in the wettest parts of the island during that year exceeded 5,080 mm. (200 in.) and Tamarin on the west coast had as much as 1,332 mm. (52.4 in.).

The monthly rainfall in the summer months (January, February or March) may sometimes be very low. In the northern part of the island in January 1907 only 19 mm. (0.75 in.) of rain fell whilst on the west coast only 13 mm. (0.5 in.) were recorded but in the interior of the island the rain in these months has never been less than 32 mm. (1.25 in.). Most of the highest recorded monthly falls of rain have occurred in February but there is one record of a high fall in May 1896 when at Cent Gaulettes as much as 2,140 mm. (84.3 in.) fell.

The monthly extremes of rainfall in the 24 hours at the Royal Alfred Observatory are given in the general climatological table on page 64. Usually at the observatory from July to September the amount of rain does not exceed 40 to 50 mm. (1.5 to 2 in.) a day, but on rare occasions it may be as much as 80 mm. (3 in.). In the summer months the rainfall is heavier and in February 360 mm. (14.2 in.) has fallen in a single day. The maximum rate of fall that has been recorded is 61 mm. (2.4 in.) in 35 minutes.

Diurnal variation of rainfall.—In calm weather rain is much more prevalent during the day especially in the afternoon, but in windy weather when the SE. trade is blowing it is more likely to rain at night.

Reunion.—This island is mountainous and rises in many parts to over 8,000 feet and the highest peak is about 10,000 feet. The observatory is at Hellbourg which is 3,070 feet (approximately) above mean sea level; a contour map of the island is given in Fig. 3 on page 6.

The data giving the average annual and monthly rainfall, the number of days with rain and the maximum fall in 24 hours at the observatory at Hellbourg are included in the general climatological table on page 65, and a step diagram showing the monthly rainfall is given in Fig. 22 on page 49.

The annual and seasonal distribution of the rainfall differs very much in the different parts. The rainy season is from November to April and the maximum amount of rain falls between December and March; the dry season is from May to October with the minimum rainfall occurring in September and October. Rain is not usually heavy or continuous at Réunion and as a mountain chain crosses the island at right angles to the prevailing wind which is south-easterly the west side of the island is the driest and the east side the wettest. At St. Pierre on the SW. coast the average annual rainfall over a period of 11 years is 1,029 mm. (40.5 in.) and at St. Benoit on the NE. coast over a period of 7 years it is 3,886 mm. (153 in.), whilst at Hellbourg during the period of 9 to 11 years it is 2,299 mm. (90.5 in.). The highest recorded rainfalls in the 24 hours that have occurred at Hellbourg were in January and February, and are 108 mm. (4.25 in.) and 105 mm. (4.1 in.) respectively.

The number of rain-days in the year varies from about 92 at St. Pierre to about 244 at St. Benoit, whilst Hellbourg has 151.

Rodriguez.—This island is hilly with but little level land; it also has a central ridge about 1,300 feet high at its highest point.

The data giving the average annual and monthly rainfall, the number of days with rain and the maximum fall in the 24 hours are included in the general climatological table on page 66, and a step diagram showing the monthly rainfall is given in Fig. 22 on page 49.

The wet season is from about January to May, the rain being heaviest in March, but it is not continuous. The dry season is from June to December, and November is the driest month with an average rainfall of only 29 mm. (1.1 in.). In the dry season the water problem on the island may be serious as very many of the streams are absolutely dry in November and December.

Although July is a comparatively dry month with about 86 mm. (3.4 in.) of rain on the average, it has the greatest number of rain-days, namely 23, which indicates that in this month the rainfall is not very intense; in March the amount of rain is as much as 210 mm. (8.3 in.) but it falls on only 20 days. On occasions the rain that has fallen in the 24 hours may be extremely heavy and as much as 404 mm. (15.9 in.) has been recorded in March.

Seychelles.—This is an extensive coral reef consisting of some 29 islands and islets, the observatory from which the data have been obtained is on the island of Mahé. This island is about 17 miles in length and from about 4 to 7 miles wide, the highest peak on it is nearly 3,000 feet high but the observatory is only 15 feet above mean sea level.

The data giving the annual and monthly rainfall, the number of days with rain and the maximum fall in the 24 hours are included in the general climatological table on page 67, and a step diagram showing the monthly rainfall is given in Fig. 22 on page 49.

The average annual rainfall near sea level is about 2,500 mm. (100 in.), but in the hilly districts above 2,000 feet it probably exceeds 3,750 mm. (150 in.).

The wet season is from November to March with most rain falling in December and January when there is an average of 346 mm. (13.6 in.) and 406 mm. (16 in.) respectively. July and August are the driest months, only 56 mm. (2.2 in.) of rain falling on the average in August. After that month there is an increase in rain until in November the increase over that for October is quite considerable, this being due to the squally weather in that month which is accompanied by rain. The average monthly rainfall in the dry season even in the highest parts does not usually exceed 152 mm. (6 in.) and it falls mainly at night. December and January have the greatest number of rain-days in the month with an average of 15 each and August has the least number with an average of 6, which corresponds with the average variation of monthly rainfall.

The maximum amount of rain that has fallen in the 24 hours in any month is in September when 261 mm. (10.3 in.) fell, which is not it should be noted one of the months of the wet season, but January, a wet season month, with 256 mm. (10.1 in.) has had very nearly as much.

The data in the table below which give the extremes of rainfall in the period 1891-1930 are interesting as they show that in September there has been as much as 574 mm. (22.6 in.) of rain during one year whilst in another year there was none at all. The variation in rainfall from one year to another can be very considerable in all months, and from November to March may be as much as between 600 and 700 mm. (23.5 and 27.5 in.) and in most of the other months, except July and August, may be between 400 and 500 mm. (15.7 and 19.7 in.).

MONTHLY AND ANNUAL EXTREMES OF RAINFALL
Period: 1891-1930

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
	<i>millimetres</i>												
Max. ...	798	633	578	435	464	510	282	182	574	384	666	734	3442
Min. ...	87	9	14	20	2	3	8	9	0	1	31	108	1458

Authority.—Bibliography No. 12.

2—HAIL

Hail is very seldom experienced anywhere in the region and the only known reports of hail are from Mauritius and Réunion.

In Mauritius whilst hail has never been recorded at the observatory it has been reported in other parts of the island but only on 6 known occasions in about 80 years. At the island of Réunion also it has been known to fall very occasionally on the coast.

VII—TEMPERATURE

1—AIR TEMPERATURE

The data of the means and extremes of temperature for the Chagos archipelago, Seychelles (Mahé), Mauritius, Réunion and Rodriguez are given in the general climatological tables on pages 63-7. A table giving the mean temperature of the air over the sea in the different 10° areas of the region under consideration is given below.

South Indian ocean.—The mean temperature of the air over the whole region varies very little from east to west but it does vary from north to south. The highest temperatures in midwinter (July) are near the equator, and in midsummer (January) in Lat. 10° S.; the lowest temperatures are in the southern part of the region (Lat. 30° S.) in both seasons. In January the mean temperature on the equator is about 81° F. and in Lat. 10° S. about 82° F., but in Lat. 30° S. it drops to about 73° F.; in July, however, on the equator it is still at 81° F. falling gradually to about 65° F. in Lat. 30° S.

In the extreme south of the region in the vicinity of Lat. 30° S., which may come into the zone of the westerly winds from May to October, the direction of the wind has a good deal to do with the temperature of the air. Winds from a northerly or easterly point in this area are usually relatively warm whilst winds from a southerly or westerly point are usually cold.

The following table gives the mean temperature of the air in the different 10° areas over that part of the South Indian ocean under consideration here. The data have been obtained from ships' observations extending over a number of years.

South Indian ocean.—MEAN TEMPERATURE OF THE AIR OVER THE SEA IN THE DIFFERENT 10° AREAS

Areas	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
	<i>degrees Fahrenheit</i>											
0-10°S.												
50-60° E.	81	81	82	83	81	80	78	77	78	79	80	81
60-70° E.	82	82	82	82	82	80	79	79	80	80	81	80
70-80° E.	81	81	82	82	82	81	80	80	79	80	81	80
80-90° E.	81	81	82	82	82	81	80	80	80	80	80	81
10-20°S.												
55-60° E.	80	81	80	81	79	76	75	74	74	76	77	79
60-70° E.	81	81	81	80	78	76	75	73	74	75	78	79
70-80° E.	80	80	81	80	78	76	74	74	74	76	78	79
80-90° E.	79	80	80	79	78	76	75	75	75	76	77	79
20-30°S.												
55-60° E.	78	78	78	76	73	70	68	68	69	71	73	76
60-70° E.	77	77	77	76	73	69	67	67	67	69	72	75
70-80° E.	76	76	76	74	71	68	65	65	66	67	71	74
80-90° E.	74	75	74	72	70	67	64	64	65	66	69	73

Authority.—Bibliography No. 57.

The greatest range in the monthly averages of temperature between the summer and winter values is in the south where it may be as much as 14° F. whilst in the north between the equator and Lat. 10° S. it may only amount to about 2° F. The daily range of temperature over the sea is quite small, the average being not more than 2° or 3° F.

Chagos archipelago.—The temperature in the archipelago is very uniform throughout the year and seldom exceeds 88° F. or falls below 71° F. There is little seasonal variation but from about June to October, when the SE. trade is blowing, it is usually a little cooler than in the other months of the year. The mean daily range of temperature is between 7° and 8° F. throughout the year.

Mauritius.—The temperature at Mauritius on the whole is not excessive but in December and January at the Royal Alfred Observatory it has reached 95° F. The observatory, however, is only about 175 feet above mean sea level and the temperature will vary considerably at the different heights in the island. Whereas at the observatory the mean annual temperature is about 73° F., at 1,000 feet it is about 70° F. and at 1,800 feet about 68° F., the mean fall of temperature in the island being about 3·3° F. per 1,000 feet; it should not be deduced, however, from this that the fall of temperature in the free air is the same. In 1936 the difference between the mean monthly temperatures at the observatory and the lower temperatures at Vacoas, which is at a height of about 1,400 feet above mean sea level, ranged between 4·3° F. and 6·3° F.

The hottest months in the island are from December to March when the mean temperature at the observatory is about 77° to 79° F.; the other months of the year are comparatively cool, July and August being the coolest with a mean temperature at the observatory of about 68° F., an annual range of between 9° and 11° F. which is small when compared with that of more temperate climates, the corresponding annual range at Richmond (Kew Observatory) in the British Isles being 23° F. The lowest temperatures ever recorded at the observatory are between 50° and 51° F. from June to September, but considerably lower temperatures will be experienced in places at higher altitudes.

The average diurnal variation of temperature is fairly constant throughout the year varying from 12° F. from February to May to 16° F. in October and November. The lowest temperatures at the Royal Alfred Observatory during the day are usually experienced between 0500 and 0600 whilst the highest temperatures generally occur at about 1300.

Réunion.—The observatory on this island is at Hellbourg which is 3,070 feet above mean sea level, the temperatures therefore given in the general climatological table on page 65 for that place are somewhat lower than those that are normally experienced at sea level, and consequently do not give a good indication of the

temperatures likely to be met with in other parts of the island. The eastern coast and the eastern slopes of the hills of the island have a hot damp tropical climate whilst on the western coast and the western slopes of the hills the climate is hot and dry.

The hot season is from December to March when the mean monthly temperature at sea level is between 80° and 82° F.; the coolest month is July with a mean temperature at sea level of 70° F. From about May to October the winds of the SE. trade tend to keep the temperatures from becoming excessive. The highest maximum temperature at sea level is 94° F. in January and the lowest temperature is 59° F. in June, July and August; at Hellbourg the highest and lowest temperature ever recorded is 84° F. in February and 40° F. in August and white frosts have been known to occur at places situated at 3,000 feet and above.

The diurnal variation of temperature is greater at Hellbourg than at sea level. At that place from August to November it is between 18° and 19° F. falling to between 15° and 16° F. during the other months of the year, whilst at sea level it is between 14° and 16° F. throughout the year.

Rodriguez.—The hottest weather occurs in the latter part of January and in February and March when the mean temperature is 80° F.; the highest temperature experienced is 93° F. in March. The coolest weather is in July and August when the mean temperature is 71° F. with a minimum temperature of 59° F. occurring in August. The mean temperatures in each month on the whole are a few degrees higher than those experienced in Mauritius. The temperature is very uniform over the island throughout the year and there is a mean range of only 9° F. between the highest and the lowest average monthly temperatures during the year; the mean diurnal variation of temperature is about 11° F. Both the annual and diurnal range of temperature are about 2° F. less than that at Mauritius.

Seychelles (Mahé).—The highest temperatures at these islands are experienced in March, April and May, and in April the mean temperature is 82° F.; the lowest mean temperatures occur in July and August when they are 78° F. It will be seen therefore that the temperature is very uniform throughout the year. The maximum temperature in March, April and May as a rule does not exceed 89° F. and the minimum temperature in the cooler months does not fall below 68° F. The mean daily range of temperature is about 6° F. Throughout the greater part of the year there are usually pleasant sea breezes to alleviate the heat but the weather can be close and unpleasant in December and January.

2—SEA TEMPERATURE

The position of the 70° and 80° F. isotherms for the sea surface temperature, in the different months of the year, is shown on the

monthly surface wind charts of Figs. 4 to 15 on pages 18-29. There is a fairly regular annual variation in the sea surface temperature; the maximum temperatures on the equator occur in April, and to the south of about Lat. 18° S. in February and March, whilst the minimum sea temperatures over the whole region occur in August and September.

On the charts for January, February and March the 80° F. line only is shown, as these are summer months and the 70° F. line is then south of Lat. 30° S. In the areas where the sea surface temperature is over 80° F. it nowhere exceeds 85° F. and only just reaches that value in a few small areas near the equator in April. In the extreme south of the region in the vicinity of Lat. 30° S. in August and September the sea surface temperature may fall as low as 61° or 62° F. in the eastern part of the area, but the mean sea temperature does not usually fall below 60° F. anywhere north of Lat. 30° S., and the sea temperatures in this region are nearly always slightly lower in the east of the area than they are in the west throughout the year.

The isotherms of the sea surface temperature run roughly east and west, the highest sea temperatures being in the north and the lowest in the south; it will be noticed, however, that the lower sea temperatures are found in latitudes some 5° or 6° nearer the equator in the eastern part of the region than in the western part, especially in the months from January to April, but this does not hold good in all areas throughout the year owing to the ocean currents.

In those areas of the South Indian ocean where the SE. trade is to be met with an ocean current with a westerly drift is set up; this SE. trade blows with the greatest intensity over the region under consideration from May to October. The westerly current is therefore strongest in those months. This westerly ocean current on reaching a point somewhere between the 50th and 60th meridians divides into two streams, one proceeding north of Madagascar and the other south of it. The northern stream flows north-westwards to the African coast and then north along that coast. The water of this westerly current is slightly cooler than that to the north of it near the equator, and slightly warmer than that to the south of it between about latitudes 20° and 30° S. where in both those areas the ocean is unaffected by this westerly drift.

The effect of this westerly current can be seen in the charts from June to October (Figs. 9 to 13, pages 23-7) where the isotherm for 80° F. curves away more to the northward in the west of the area than in the east.

3—RELATIVE VALUES OF SEA AND AIR TEMPERATURE

The difference between the temperature of the surface of the sea and that of the air is comparatively small at all times of the year and only varies between about 1° and 3° F., the sea being slightly warmer than the air over practically the whole region throughout the year.

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In July, a winter month in the southern hemisphere, the air is colder than the water over nearly the whole region, the difference between the two temperatures in the south-eastern area being about 3° F., whilst in the vicinity of the islands of Mauritius and Réunion it is about 2° F. To the south of the Seychelles there is a small area, however, where the air is slightly warmer than the sea, but the difference in temperature is less than 2° F.

In January, which is in the summer in the southern hemisphere, in the area between the equator and Lat. 10° S. the air is also colder than the water but by not more than about 1.5° F.; further south, however, the differences in temperature are more irregular and in an area in the extreme south-west of the region the air tends to be slightly warmer than the sea.

VIII—HUMIDITY

The data giving the mean monthly relative humidity, where possible for two hours of the day separately, for the Chagos archipelago, Mauritius, Réunion (Hellbourg, 3,070 feet above M.S.L.), Rodriguez, and Seychelles (Mahé), are included in the general climatological tables on pages 63-7. For Mauritius, Rodriguez and the Seychelles the wet bulb temperatures for two hours of the day are also given in those tables.

South Indian ocean.—The mean relative humidity over that part of the South Indian ocean under consideration here is fairly high throughout the year, and shows comparatively little seasonal variation. It is lowest in the south in the vicinity of Lat. 30° S. and highest near the equator.

In midwinter (July) the mean relative humidity does not exceed 85 per cent anywhere in the region, and between the equator and about Lat. 20° S. it lies between about 80 and 85 per cent, whilst to the south of Lat. 20° S. it is between about 70 and 80 per cent. In midsummer (January) it is over 85 per cent at the equator and this comparatively high mean relative humidity extends southwards to about Lat. 15° S.; the mean relative humidity in about Lat. 30° S. is between about 70 and 80 per cent and this extends further to the north at this time of the year in the eastern portion of the area than it does in the west, and there is an intermediate area where the mean relative humidity is between about 80 and 85 per cent lying roughly between the parallels 15° and 18° S. in Long. 90° E. and between about the parallels 10° and 30° S. in Long. 45° E.

Islands of the South Indian ocean.—The only island for which detailed information is available is Mauritius; for the remaining islands there is very little information other than that given in the general climatological tables.

In the Chagos archipelago the relative humidity is reported to be generally rather high and from October to March, the warm season, the heat coupled with this high humidity is said to be very trying for Europeans. In the Seychelles, during the NW. monsoon, which is the wet season, from November or December to March or April

the humidity is reported to be high and especially is this so in December and January.

At the island of Réunion the relative humidity given in the general climatological table on page 65 is for the observatory at Hellbourg, which is 3,070 feet above mean sea level; these readings are much higher than those at sea level, and the relative humidity at Port des Galets at a height of 44 feet above mean sea level on the north-west or lee side of the island at 0700 throughout the year is about 15 to 20 per cent less than that at Hellbourg at the same hour; it is probable, however, that on the south and east side of the island this difference will be less. It is also considered that the observations at Hellbourg at 1600 are probably much higher than those near sea level at the same hour of the day owing to the cloud amount there in the afternoon showing a considerable increase over that of the morning.

Mauritius.—At Mauritius during the trade wind season the south and south-east of the island and the eastern slopes of the hills are the wettest and the low-lying parts on the lee side of the island in the west and north-west are the driest as the wind has lost most of its humidity on the south and east of the island. The annual variation in humidity is therefore very different on the eastern part of the island from that on the western which lies below the central tableland.

It is noticeable that the seasonal variation in humidity follows closely the variation in the rainfall, the mean relative humidity at the Royal Alfred Observatory in the north-west of the island has a maximum of about 80 per cent in March, when there is the most rain and a minimum of about 70 per cent in November, when the frequency and duration of the rainfall are least, although September has the smallest amount of rain. The mean relative humidity for the whole year at the observatory is 75 per cent, 30 per cent being the extreme minimum recorded. In the region, however, lying along the north-west to the west coast, almost at sea level, it is very dry indeed and the humidity here will probably fall much lower than the minimum recorded at the observatory. The range in the monthly means at the observatory is only about 11 per cent. As at Réunion there is a marked increase in relative humidity with increasing altitude; at the observatory which is about 175 feet above mean sea level the mean annual relative humidity is 75 per cent, at Vacoas, about 1,400 feet above mean sea level it is 80 per cent, whilst at Curepipe at an altitude of 1,850 feet it is 87 per cent. The following table shows the excess in the mean relative humidity at Vacoas over that at the Royal Alfred Observatory during the different months of the year from observations taken at 1000:—

EXCESS OF RELATIVE HUMIDITY (%) AT VACOAS (1,400 FT.) OVER THAT AT THE ROYAL ALFRED OBSERVATORY (175 FT.)

Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
9	5	5	8	8	9	11	13	14	12	12	9

Authority.—Bibliography No. 18.

From the above table it can be seen that the smallest excesses occur in February and March which are about the two wettest months and the largest from August to November, the driest time of the year.

Diurnal variation.—The time of occurrence of the maximum and minimum humidity is very constant throughout the year. The maximum is reached just before sunrise and the minimum occurs invariably at 1300. The diurnal range which varies between about 20 and 30 per cent is smallest in April, when the diurnal range of the air temperature is also smallest, and is highest in October and November, which is the driest time of the year.

The figures for 0700 and 1300 in the general climatological table give a general idea of the diurnal range in the winter months but not in the summer. The data for 1300 correspond closely with the minimum values of the day in all months of the year, but those for 0700 correspond with the maximum values only in the months from March to August, in the other months they are lower than the maximum by values ranging from 3 per cent in February and September to 11 per cent in November.

Wet bulb temperature.—The average wet bulb temperature at Mauritius is as a rule below 78° F., which is the temperature above which continuous hard labour is regarded as impracticable. In the hottest months, however, the mean value at midday is only 1° or 2° F. below that limit, and it may be surpassed on individual days.

The minimum wet bulb temperatures occur between 0400 and 0600 and the maximum shortly after noon. The range in the average hourly values is between 4° and 5° F. in all months of the year.

On the average the wet bulb temperature is highest in February, when it varies from 72° F. in the early morning to over 76° F. at midday; it is lowest in July and August, when the corresponding temperatures are 61° and 65° F.

IX—MISCELLANEOUS

1—THUNDERSTORMS

The data of the average number of thunderstorms in the year and in the different months for Mauritius and Seychelles are given in the general climatological tables on pages 64 and 67. The data refer to thunderstorms; if the figures for thunder heard were given then they would be much larger. There are, unfortunately, no similar data available for the other islands in that part of the South Indian ocean under consideration here.

There is very little information about thunderstorms over the open sea of the South Indian ocean; the annual percentage frequency of the number of days with thunder at the equator is about 5 per cent, i.e. about 20 storms a year, and this shows a decrease southwards to between about 1 and 3 per cent in about latitudes 15° to

30° S.; this frequency also shows a slight increase from west to east. The months from October to March have a slight increase in frequency over those from April to September, whilst between about latitudes 25° and 30° S. thunderstorms are probably very rare at any time of the year.

Tropical cyclones, particularly those with weak systems, are not infrequently accompanied by thunderstorms and in the equatorial regions, especially in June, when the weather is cloudy with rain-squalls, they may be experienced. Over the sea the time when thunderstorms are most likely to occur is between midnight and 0400.

In the Seychelles the months with the maximum frequency of thunderstorms are from December to May when there may be 2 or 3 a month; during the other months of the year thunderstorms do not often occur. At Réunion thunderstorms are reported to be rare, but when one does occur it is almost always during the months from November to April, and there may be on the average about 10 storms in a year at the island.

At Mauritius thunderstorms are most frequent from November to May with a maximum in March, and although they have occasionally occurred in September and October they are practically unknown in June, July and August. Thunder is most frequent during the period of heaviest rainfall, January to March; there are on the average 4 days when thunder has been heard in January and February and 5 in March. The most violent storms in the islands are those which form on the outskirts of tropical cyclones; they are, however, of short duration and pass away with the cyclone. Another type of weather in which storms are experienced is that which accompanies a weak or ill-defined depression, whilst others may arise from local instability conditions in the summer months (December to March) when light, warm, conflicting winds of equatorial origin are blowing; this may cause thundery weather and in consequence such storms may occur daily until these conditions have changed; they sometimes last for 2 or 3 days and on one extremely rare occasion there were 13 consecutive days with thunder and lightning.

2—SEA AND SWELL

Tables for a 10-year period giving the sea and swell in relation to the wind direction at Mauritius are reproduced on page 103. The table giving the data for sea is for 0700 (local time) and the observations have been made from Grand Bay on the north coast, Black river on the west coast and Port Souillac on the south coast; those for swell were made at 1000 (local time) from Caves point lighthouse (20° 11' S., 57° 25' E.) near Port Louis.

The SE. trade wind will cause an ocean swell to get up and the coasts and harbours of those islands which are exposed to this wind will also experience a heavy swell when it is blowing.

At the islands of Réunion, Mauritius and Rodriguez rollers that rise to a great height and break violently on the coasts are sometimes experienced. At Réunion these rollers, called by the inhabitants *Ruz de Marée*, are an extraordinary phenomenon and it is said that at certain seasons and under certain barometric conditions they precede a tropical cyclone by some days, and rollers setting in heavily from Saint Pierre to Saint Benoit and advancing from place to place until they arrive at Saint Denis are an almost certain sign of an approaching cyclone. Rollers may also occur at Réunion at certain intervals in fine and calm weather unaccompanied by any barometric changes or other indication. They are then probably related to the passage of cyclones very far away as they are felt most during the months from April to November when storms are experienced far to the south of the island and in the latitude of the Cape of Good Hope.

3—WATERSPOUTS

There are very few observations of waterspouts in the South Indian ocean so it is not possible to give an accurate estimate of the frequency of their occurrence, but from the few that have been obtained it is probable that they are most likely to occur in March and April and least likely in September and December.

During the period 1920–31, two waterspouts were reported by ships in the 10 degree area 0°–10° S., 70°–80° E., six in the area 0°–10° S., 80°–90° E. and one in the area 10°–20° S., 80°–90° E. No waterspouts have been reported from any of the islands or from any of the other open sea areas of the South Indian ocean under consideration here; from this, however, it should not be inferred that they never occur as it is possible that, owing to the scarcity of shipping, many that take place pass unrecorded.

TABLE I—GENERAL CLIMATOLOGICAL TABLES

Chagos archipelago (Diego Garcia). 7° 14' S., 72° 26' E. Height unknown.

Times of obs. : 0900 and 1500.

Month	Pressure at M.S.L.		Air Temperature						Rain				Thunder	Gales	Speed in knots §	Wind										Poor visibility	Relative humidity %	Cloud amount	Wet bulb temperature °F.
	Average ††	Daily range	Average *	Mean of		Mean of		Extreme		Average fall	No. of days	Max. fall in 24 hours				Percentage of observations from													
				Daily max.	Daily min.	Highest	Lowest	Highest	Lowest							N.	NE.	E.	SE.	S.	SW.	W.	NW.	Calm					
															Observations at 0900 and 1500														
January ..	1013	mb.	82	85	77	°F.	°F.	87	74	339	13.3	mm.	in.	121	4.8	No. of days	4	12	9	6	19	4	6	12	30	2		79	5.3
February ..	1013		81	85	76			86	72	323	12.7			78	3.1		4	9	8	12	5	2	8	22	43	1		83	6.4
March ..	1013	Data not available	82	85	78	Data not available	Data not available	88	74	239	9.4	Data not available		89	3.5		4	7	9	6	15	3	6	14	39	1		80	5.3
April ..	1013		83	86	78			87	75	129	5.1			55	2.1		4	2	6	11	39	7	6	12	15	2		77	4.4
May ..	1012		82	85	78			87	75	232	9.1			97	3.8		4	1	8	11	52	11	4	0	8	5		75	5.4
June ..	1015	Data not available	80	83	76	Data not available	Data not available	85	72	87	3.4			110	4.3		5	1	1	9	63	19	4	1	0	2		77	4.3
July ..	1015	Data not available	79	82	76	Data not available	Data not available	85	73	78	3.1			54	2.1		7	2	3	8	63	16	3	1	3	1		80	5.1
August ..	1015		79	82	75			84	72	133	5.2			103	4.1		5	2	2	6	69	15	3	1	2	0		78	5.0
September ..	1015	Data not available	81	83	76	Data not available	Data not available	85	71	78	3.1			17	0.7		3	3	1	2	10	61	14	4	4	4		76	4.0
October ..	1013		80	83	77			86	75	315	12.4			114	4.5		3	2	9	17	41	20	4	1	3	3		81	5.7
November ..	1014		81	84	77			86	74	421	16.6			124	4.9		3	5	10	21	49	11	2	1	1	0		79	6.7
December ..	1012		—	—	—			—	—	221	8.7			51	2.0		4	2	48	5	34	9	0	0	0	2		—	5.7
Year ..	1014									2595	102.1			124	4.9		4	4	10	9	42	11	4	6	12	2			5.3

Authorities.—Bibliography Nos. 1, 52.

Notes.—†† Interpolated from charts.

* Mean of observations at 0900 and 1500.

§ Mean of 24 hours.

Periods.—Temperature and humidity, 1-2 years.

Rain, wind-direction and cloud-amount, 1-4 years.

Wind-speed, 1-3 years.

The period covered by the observations is July-Nov. 1907,

Jan.-Aug. 1908 and Jan. 1911-Aug. 1912.

Table I—General Climatological Tables

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TABLE I—continued

Mauritius (Royal Alfred Observatory).

20° 06' S., 57° 32' E. 181 ft.

Times of obs. : Hourly.

Month	Pressure at M.S.L.		Air Temperature								Rain				Thunderstorm		Wind										Fog %	Relative humidity %	Cloud amount	Wet bulb temperature F.			
	Average ††	Daily range †	Average ††	Mean of		Mean of		Extreme		Average fall	No. of days	Max. fall in 24 hours	Thunderstorm	Gales †	Speed in knots ††	Percentage of observations from																	
				Daily max.	Daily min.	Highest	Lowest	Highest	Lowest							N.	NE.	E.	SE.	S.	SW.	W.	NW.	Calm ††									
January ..	1012	2.4	79	86	73	89	68	95	63	215	8.5	19	12	175	6.9	0.4	0.1	7	7	Observations at 0300, 0900, 1500 and 2100										0700 (Z-4)			
February ..	1011	2.3	78	85	73	88	68	91	64	197	7.8	18	11	360	14.2	0.5	0.2	7	6	7	12	44	25	2	2	4	4	0	0.7	86	6.0	74	
March ..	1012	2.3	78	84	72	87	67	90	63	220	8.7	21	11	194	7.6	0.7	0.1	6	3	7	40	40	3	2	2	3	0	0.9	90	5.4	73		
April ..	1014	2.4	76	82	70	85	64	88	58	126	5.0	18	9	124	4.9	0.5	0.1	6	1	5	41	44	4	3	1	1	0	0.4	89	5.5	70		
May ..	1016	2.4	71	79	66	82	59	85	55	95	3.8	15	7	207	8.1	0.1	0.1	6	1	2	31	57	5	2	2	0	0	0.5	83	5.2	66		
June ..	1019	2.4	69	76	63	79	56	83	51	65	2.6	16	6	151	5.9	0	0	7	0	2	30	62	4	1	1	0	0	0.3	87	5.2	62		
July ..	1021	2.5	68	75	62	77	56	80	51	60	2.3	20	6	76	3.0	0	0	7	1	2	31	60	4	1	1	0	0	0.4	85	5.5	61		
August ..	1021	2.5	68	75	62	78	55	80	50	63	2.5	20	6	81	3.2	0	0	8	0	2	30	61	5	0	1	1	0	0	0	85	5.6	61	
September ..	1020	2.6	69	77	63	80	57	83	51	35	1.4	15	4	48	1.9	0.1	0	7	0	3	39	53	3	0	1	1	0	0.3	83	5.8	63		
October ..	1018	2.5	72	80	64	84	59	88	55	40	1.6	14	4	141	5.5	0.1	0	7	2	7	38	45	3	2	2	1	0	0.1	80	5.2	66		
November ..	1016	2.5	75	83	67	88	61	91	57	45	1.8	12	4	127	5.0	0.1	0	7	3	10	51	27	2	1	3	3	0	0.1	77	5.6	69		
December ..	1014	2.4	77	85	71	90	66	95	62	116	4.6	16	7	90	3.5	0.2	0.1	7	4	13	48	27	2	2	2	2	0	0.5	81	5.6	72		
Year ..	1016	2.4	73	81	67	91	54	95	50	1278	50.6	204	87	360	14.2	3	0.6	7	2	6	38	44	4	2	2	2	0	5	85	5.5	68		

Authorities.—Bibliography Nos. 18, 49, 55.

Periods.—Pressure, 56 years. Temperature, 40 years; (average), 55 years.
 Rain (average and max. fall in 24 hours), 43 years;
 No. of days, 1894-1936.
 Thunder, 73 years. Gales, 59 years. Wind (speed),
 55 years; (direction), 1930-37. Fog, 7-9 years.
 Humidity and wet bulb temperature, 1891-1935.
 Cloud, 1917-36.

Notes.—†† Mean of 24 hours.
 † Difference between highest and lowest hourly means.
 ‡ Day with trace or more of rain.
 § Day with 2.5 mm. (.1 in.) or more of rain.
 † Beaufort force 8 or more.
 ‡† Owing to the correction adopted for the anemometer at low speeds no calms are recorded.
 § No. of days with visibility less than ½ nautical mile at 0900-1000 (Z-4).

Month	Observations at 1200 (Z-4)										1300 (Z-4)					
January ..	Data for four hours of observation separately are given in Table III										Data not available					
February ..																
March ..																
April ..																
May ..																
June ..																
July ..														67	7.2	76
August ..														71	7.1	76
September ..														72	7.0	76
October ..														71	6.7	74
November ..														68	6.2	70
December ..														65	5.9	67
Year ..	64	6.5	71													

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South Indian Ocean

TABLE I—continued

Seychelles (Mahé). 4° 37' S., 55° 27' E. 15 ft.

Times of obs.: 1000 and 1600 local time.

Month	Pressure at M.S.L.		Air Temperature						Rain			Thunderstorm	Gales	Wind										Poor visibility †	Relative humidity %	Cloud amount	Wet bulb temperature °F.			
	Average ††	Daily range	Average*	Mean of		Mean of		Extreme	Average fall	No. of days ‡	Max. fall in 24 hours			Percentage of observations from																
				Daily max.	Daily min.	Highest	Lowest							Highest	Lowest	N.	NE.	E.	SE.	S.	SW.	W.	NW.					Calm		
	mb.	mb.	°F.	°F.	°F.	°F.	°F.	°F.	mm.	in.		mm.	in.	No. of days	Speed in knots ††	Observations at 1000 local time														
January ..	1012		80	83	77	85	74	87	70	406	16.0	15	256	10.1	3	4	10	11	6	2	0	2	12	44	13	0.5	80	6.7	76	
February ..	1011		81	84	77	86	74	87	71	297	11.7	10	215	8.5	3	4	17	20	7	2	1	0.7	8	36	8	0	78	6.3	77	
March ..	1011		81	85	78	87	75	89	69	250	9.8	11	154	6.1	3	4	12	18	8	4	1	0.3	10	38	8	0	76	5.8	77	
April ..	1011		82	85	78	88	76	89	72	196	7.7	10	90	3.5	2	3	7	17	23	13	3	1	5	19	12	1	75	5.2	78	
May ..	1011		81	85	78	87	75	89	69	165	6.5	9	113	4.4	2	6	2	3	35	33	10	4	1	5	7	1	76	5.4	77	
June ..	1012		79	82	77	84	73	87	68	114	4.5	8	114	4.5	0.9	8	0.3	3	28	44	17	5	0	0.7	2	0.5	77	6.1	76	
July ..	1013	Data not available	78	81	75	82	73	85	68	78	3.1	7	68	2.7	0.4	10	2	3	29	50	12	2	0.6	1	0.6	1	78	6.1	74	
August ..	1013		78	81	76	82	73	84	70	56	2.2	6	62	2.4	0.1	10	3	3	28	52	9	1	0.3	1	2	0	76	6.1	74	
September ..	1013		79	82	76	83	72	85	68	137	5.4	8	261	10.3	0.7	9	3	4	31	48	8	2	0	1	3	0	76	6.0	75	
October ..	1013		79	83	76	85	73	86	69	146	5.7	8	140	5.5	0.4	6	4	9	32	31	12	2	0.7	2	7	0	76	5.8	75	
November ..	1012		79	83	76	85	73	86	68	240	9.4	12	131	5.2	0.5	4	6	10	23	13	8	2	3	17	18	0.5	76	5.7	76	
December ..	1012		79	83	76	85	73	87	69	346	13.6	15	155	6.1	3	4	6	10	12	7	3	3	7	36	16	1.5	79	6.4	76	
Year ..	1012		80	83	77	—	—	89	68	2432	95.6	121	261	10.3	20	6	6	9	22	25	7	2	4	17	8	6	77	6.0	76	
																Observations at 1600 local time														
Authority.—Bibliography Nos. 1, 52, 56, 57.																														
Periods.—Pressure and temperature, 27 years.																														
Rain (average fall and no. of days) periods ending in 1936; (max. fall in 24 hrs.), 30 years.																														
No. of days with thunder, 1909–19.																														
Wind (speed), 1915–35; (direction), 1926–35.																														
Poor visibility, 2 years.																														
Humidity, cloud amount and wet bulb temperature, 1911–35.																														
Notes.—†† Mean of 24 hours.																														
* † (max. + min.).																														
‡ Day with 2.5 mm. (0.1 in.) or more of rain.																														
¶ No. of days with visibility less than 2 nautical miles.																														
Month																														
January ..																														
February ..																														
March ..																														
April ..																														
May ..																														
June ..																														
July ..																														
August ..																														
September ..																														
October ..																														
November ..																														
December ..																														
Year ..																														

Table I—General Climatological Tables

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TABLE II—MONTHLY FREQUENCY OF WIND DIRECTION AND FORCE AT SEA

Number of occasions per 100 on which particular winds may be expected

I = Beaufort force 1-3. II = force 4-7. III = force 8-12

0°-5° S., 45°-50° E.

Month	N.			NE.			E.			SE.			S.			SW.			W.			NW.			Calm	Totals of			No. of obs.
	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III		I	II	III	
January	26	14	0	27	14	0	4	2	0	0	0	0	0	0	0	0	0	0	2	.4	0	6	3	0	.9	66	33	0	114
February	15	2	0	49	7	0	21	6	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	84	16	0	44
March ..	14	0	0	14	2	0	33	0	0	16	0	0	6	0	0	8	0	0	1	0	0	-6	0	0	6	92	2	0	83
April ..	4	0	0	1	0	0	7	0	0	25	0	0	19	0	0	24	0	0	8	0	0	4	0	0	9	91	0	0	82
May ..	0	0	0	0	0	0	.7	0	0	19	5	0	35	11	0	19	2	0	3	0	0	0	0	0	6	76	18	0	72
June ..	0	0	0	0	0	0	1	7	0	3	18	0	1	27	0	3	34	0	0	6	0	0	0	0	0	9	91	0	34
July ..	0	0	0	0	0	0	7	0	0	46	0	0	24	4	0	2	17	0	0	0	0	0	0	0	0	78	22	0	23
August ..	0	0	0	0	0	0	3	1	0	10	37	2	9	33	.8	0	3	0	0	0	0	0	0	0	0	22	75	3	68
September	0	0	0	0	0	0	0	4	0	23	17	0	28	25	0	-7	2	0	0	0	0	0	0	0	0	52	48	0	73
October	0	0	0	0	0	0	8	1	0	38	13	0	25	6	0	5	0	0	0	0	0	0	0	0	4	76	20	0	49
November	11	1	0	7	1	0	19	0	0	6	5	0	8	3	0	7	.7	0	14	2	0	4	0	0	10	76	14	0	68
December	4	3	0	28	17	0	16	0	0	3	0	0	0	0	0	0	0	0	8	0	0	11	.8	0	9	70	21	0	57

0°-5° S., 50°-55° E.

January	29	16	0	30	2	0	7	0	0	2	.7	0	0	0	0	0	0	0	0	0	-4	0	0	9	2	0	2	77	21	0	127
February	32	7	0	34	3	0	8	0	0	1	0	0	0	0	0	0	0	0	5	0	0	8	0	0	2	88	10	0	81		
March ..	16	0	0	14	.3	0	23	.9	0	8	1	0	3	.4	0	2	0	0	12	1	0	15	.7	0	3	92	5	0	157		
April ..	3	0	0	5	0	0	13	.4	0	12	.5	0	3	.9	0	16	.9	0	22	2	0	6	0	0	15	80	5	0	112		
May ..	-9	0	0	-9	0	0	2	.8	0	16	26	0	22	15	0	5	4	0	0	0	0	3	0	0	4	50	46	0	113		
June ..	0	0	0	0	0	0	6	7	0	19	22	0	10	16	0	5	9	0	2	2	0	-5	.5	0	0	44	56	0	110		
July ..	0	0	0	0	0	0	4	2	0	22	34	0	22	11	0	5	.6	0	0	0	0	0	0	0	0	53	47	0	93		
August ..	0	0	0	0	0	0	0	.3	0	18	20	0	17	28	0	7	8	0	-4	.4	0	0	0	0	0	43	57	0	145		
September	0	0	0	0	0	0	-9	.6	0	24	23	0	24	22	0	4	1	0	0	0	0	0	0	0	0	54	46	0	168		
October	0	0	0	0	0	0	6	3	0	31	14	0	22	4	0	13	.4	0	4	0	0	2	0	0	2	77	21	0	140		
November	5	1	0	5	.8	0	16	2	0	28	0	0	8	0	0	3	1	0	13	5	0	8	1	0	2	86	12	0	130		
December	4	0	0	29	3	0	14	0	0	8	0	0	1	0	0	7	0	0	9	.5	0	7	2	0	16	79	5	0	90		

.Authorities.—Bibliography Nos. 2 and 57.

TABLE II—continued

Number of occasions per 100 on which particular winds may be expected

I = Beaufort force 1-3. II = force 4-7. III = force 8-12

0°-5° S., 55°-60° E.

Month	N.			NE.			E.			SE.			S.			SW.			W.			NW.			Calm	Totals of			No. of obs.
	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III		I	II	III	
January	35	3	0	19	2	0	-5	-9	0	1	0	0	-5	0	0	4	0	0	5	-9	0	13	1	0	13	79	8	0	106
February	26	9	0	30	3	0	9	-4	0	2	0	0	2	-8	0	-4	0	0	1	0	0	11	2	0	2	83	15	0	128
March ..	17	-6	0	18	-2	0	7	-3	0	7	0	0	3	0	0	3	-5	0	7	2	0	17	1	0	14	81	5	0	187
April ..	3	0	0	1	0	0	2	0	0	10	0	0	5	0	0	21	3	0	23	4	0	3	0	0	23	70	7	0	73
May ..	-9	0	0	2	0	0	6	2	0	26	5	0	25	8	0	7	4	0	-9	2	0	1	-6	0	8	70	22	0	166
June ..	-6	-4	0	2	0	0	2	2	0	25	10	0	25	7	0	13	6	0	3	1	0	-8	-3	0	1	72	27	0	260
July ..	0	0	0	0	0	0	1	-3	0	17	26	0	15	26	0	8	4	0	1	0	0	0	0	0	-8	43	56	0	134
August ..	0	0	0	-8	0	0	5	4	0	26	20	0	17	18	0	4	3	0	1	0	0	0	0	0	-8	54	45	0	236
September	0	0	0	2	-5	0	12	6	0	28	17	0	14	11	0	4	3	0	-4	2	0	0	-2	0	-4	60	39	0	278
October	-4	0	0	3	0	0	7	2	0	25	6	0	21	4	0	13	2	0	5	0	0	4	0	0	8	78	14	0	137
November	2	0	0	7	0	0	5	1	0	26	2	0	15	1	0	16	0	0	11	-8	0	4	-9	0	8	86	6	0	119
December	12	-4	0	8	-6	0	11	2	0	5	-6	0	4	-4	0	8	0	0	5	1	0	25	3	0	14	78	8	0	147

0°-5° S., 60°-65° E.

January	27	4	0	18	-7	0	3	-8	0	0	0	0	0	0	0	14	0	0	11	1	0	16	4	0	0	89	11	0	70
February	15	13	0	30	7	0	7	-4	0	-9	0	0	0	0	0	0	0	0	7	-8	0	9	7	0	3	69	28	0	115
March ..	16	6	0	20	0	0	2	0	0	0	0	0	5	0	0	3	0	0	11	1	0	15	0	0	21	72	7	0	70
April ..	6	2	0	9	-4	0	9	2	0	4	-7	0	5	-4	0	8	-3	0	17	4	0	12	6	0	10	71	19	0	139
May ..	5	0	0	4	0	0	8	5	0	18	4	0	10	1	0	10	5	0	9	4	0	6	2	0	10	70	20	0	176
June ..	1	0	0	4	0	0	11	3	0	17	11	0	22	9	0	10	3	0	3	0	0	2	0	0	4	70	26	0	162
July ..	0	0	0	1	0	0	3	-4	0	23	20	0	17	26	0	0	5	0	2	-9	0	-9	0	0	-8	47	52	0	120
August ..	-4	0	0	1	0	0	8	4	0	16	11	0	20	18	0	11	4	0	5	0	0	-3	0	0	1	62	37	0	145
September	8	0	0	5	0	0	20	2	0	25	9	0	10	4	0	4	-3	0	5	0	0	2	0	0	5	79	16	0	188
October	5	0	0	4	-3	0	5	1	0	14	3	0	16	1	0	14	5	0	2	-6	0	3	0	0	25	64	11	0	187
November	7	2	0	2	0	0	8	-4	0	15	-4	0	13	0	0	6	-8	0	16	3	0	9	3	0	13	77	10	0	126
December	13	3	0	6	2	0	7	-8	0	2	0	0	-4	-4	0	12	4	0	15	5	0	15	6	0	8	71	21	0	123

Authorities.—Bibliography Nos. 2 and 57.

Table I—Wind direction and force at sea

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TABLE II—continued

Number of occasions per 100 on which particular winds may be expected

I = Beaufort force 1-3. II = force 4-7. III = force 8-12

0°-5° S., 65°-70° E.

Month	N.			NE.			E.			SE.			S.			SW.			W.			NW.			Calm	Totals of			No. of obs.
	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III		I	II	III	
January	15	8	0	6	0	0	3	0	0	-3	0	0	-4	0	0	1	-3	0	13	1	0	18	27	0	6	58	36	0	137
February	20	11	0	22	8	0	5	-3	0	-7	0	0	2	0	0	-2	0	0	5	2	0	15	7	0	2	70	28	0	219
March ..	23	4	0	15	-8	0	9	0	0	4	0	0	8	0	0	4	-4	0	9	2	0	12	2	0	6	85	9	0	126
April ..	8	2	0	-9	-3	0	3	0	0	7	0	0	10	0	0	11	3	2	16	8	1	15	9	0	4	70	22	4	172
May ..	0	3	0	0	0	0	6	0	0	11	3	0	15	1	0	23	6	0	8	7	0	2	5	0	11	65	24	0	96
June ..	0	0	0	0	-7	0	9	3	0	17	15	0	25	9	0	8	3	0	3	0	0	4	0	0	4	66	30	0	142
July ..	-4	0	0	0	0	0	6	2	0	24	11	0	14	23	0	6	2	0	6	0	0	2	0	0	4	58	38	0	143
August ..	1	0	0	5	0	0	12	2	0	18	10	0	18	9	0	8	0	-3	6	1	-4	3	2	0	3	73	23	1	133
September	8	0	0	4	-7	0	16	5	0	19	2	0	11	5	0	7	-7	0	4	-3	0	7	-4	0	12	73	15	0	138
October	1	0	0	1	0	0	4	-6	0	13	5	0	21	4	0	15	3	0	13	3	0	5	3	0	9	73	18	0	246
November	3	1	0	3	-5	0	3	10	0	3	2	0	5	2	0	7	3	0	16	4	0	15	9	0	13	55	32	0	198
December	9	7	0	5	1	0	-8	-4	0	4	-5	0	3	1	0	10	-7	0	20	7	0	15	12	0	4	67	29	0	209

0°-5° S., 70°-75° E.

January	10	15	0	12	2	0	2	0	0	1	0	0	-9	0	0	2	0	0	10	4	0	15	21	0	4	53	43	0	107
February	19	21	0	15	9	0	10	0	0	-9	0	0	0	0	0	0	0	0	-4	0	0	18	1	0	5	63	32	0	113
March ..	31	3	0	12	0	0	-5	0	0	4	0	0	3	0	0	7	-5	0	7	2	0	21	5	0	3	86	11	0	101
April ..	5	-7	0	5	0	0	10	0	0	13	1	0	8	-7	0	4	8	0	6	9	0	8	10	0	10	60	30	0	72
May ..	-7	-7	0	0	0	0	0	0	0	17	7	0	14	7	0	12	2	0	18	7	0	4	1	0	8	66	26	0	73
June ..	1	-3	0	2	0	0	5	2	0	14	13	0	22	8	0	12	4	0	6	2	0	-8	2	0	5	63	32	0	186
July ..	-2	0	0	-9	0	0	3	-5	0	16	12	0	22	8	0	16	5	0	5	1	0	4	-3	0	6	67	27	0	184
August ..	-9	-5	0	5	-4	0	14	7	0	16	7	0	13	0	0	6	7	0	5	11	0	3	1	0	3	63	34	0	196
September	5	-5	0	-5	0	0	4	0	0	18	10	0	19	9	0	9	3	0	5	2	0	5	3	0	6	66	28	0	112
October	0	0	0	0	0	0	1	0	0	3	5	0	9	7	0	16	10	0	13	14	0	7	10	0	5	50	45	0	133
November	3	2	0	2	-8	0	4	3	0	8	2	0	2	0	0	8	5	0	11	9	0	11	21	0	9	49	42	0	136
December	13	3	0	5	3	0	1	0	0	0	-9	0	4	7	0	5	3	0	13	6	0	21	6	0	9	63	28	0	155

Authorities.—Bibliography Nos. 2 and 57.

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South Indian Ocean

TABLE II—continued

Number of occasions per 100 on which particular winds may be expected
 I = Beaufort force 1-3. II = force 4-7. III = force 8-12

0°-5° S., 75°-80° E.

Month	N.			NE.			E.			SE.			S.			SW.			W.			NW.			Calm	Totals of			No. of obs.
	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III		I	II	III	
January	13	12	0	12	5	0	4	.8	0	3	0	0	2	0	0	10	0	0	9	4	0	10	11	0	6	62	32	0	124
February	18	10	0	7	0	0	8	2	0	5	4	0	3	0	0	4	3	0	6	7	0	12	6	0	5	63	32	0	145
March	5	1	0	3	0	0	9	.4	0	7	.5	0	9	2	0	15	7	0	14	5	0	10	9	0	4	71	25	0	116
April	4	2	0	3	0	0	3	0	0	4	2	0	9	1	0	16	6	0	12	7	0	21	3	0	6	73	21	0	116
May	3	0	0	3	.5	0	10	3	0	18	9	0	20	4	0	4	3	0	5	11	0	.5	3	0	3	63	34	0	107
June	2	.5	0	3	.6	0	2	3	0	11	11	0	21	7	0	19	3	0	7	4	.1	2	2	.1	3	67	30	.2	373
July	.4	.2	0	1	.5	0	3	.2	0	18	7	0	26	6	0	15	4	0	6	7	0	0	1	0	2	71	27	0	230
August	1	0	0	3	0	0	9	4	0	14	15	0	15	5	0	9	5	0	3	6	0	2	6	0	2	57	41	0	284
September	7	.7	0	3	0	0	6	5	0	11	12	0	10	8	0	13	7	0	3	5	0	4	.8	0	7	56	37	0	136
October	0	0	0	1	0	0	9	3	0	5	9	0	1	2	0	9	16	0	18	17	0	1	4	0	3	45	52	0	97
November	3	0	0	6	0	0	4	8	0	9	14	0	8	.6	0	4	2	0	15	9	0	4	4	0	10	53	37	0	90
December	10	3	0	5	1	0	2	.3	0	.8	0	0	.5	0	0	5	2	0	19	20	0	18	11	0	3	59	38	0	188

0°-5° S., 80°-85° E.

January	10	2	0	8	2	0	5	.2	0	5	1	0	6	2	0	7	5	.1	8	11	.5	9	8	0	9	58	32	.6	513
February	15	5	0	13	1	0	8	.8	0	3	2	0	5	.9	0	3	1	0	7	6	0	10	13	0	6	64	30	0	236
March	7	1	0	4	.1	0	8	.4	0	4	.5	0	8	2	0	12	3	0	16	7	0	17	4	0	6	76	18	0	390
April	5	.5	0	4	.7	0	6	3	0	8	2	0	12	2	0	12	8	0	10	10	0	8	4	0	6	65	29	0	603
May	3	.8	0	6	0	0	11	3	0	10	3	0	22	3	0	11	6	0	7	6	0	3	1	0	3	74	23	0	445
June	.7	0	0	2	.1	0	9	3	0	13	7	0	21	7	0	12	7	0	5	5	0	2	2	0	5	65	30	0	662
July	1	.2	0	2	.4	0	4	4	0	11	10	0	21	6	0	11	7	0	6	8	.2	3	1	0	4	59	37	.2	542
August	1	.4	0	1	1	0	4	5	0	9	11	0	18	12	0	10	9	0	5	7	0	2	3	0	3	50	47	0	512
September	2	.1	0	3	.5	0	4	5	0	9	12	0	16	6	0	10	8	0	5	7	0	3	3	0	6	53	41	0	377
October	1	0	0	2	1	0	9	4	0	13	12	0	8	2	0	7	12	0	7	9	0	3	4	0	5	51	44	0	304
November	1	.5	0	.8	0	0	4	.9	0	8	4	0	7	3	0	10	9	0	14	15	0	7	7	0	7	52	41	0	335
December	9	2	0	4	.3	0	.9	.8	0	3	4	0	4	3	0	9	7	0	14	15	0	8	9	0	5	53	42	0	625

Authorities.—Bibliography Nos. 2 and 57.

Table I—Wind direction and force at sea

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TABLE II—continued

Number of occasions per 100 on which particular winds may be expected
 I = Beaufort force 1-3. II = force 4-7. III = force 8-12

0°-5° S., 85°-90° E.

Month	N.			NE.			E.			SE.			S.			SW.			W.			NW.			Calm	Totals of			No. of obs.
	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III		I	II	III	
January	8	2	0	7	.5	0	4	.8	0	3	.6	0	5	.3	0	8	5	.1	13	15	.2	12	11	0	5	60	35	.3	1260
February	8	3	0	3	.3	0	4	.4	0	4	.8	0	5	.5	0	7	3	.1	15	9	.4	15	12	.1	8	61	30	.6	1023
March ..	6	2	0	3	.1	0	4	.2	0	8	1	.1	7	1	0	11	4	0	15	10	.1	10	9	0	9	64	27	.2	1170
April ..	5	1	0	5	.4	0	6	1	0	10	3	0	11	2	0	13	3	.1	13	4	.1	6	4	0	12	70	18	.2	782
May ..	1	.1	0	6	.4	0	6	2	0	12	10	0	11	7	0	11	6	0	9	6	0	4	2	0	6	60	34	0	661
June ..	2	.7	0	4	1	0	3	3	0	12	8	0	17	7	0	10	7	0	11	7	0	2	2	0	5	60	35	0	672
July ..	.6	.7	0	1	.3	0	3	2	.2	12	11	.3	17	11	0	10	7	0	5	7	0	2	3	0	5	52	42	.5	625
August ..	1	0	0	2	.7	0	4	6	.1	14	15	0	14	9	0	12	5	0	6	6	0	2	1	0	3	55	42	.1	638
September	.7	.1	0	4	.4	0	8	3	0	13	13	0	13	8	0	9	5	0	7	5	0	5	1	0	6	59	35	0	760
October	3	.8	0	3	.4	0	6	5	0	11	10	0	10	5	0	8	8	0	8	9	.2	5	5	.2	4	54	42	.4	941
November	2	.6	0	3	.6	0	5	2	0	9	5	0	9	4	0	11	9	0	11	11	0	7	5	0	6	57	37	0	1081
December	4	1	0	3	.7	0	3	.4	0	4	1	0	7	1	0	11	9	0	14	14	0	11	8	.3	7	57	36	.3	1234

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South Indian Ocean

0°-5° S., 90°-95° E.

January	7	2	0	2	0	0	2	.4	0	5	.6	0	7	1	0	5	2	0	11	16	.3	13	17	.2	8	53	39	.5	458
February	11	1	0	5	0	0	4	0	0	6	3	0	3	1	0	4	2	.2	17	12	.5	18	6	.7	6	68	25	1	214
March ..	5	2	0	2	.4	0	4	.1	0	4	.2	0	7	1	0	10	7	0	16	18	0	11	10	0	2	59	39	0	311
April ..	4	.6	0	2	.1	0	3	0	0	7	.3	0	6	1	0	11	6	.3	19	18	.4	8	5	.2	7	60	32	.9	553
May ..	3	.4	0	4	.7	0	6	.6	0	15	4	0	12	4	0	13	5	.2	13	5	.1	5	2	.2	8	71	21	.5	867
June ..	5	.8	0	6	.3	0	5	2	0	12	4	.2	8	4	0	9	5	.7	12	10	.5	7	5	.1	5	63	31	1	654
July ..	4	1	.1	4	.7	0	3	1	0	13	8	.1	12	4	0	16	4	0	12	3	.5	5	3	.7	5	69	25	1	728
August ..	7	2	0	9	1	0	6	3	0	9	6	0	8	3	0	9	5	0	9	8	0	4	4	0	7	61	32	0	703
September	4	.8	0	5	.4	0	5	2	0	7	8	0	9	4	0	11	9	0	10	12	.1	3	3	0	7	54	39	.1	615
October	3	2	0	2	.3	0	4	3	0	7	3	0	11	4	0	10	7	0	10	15	.2	5	7	.2	7	52	41	.4	501
November	2	.8	0	3	.6	0	5	2	0	7	1	0	14	3	0	14	4	.1	11	14	.1	6	7	0	7	60	33	.2	390
December	4	2	0	6	.4	0	6	5	0	5	2	0	7	1	0	6	3	0	11	14	0	9	14	.2	5	55	40	.2	532

Authorities.—Bibliography Nos. 2 and 57.

TABLE II—continued

Number of occasions per 100 on which particular winds may be expected

I = Beaufort force 1-3. II = force 4-7. III = force 8-12

5°-10° S., 45°-50° E.

Month	N.			NE.			E.			SE.			S.			SW.			W.			NW.			Calm	Totals of			No. of obs.
	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III		I	II	III	
January	15	9	0	23	7	0	-9	0	0	-4	2	0	1	2	0	2	-4	0	6	3	0	18	4	0	5	68	27	0	117
February	10	8	0	17	1	0	13	-6	0	3	1	0	-6	0	0	3	0	0	9	2	0	5	14	0	12	61	27	0	82
March ..	12	-7	0	14	1	0	24	-7	0	13	3	0	2	0	0	3	0	0	6	0	0	9	-7	0	11	83	6	0	141
April ..	0	0	0	2	0	0	17	0	0	35	0	0	21	1	0	4	-7	0	12	2	0	1	0	0	3	93	4	0	68
May ..	0	0	0	0	0	0	4	8	0	17	45	0	8	13	0	3	1	0	2	0	0	0	0	0	0	33	67	0	159
June ..	0	0	0	0	-3	0	3	6	0	8	36	0	10	35	0	-6	-6	0	0	0	0	0	0	0	0	22	78	0	162
July ..	0	0	0	0	-4	0	-8	8	0	5	45	0	7	28	0	3	2	0	0	0	0	0	0	0	0	17	83	0	115
August ..	0	0	0	1	0	0	4	5	0	17	36	0	-9	28	0	0	0	0	0	0	0	0	0	0	0	31	69	0	151
September	0	0	0	0	0	0	4	4	0	21	41	0	12	19	0	-4	0	0	0	0	0	0	0	0	0	37	63	0	133
October	0	0	0	1	0	0	15	8	0	22	32	0	4	15	0	-7	0	0	-6	0	0	-7	0	0	1	44	55	0	152
November	1	-9	0	4	-9	0	21	10	0	12	22	0	4	0	0	6	0	0	5	-5	0	5	-5	0	6	60	34	0	109
December	19	3	0	29	-6	0	8	0	0	4	1	0	1	0	0	0	0	0	1	2	0	5	5	0	21	67	12	0	87

Table I—Wind direction and force at sea

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5°-10° S., 50°-55° E.

January	31	0	0	63	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	16
February	8	13	0	6	2	0	18	0	0	5	0	0	2	-7	0	18	3	0	13	-8	0	4	0	0	8	73	19	0	64
March ..	7	0	0	8	0	0	11	0	0	10	0	0	6	0	0	5	-7	0	24	2	0	11	0	0	15	82	3	0	66
April ..	0	0	0	0	0	0	6	0	0	13	0	0	42	2	0	15	3	0	15	4	0	0	1	0	0	90	10	0	48
May ..	0	0	0	0	0	0	4	7	0	20	37	0	20	12	0	-6	-6	0	0	0	0	0	0	0	0	44	56	0	81
June ..	0	0	0	0	0	0	2	7	0	15	47	0	7	19	0	2	0	0	-4	0	0	0	0	0	0	27	73	0	131
July ..	0	0	0	0	0	0	-4	2	0	9	46	0	20	22	0	1	0	0	0	0	0	0	0	0	0	30	70	0	109
August ..	0	0	0	0	0	0	8	6	0	33	38	0	8	7	0	0	-6	0	0	0	0	0	0	0	0	49	51	0	170
September	0	0	0	-4	0	0	5	8	0	18	60	0	5	4	0	0	0	0	0	0	0	0	0	0	0	28	72	0	108
October	0	0	0	0	0	0	10	3	0	37	36	0	3	8	0	0	0	0	0	0	0	0	0	0	3	50	47	0	72
November	0	3	0	5	4	0	43	0	0	14	0	0	0	0	0	3	0	0	7	2	0	0	9	0	10	72	18	0	29
December	4	0	0	14	0	0	17	6	0	16	6	0	4	0	0	5	0	0	4	0	0	6	5	0	13	70	17	0	60

Authorities.—Bibliography Nos. 2 and 57.

TABLE II—*continued*

Number of occasions per 100 on which particular winds may be expected

I = Beaufort force 1-3. II = force 4-7. III = force 8-12

5°-10° S., 55°-60° E.

Month	N.			NE.			E.			SE.			S.			SW.			W.			NW.			Calm	Totals of			No of obs.
	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III		I	II	III	
January	5	0	0	0	0	0	0	0	0	14	11	0	9	5	0	18	25	0	0	0	0	0	0	14	45	41	0	22	
February	20	4	0	15	7	0	16	5	0	6	8	0	2	0	0	4	7	0	4	0	0	14	4	0	5	80	15	0	134
March	2	2	0	8	2	0	25	2	0	21	4	0	4	0	0	0	0	0	11	0	0	10	2	0	8	81	11	0	26
April	3	4	0	4	1	0	22	13	0	11	5	0	11	0	0	10	0	0	4	1	0	7	3	0	0	72	28	0	68
May	5	4	0	7	1	0	25	19	0	12	11	0	5	5	0	5	0	0	0	0	0	0	0	5	59	36	0	132	
June	2	0	0	1	0	0	7	6	0	17	20	0	14	12	0	7	1	0	4	0	0	7	9	0	9	59	40	0	106
July	0	0	0	0	0	0	1	5	0	20	41	0	11	21	0	8	3	0	0	0	0	0	0	0	33	67	0	185	
August	2	5	0	2	2	0	6	10	0	31	34	0	6	7	0	1	0	0	0	0	0	0	0	3	46	51	0	199	
September	7	0	0	3	3	0	4	20	0	21	33	0	11	5	0	3	4	0	0	0	0	0	0	1	40	59	0	151	
October	0	0	0	2	0	0	19	17	0	22	28	0	1	4	0	0	0	0	1	0	0	0	0	3	47	50	0	103	
November	8	0	0	12	0	0	27	13	0	16	12	0	5	2	0	2	0	0	0	0	0	4	0	8	66	26	0	64	
December	5	1	0	4	3	0	24	10	0	7	6	0	6	0	0	2	2	0	5	1	0	8	3	12	61	27	0	74	

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South Indian Ocean

5°-10° S., 60°-65° E.

January	22	0	0	12	0	0	18	16	0	4	4	0	6	0	0	4	0	0	2	0	0	4	0	0	8	72	20	0	25
February	17	12	0	15	0	0	5	0	0	2	0	0	6	0	0	1	9	0	7	1	0	11	8	0	15	64	21	0	52
March	7	5	0	3	0	0	11	0	0	5	0	0	6	0	0	16	0	0	7	2	0	10	12	0	16	65	19	0	55
April	6	2	0	6	3	0	13	11	0	9	2	0	12	0	0	10	2	0	4	5	0	4	2	0	8	64	28	0	128
May	2	4	0	9	1	0	8	6	0	21	23	0	14	5	0	4	8	0	3	0	0	2	4	0	4	60	36	0	134
June	3	0	0	4	0	0	10	10	0	24	38	0	3	9	0	2	1	0	4	0	0	0	0	0	2	39	59	0	142
July	0	0	0	9	0	0	4	9	0	21	41	0	5	20	0	0	0	0	0	0	0	0	0	0	0	30	70	0	112
August	0	0	0	1	0	0	7	1	0	29	21	0	17	0	0	11	0	0	7	0	0	0	0	0	6	72	22	0	36
September	0	0	0	0	0	0	1	10	0	5	57	0	1	17	0	1	3	0	1	0	0	0	0	3	11	86	0	36	
October	0	0	0	6	3	0	18	21	0	5	42	0	1	2	0	0	0	0	0	0	0	0	0	2	30	68	0	105	
November	12	0	0	6	0	0	12	14	0	13	7	0	6	0	0	12	0	0	1	0	0	5	0	12	67	21	0	42	
December	2	0	0	5	1	0	9	9	0	10	7	0	5	0	0	17	6	0	6	8	0	4	7	9	58	33	0	81	

Authorities.—Bibliography Nos. 2 and 57.

TABLE II—continued

Number of occasions per 100 on which particular winds may be expected
 I = Beaufort force 1-3. II = force 4-7. III = force 8-12

5°-10° S., 65°-70° E.

Month	N.			NE.			E.			SE.			S.			SW.			W.			NW.			Calm	Totals of			No. of obs.
	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III		I	II	III	
January	3	1	0	3	6	0	13	0	0	6	0	0	4	0	0	5	2	0	12	9	0	19	12	0	3	66	31	0	74
February	10	3	0	12	0	0	15	0	0	4	0	0	13	0	0	4	0	0	8	5	0	14	11	0	3	79	18	0	82
March ..	6	0	0	10	-6	0	18	3	0	5	-6	0	3	0	0	7	4	0	6	3	0	22	8	0	5	75	20	0	88
April ..	4	-7	0	4	1	0	10	6	0	16	9	0	11	-8	0	4	3	1	4	9	-7	4	4	0	8	56	34	2	140
May ..	0	1	0	6	0	0	7	6	0	25	19	0	20	-6	0	8	0	0	-5	0	0	4	0	0	3	70	27	0	95
June ..	-3	-3	0	5	1	0	10	7	0	20	29	0	4	8	0	1	-4	0	3	0	0	5	0	0	7	47	46	0	153
July ..	0	0	0	1	0	0	4	8	0	29	37	0	13	8	0	0	0	0	0	0	0	0	0	0	0	48	52	0	105
August ..	0	0	0	-6	0	0	11	5	0	28	33	0	11	12	0	0	0	0	0	0	0	0	0	0	0	51	49	0	85
September	0	0	0	2	-4	0	9	25	0	9	43	0	4	7	0	-4	0	0	0	0	0	0	0	0	0	24	76	0	133
October	-7	0	0	3	2	0	15	7	0	23	29	0	7	3	0	1	1	0	1	-7	0	2	0	0	4	53	43	0	149
November	7	-8	0	12	3	0	14	28	0	6	8	0	5	1	0	0	1	0	0	1	0	6	1	0	6	49	45	0	132
December	5	2	0	3	3	0	12	16	0	13	6	0	6	0	0	2	0	0	1	6	-5	3	14	-6	6	46	47	1	94

5°-10° S., 70°-75° E.

January	8	8	0	2	19	0	4	10	0	13	0	0	4	0	0	0	0	0	4	0	0	15	0	0	13	50	37	0	24
February	8	2	0	9	0	0	14	0	0	7	0	0	0	0	0	8	0	0	10	0	0	12	6	0	24	69	7	0	54
March ..	0	0	0	28	0	0	9	0	0	19	0	0	4	4	0	0	4	0	2	2	0	28	2	0	0	89	11	0	27
April ..	12	0	0	4	1	0	12	10	0	19	11	0	5	0	0	4	-6	0	1	1	0	5	5	0	9	62	29	0	77
May ..	2	0	0	3	0	0	8	3	0	27	24	0	8	2	0	2	0	0	1	0	0	3	0	0	17	53	30	0	71
June ..	-4	0	0	3	-4	0	6	7	0	23	36	0	9	8	0	-9	-5	0	0	0	0	-2	0	0	5	43	52	0	223
July ..	0	0	0	0	0	0	4	7	0	21	38	-3	11	16	-3	1	0	0	0	0	0	0	0	0	1	37	61	-6	166
August ..	0	0	0	3	0	0	5	29	0	9	46	0	2	7	0	0	0	0	0	0	0	0	0	0	0	18	82	0	116
September	0	0	0	0	0	0	8	2	0	19	45	0	12	14	0	0	0	0	0	0	0	0	0	0	0	40	60	0	81
October	-8	-9	0	6	3	0	10	6	0	20	16	0	9	8	0	-9	-8	0	3	3	0	4	6	0	3	54	43	0	59
November	2	2	0	7	5	0	9	13	0	16	17	0	3	3	0	1	1	0	0	1	0	5	5	0	9	43	48	0	86
December	6	6	0	3	3	0	16	2	0	16	0	0	8	0	0	5	5	0	0	15	0	2	13	0	2	56	42	0	52

Authorities.—Bibliography Nos. 2 and 57.

Table I—Wind direction and force at sea

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TABLE II—continued

Number of occasions per 100 on which particular winds may be expected

I = Beaufort force 1-3. II = force 4-7. III = force 8-12

5°-10° S., 75°-80° E.

Month	N.			NE.			E.			SE.			S.			SW.			W.			NW.			Calm	Totals of			No. of obs.
	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III		I	II	III	
January	4	2	0	4	2	0	4	3	0	5	4	0	4	0	0	5	5	0	11	7	0	15	18	0	7	52	41	0	120
February	1	7	0	3	1	0	6	6	0	5	8	0	7	2	0	5	1	0	9	9	0	11	16	0	3	47	50	0	141
March ..	5	1	0	10	1	0	21	8	0	14	10	·5	9	·8	0	3	·5	0	5	·2	0	5	2	0	4	71	24	·5	188
April ..	4	1	0	5	1	0	14	6	0	17	12	0	13	2	0	6	2	0	5	·2	0	5	2	0	6	68	26	0	188
May ..	1	0	0	6	·3	0	12	7	0	19	19	0	7	7	0	5	·8	0	5	3	0	5	·8	0	3	59	38	0	133
June ..	·1	·3	0	2	·2	0	4	11	0	22	35	0	13	5	0	2	·3	0	·2	·2	0	1	·1	0	3	45	52	0	316
July ..	0	0	0	2	0	0	3	16	0	17	43	0	7	10	0	·3	·3	0	0	0	0	0	0	0	·6	30	69	0	157
August	2	0	0	1	3	0	4	15	0	7	47	0	3	13	0	·9	·2	0	·4	0	0	·8	0	0	2	20	78	0	330
September	0	·9	0	3	1	0	9	11	·4	7	53	·4	3	5	0	·5	·4	0	·4	0	0	·4	·4	0	4	23	72	·8	119
October	0	0	0	2	2	0	3	19	0	12	32	0	4	16	0	2	1	0	·3	2	0	·7	1	0	3	24	73	0	157
November	0	0	0	0	·5	0	4	16	0	10	43	0	6	12	0	·5	0	0	·5	·5	0	2	5	0	2	22	76	0	99
December	1	·9	0	5	2	0	16	5	0	8	19	0	4	2	0	5	3	0	6	5	·5	5	6	0	6	51	43	·5	214

5°-10° S., 80°-85° E.

January	2	1	0	3	1	0	6	4	0	13	8	0	7	3	0	10	3	0	9	14	0	4	7	0	5	54	41	0	535
February	5	3	0	4	·8	0	6	4	0	10	7	0	7	4	·4	9	4	0	5	11	0	7	13	0	2	51	46	·4	254
March ..	3	1	0	5	·3	0	11	6	0	9	5	0	10	3	0	10	3	0	11	5	0	8	4	0	5	67	28	0	428
April ..	2	·5	0	4	2	0	11	12	0	16	14	0	11	4	·2	4	1	0	4	3	0	3	2	0	5	55	40	·2	543
May ..	1	·4	·3	2	2	0	9	14	0	13	27	0	9	8	0	2	2	·1	2	2	·5	1	1	·6	3	39	57	1	536
June ..	1	·4	0	2	1	0	9	16	·1	15	35	·3	7	6	0	·9	0	0	·7	·4	0	2	·2	0	1	39	60	·4	534
July ..	·9	1	0	2	1	0	4	13	0	12	36	·2	9	11	0	2	·3	0	2	0	0	2	1	0	4	33	63	·2	487
August ..	·4	·3	0	2	2	0	5	18	0	10	37	·9	5	14	·4	2	·7	0	·5	·4	0	·5	0	0	0	26	73	1	386
September	·7	0	0	2	·8	0	6	27	0	7	37	0	6	8	0	2	·6	0	·8	·3	0	1	·2	0	1	25	74	0	345
October..	1	·9	0	3	3	0	5	17	0	12	41	0	2	7	0	3	·2	0	2	·3	0	·7	·2	0	·9	29	70	0	215
November	·8	·6	0	5	2	0	7	7	0	8	35	0	7	12	·3	5	1	0	3	2	0	·9	·6	0	3	37	60	·3	388
December	4	·6	0	5	·9	0	7	6	0	14	16	0	8	6	0	8	1	0	8	4	0	4	1	0	7	58	35	0	649

Authorities.—Bibliography Nos. 2 and 57.

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South Indian Ocean

TABLE II—continued

Number of occasions per 100 on which particular winds may be expected

I = Beaufort force 1-3. II = force 4-7. III = force 8-12

5°-10° S., 85°-90° E.

Month	N.			NE.			E.			SE.			S.			SW.			W.			NW.			Calm	Totals of			No. of obs.
	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III		I	II	III	
January	5	.7	0	5	.7	0	8	3	0	13	5	0	7	3	0	9	5	.2	9	9	.1	7	4	.1	5	62	32	-.4	1167
February	3	1	0	3	.2	0	10	1	0	9	3	0	8	2	0	9	4	0	14	9	.5	7	10	.7	4	64	31	1	761
March ..	3	1	0	3	1	0	5	2	0	12	6	0	9	3	0	9	3	0	10	8	.1	8	9	.5	8	59	33	-.6	704
April ..	5	2	0	3	1	0	11	9	.2	15	18	.1	8	4	0	5	.9	0	5	1	0	4	1	.1	5	56	38	-.4	686
May ..	2	2	0	6	2	.2	7	9	0	12	33	.2	6	11	.1	1	.9	.2	1	.8	.1	1	.9	0	2	37	60	-.8	514
June ..	3	.5	0	3	2	0	5	7	.2	12	40	.6	8	11	0	2	.9	0	.6	.2	0	1	1	0	3	34	62	-.8	490
July ..	0	.5	0	1	.3	0	4	7	0	16	39	2	9	12	.3	2	.6	0	.3	.3	0	.7	.3	0	4	33	61	2	362
August ..	3	.7	0	5	5	0	4	17	0	8	36	.3	4	9	0	3	.3	0	1	.2	0	2	.3	0	2	30	68	-.3	585
September	1	.2	0	6	2	0	12	15	0	10	32	.5	4	7	.2	.8	3	0	.4	1	0	.9	.5	0	2	36	61	-.7	472
October	3	.8	0	7	5	0	8	21	.3	11	20	.1	4	2	0	1	2	0	4	2	0	4	3	0	1	42	56	-.4	536
November	7	3	0	7	3	0	10	11	0	10	14	0	6	4	0	4	2	0	5	3	0	6	2	0	4	54	42	0	683
December	2	.7	0	4	2	0	9	7	0	12	11	0	11	6	0	8	4	.1	7	5	.1	5	3	0	5	57	38	-.2	1081

5°-10° S., 90°-95° E.

January	2	1	0	3	.2	0	9	3	0	18	7	0	7	3	.3	3	4	0	7	10	0	6	10	0	6	55	39	-.3	423
February	4	.6	0	3	0	0	5	.5	0	9	2	0	4	.8	0	7	3	.1	14	14	1	8	12	.4	11	54	33	2	278
March ..	5	4	.2	5	1	0	5	2	0	12	3	0	5	.8	0	9	3	.1	10	8	.5	9	9	.5	8	60	31	1	555
April ..	4	1	0	5	2	0	8	4	0	14	9	.2	9	3	.1	7	3	0	8	6	0	4	4	.4	8	59	32	-.7	697
May ..	3	.2	0	8	1	0	11	8	0	16	29	0	5	7	0	2	1	0	2	.5	0	2	.3	0	4	50	46	0	536
June ..	5	3	0	4	3	0	11	9	.1	17	27	.4	3	4	0	2	.4	0	2	2	0	3	2	0	2	48	49	.5	579
July ..	4	3	0	6	2	0	7	9	0	14	23	.3	3	4	.1	3	1	0	4	3	.1	5	4	.1	3	47	49	-.6	564
August ..	3	3	0	5	8	0	5	15	0	10	37	.2	2	3	0	.8	0	0	.4	.8	0	.7	3	0	2	27	71	-.2	579
September	3	2	0	5	2	0	8	15	0	9	27	.5	3	3	0	2	1	.4	5	4	.5	3	3	.5	3	37	58	2	566
October	3	3	0	5	4	0	8	19	0	11	28	0	3	2	0	3	2	0	3	3	0	1	2	0	2	35	63	0	556
November	5	1	0	4	1	0	6	13	0	7	22	0	5	2	0	3	.9	0	7	5	0	5	4	0	8	43	49	0	489
December	2	.9	0	3	2	0	6	13	0	16	13	0	8	2	0	6	3	0	6	4	0	5	3	0	5	53	42	0	547

Authorities.—Bibliography Nos. 2 and 57.

Table II—Wind direction and force at sea 8 77

TABLE II—continued

Number of occasions per 100 on which particular winds may be expected

I = Beaufort force 1-3. II = force 4-7. III = force 8-12

10°-15° S., 55°-60° E.

Month	N.			NE.			E.			SE.			S.			SW.			W.			NW.			Calm	Totals of			No. of obs.
	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III		I	II	III	
January	2	9	0	2	19	0	0	2	0	0	7	0	0	0	0	0	0	0	0	33	0	5	19	0	0	10	90	0	21
February	3	3	0	14	5	0	19	14	0	11	2	0	4	6	0	2	0	0	6	0	0	3	0	0	14	62	24	0	92
March ..	5	4	0	9	1	0	8	0	0	7	24	0	2	6	0	5	4	0	0	8	3	2	4	3	2	40	52	6	48
April ..	0	0	0	5	6	0	13	40	0	3	12	0	5	0	0	7	0	0	5	1	0	2	3	0	5	33	62	0	64
May ..	1	0	0	5	6	0	14	60	0	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	5	25	70	0	67
June ..	0	0	0	0	1	0	3	40	7	6	37	8	0	11	0	0	0	0	0	0	0	0	0	0	0	9	90	1	67
July ..	0	0	0	2	3	0	9	14	0	8	48	0	3	13	0	0	0	0	0	0	0	0	0	0	0	21	79	0	118
August ..	6	0	0	9	0	0	7	24	0	17	46	0	3	3	0	0	0	0	0	0	0	0	0	0	0	26	74	0	172
September	0	0	0	5	6	0	5	46	0	5	34	0	3	0	0	0	0	0	0	0	0	0	0	0	0	14	86	0	100
October	0	0	0	2	4	0	19	41	0	12	22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	33	67	0	109
November	1	0	0	5	9	0	20	31	0	12	25	0	1	0	0	5	0	0	4	0	0	5	0	0	2	41	57	0	106
December	2	0	0	8	9	0	32	26	0	13	17	0	9	9	0	0	0	0	0	0	0	0	0	0	0	55	45	0	56

10°-15° S., 60°-65° E.

January	15	0	0	14	0	0	21	12	0	5	13	0	0	8	0	0	0	0	0	0	9	0	0	3	64	33	0	33	
February	12	7	0	21	9	0	15	1	0	8	0	0	12	0	0	1	0	0	3	0	0	3	1	0	6	76	18	0	33
March ..	12	20	0	12	6	0	8	4	0	0	0	0	0	0	0	2	0	0	2	4	0	6	23	0	1	42	57	0	65
April ..	2	7	0	10	6	0	19	14	0	12	19	0	5	3	0	7	1	0	1	0	0	1	0	0	5	51	44	0	146
May ..	0	0	0	3	2	0	21	27	8	27	17	9	0	0	0	0	0	0	0	0	0	0	0	0	2	50	46	2	60
June ..	0	0	0	3	0	0	16	13	0	3	63	0	1	2	0	0	0	0	0	0	0	0	0	0	0	23	77	0	48
July ..	0	0	0	0	0	0	20	6	0	31	34	0	2	7	0	0	0	0	0	0	0	0	0	0	0	53	47	0	76
August ..	0	0	0	0	2	0	7	16	0	8	61	0	2	5	0	0	0	0	0	0	0	0	0	0	0	16	84	0	31
September	0	0	0	0	0	0	0	27	0	2	67	0	0	3	0	0	0	0	0	0	0	0	0	0	2	2	96	0	56
October	0	0	0	0	0	0	3	40	0	0	57	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	97	0	68
November	2	0	0	5	7	0	24	36	0	12	10	0	0	0	0	0	0	0	0	0	0	0	0	0	4	44	52	0	46
December	0	0	0	0	0	0	3	71	0	0	26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	97	0	29

Authorities.—Bibliography Nos. 2 and 57.

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South Indian Ocean

TABLE II—continued

Number of occasions per 100 on which particular winds may be expected

I = Beaufort force 1-3. II = force 4-7. III = force 8-12

10°-15° S., 65°-70° E.

Month	N.			NE.			E.			SE.			S.			SW.			W.			NW.			Calm	Totals of			No. of obs.
	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III					
January	0	.9	0	6	4	0	18	11	0	10	14	0	5	5	0	0	4	0	.9	7	0	4	9	0	0	45	55	0	58
February	0	0	0	0	5	0	7	13	0	3	7	0	0	10	0	0	17	0	5	13	0	5	15	0	0	20	80	0	20
March ..	2	0	0	4	2	0	31	11	0	24	6	0	5	0	0	7	0	0	2	0	0	.9	0	0	5	76	19	0	58
April ..	4	0	0	4	2	0	13	23	0	4	35	0	4	2	0	0	0	0	0	0	0	0	0	0	8	29	63	0	24
May ..	0	0	0	0	0	0	12	33	0	8	35	0	0	11	0	0	0	0	0	0	0	0	0	0	0	20	80	0	54
June ..	0	0	0	0	.5	0	.5	9	0	7	69	3	1	10	.5	0	0	0	0	0	0	0	0	0	0	9	88	3	93
July ..	0	0	0	0	0	0	5	13	0	12	57	2	3	8	1	0	0	0	0	0	0	0	0	0	0	20	77	3	160
August ..	0	0	0	0	0	0	.6	26	0	12	47	0	.7	14	0	0	0	0	0	0	0	0	0	0	0	13	87	0	77
September	0	0	0	0	0	0	11	37	0	4	45	0	0	3	0	0	0	0	0	0	0	0	0	0	0	16	84	0	57
October	0	0	0	2	5	0	15	44	0	5	28	0	0	0	0	0	0	0	0	0	0	0	0	0	2	21	77	0	62
November	3	.4	0	1	4	0	17	36	0	9	28	0	.3	.4	0	.4	0	0	0	0	0	.3	.3	0	0	31	69	0	141
December	0	0	0	2	4	0	5	52	0	2	23	0	5	0	0	0	0	0	2	0	0	0	0	0	5	16	79	0	55

10°-15° S., 70°-75° E.

January	13	25	0	16	16	0	28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	56	44	0	16
February	13	0	0	10	7	0	27	0	0	18	0	0	3	0	0	0	0	0	10	0	0	7	0	0	7	86	7	0	15
March ..	3	0	0	12	0	0	13	22	0	17	18	0	1	0	0	2	0	0	3	0	0	5	0	0	3	57	40	0	67
April ..	0	3	0	2	1	0	6	29	0	3	43	0	3	9	0	0	0	0	0	0	0	0	2	0	0	14	86	0	74
May ..	.3	0	0	.3	2	0	7	14	.3	9	51	2	1	10	0	.6	0	0	0	0	0	0	0	0	2	19	77	2	154
June ..	0	0	0	.8	1	0	10	20	0	11	49	.2	2	5	.2	.4	0	0	0	0	0	0	0	0	1	24	75	0	286
July ..	0	0	0	0	0	0	7	11	0	9	54	0	2	17	0	0	0	0	0	0	0	0	0	0	0	18	82	0	136
August ..	0	0	0	0	.3	0	2	24	0	3	55	3	2	10	.9	0	0	0	0	0	0	0	0	0	0	7	89	4	163
September	0	0	0	0	.7	0	.7	12	0	2	77	0	0	7	0	0	0	0	0	0	0	0	0	0	0	3	97	0	74
October	0	0	0	0	0	0	7	13	0	11	61	0	2	7	0	0	0	0	0	0	0	0	0	0	0	20	80	0	81
November	0	1	0	5	3	0	8	18	0	9	47	0	.7	5	0	.7	0	0	0	0	0	0	.3	0	2	23	75	0	138
December	.5	0	0	4	1	0	3	19	0	3	54	0	3	10	0	.5	2	0	0	1	0	0	0	0	0	13	87	0	98

Authorities.—Bibliography Nos. 2 and 57.

Table II—Wind direction and force at sea 8 79

TABLE II—continued

Number of occasions per 100 on which particular winds may be expected

I = Beaufort force 1-3. II = force 4-7. III = force 8-12

10°-15° S., 75°-80° E.

Month	N.			NE.			E.			SE.			S.			SW.			W.			NW.			Calm	Totals of			No. of obs.
	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III		I	II	III	
January	1	2	0	3	8	0	8	18	0	3	48	0	2	3	0	0	.8	0	.2	.9	0	.9	.8	0	0	18	82	0	175
February	3	.5	0	8	5	0	8	23	2	7	29	0	0	1	0	2	0	0	4	0	0	3	0	0	5	35	58	2	175
March ..	1	.1	0	6	6	0	11	18	0	16	18	0	7	2	0	2	.6	0	5	.9	0	4	.5	0	3	51	46	0	317
April ..	0	0	0	3	2	0	11	38	0	12	27	0	3	3	0	.3	0	0	0	0	0	0	0	0	.7	29	70	0	320
May ..	.2	.5	.1	1	1	0	7	21	.2	7	51	.1	1	10	.1	.2	.2	0	0	0	0	.3	.7	.1	0	16	83	.6	481
June ..	0	0	0	.6	1	0	3	26	0	6	55	.2	2	6	0	0	.3	0	0	0	0	0	0	0	0	12	88	.2	432
July ..	0	0	0	0	0	0	2	22	0	4	55	2	2	11	.5	.3	.2	0	0	0	0	0	0	0	0	8	89	3	321
August ..	0	0	0	0	.2	0	.1	18	.4	1	70	3	0	7	1	0	0	0	0	0	0	0	0	0	0	1	94	5	386
September	0	0	0	.3	0	0	2	12	.3	3	61	2	.3	18	0	0	.8	0	0	0	0	0	0	0	.5	5	92	2	183
October	.2	.2	0	2	1	0	2	23	0	3	59	2	0	8	.3	0	0	0	0	0	0	0	0	0	0	7	91	2	209
November	.7	.2	0	.2	1	0	2	13	0	7	62	0	3	9	0	0	0	0	0	0	0	.5	0	0	2	13	85	0	288
December	.1	.3	.3	2	3	.6	4	19	0	5	46	.1	1	10	.2	.8	.4	.1	1	.6	1	1	2	.6	.5	15	81	3	393

10°-15° S., 80°-85° E.

January	2	2	.7	5	4	0	7	12	.3	11	29	0	4	4	0	2	2	.2	2	5	.4	1	3	.9	3	34	60	3	668
February	2	1	0	6	3	0	12	15	0	14	25	0	5	3	0	2	.3	0	2	2	0	2	1	0	4	45	51	0	441
March ..	2	4	.1	8	6	.3	9	19	.2	11	21	0	6	4	0	2	.5	0	.8	.7	.1	.5	2	.7	1	39	59	1	541
April ..	.3	.2	0	3	5	0	5	32	.4	9	36	.5	2	4	0	0	0	0	.1	0	0	.3	0	0	.3	21	78	.8	635
May ..	.3	.4	0	.3	2	.1	6	26	.1	7	42	0	3	8	0	2	.4	0	.3	.5	0	.9	.8	0	0	20	80	.2	517
June ..	1	.4	0	3	1	0	4	21	0	4	54	.4	2	7	0	.2	.4	0	.1	.2	0	.9	.2	0	0	15	85	.4	542
July ..	.2	0	0	.9	.4	0	5	18	.1	5	58	2	2	7	.3	0	0	0	0	0	0	.3	0	0	.2	14	83	3	391
August ..	0	0	0	1	2	0	3	21	.4	3	51	4	3	10	2	.1	.3	0	0	0	0	0	0	0	0	9	84	7	512
September	0	0	0	0	.2	0	2	25	.6	2	58	.6	1	10	0	0	.1	0	0	0	0	0	0	0	0	5	94	1	415
October	0	0	0	.4	1	0	2	28	.4	8	50	2	2	5	.2	.4	0	0	0	0	0	0	0	0	.4	13	84	2	243
November	.4	1	0	3	3	0	7	23	.1	1	55	.1	.6	4	0	.5	0	0	0	0	0	0	0	0	.3	12	87	.2	352
December	.5	.4	0	3	1	0	9	15	0	13	39	0	3	6	0	.8	0	0	2	1	0	1	.4	0	4	33	63	0	508

Authorities.—Bibliography Nos. 2 and 57.

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South Indian Ocean

TABLE II—continued

Number of occasions per 100 on which particular winds may be expected

I = Beaufort force 1-3. II = force 4-7. III = force 8-12

10°-15° S., 85°-90° E.

Month	N.			NE.			E.			SE.			S.			SW.			W.			NW.			Calm	Totals of			No. of obs.
	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III		I	II	III	
January	2	3	.7	6	4	.7	11	21	.2	7	21	0	6	3	0	2	1	.2	2	1	.3	1	3	.9	3	36	58	3	582
February	3	.8	.9	3	3	.3	10	17	1	14	12	.1	9	3	.2	3	2	.1	3	2	.9	3	5	1	3	48	44	5	444
March ..	3	5	.2	5	4	0	5	7	0	12	27	0	6	4	0	3	2	0	2	5	.2	3	6	.6	1	39	59	1	400
April ..	2	1	0	3	2	0	4	20	.1	11	44	.9	3	5	0	.5	0	0	.3	.7	0	1	.8	0	.7	25	73	1	435
May ..	0	1	0	.4	3	.2	4	21	.4	4	52	.3	.9	10	0	.3	0	0	0	.5	0	0	2	0	0	10	89	.9	212
June ..	1	2	0	.8	4	0	4	15	.6	6	48	3	.5	8	0	1	.4	0	1	0	0	2	.9	0	1	17	79	3	258
July ..	.8	.4	0	4	1	0	3	15	.2	1	54	1	.6	12	0	.4	0	0	1	.6	0	2	2	0	0	13	85	2	249
August ..	.3	.3	0	5	8	0	10	20	.5	6	33	4	2	9	1	.6	.2	0	0	0	0	0	0	0	0	24	71	5	313
September	0	.3	0	1	2	0	2	28	.3	3	53	2	1	6	0	0	0	0	.3	0	0	0	0	0	.3	8	90	2	304
October	0	.4	0	3	2	0	4	37	.5	4	44	.2	1	.7	0	.3	0	0	.2	.3	0	.3	2	0	.9	13	86	.7	320
November	.1	.8	0	.7	3	0	2	33	.8	4	43	.4	2	6	.4	.8	.2	0	.1	.5	0	.6	.4	0	2	10	86	2	366
December	1	.2	0	5	4	0	6	27	.2	8	29	.2	4	6	.3	1	1	.1	2	.5	0	1	.7	0	2	29	68	.8	509

10°-15° S., 90°-95° E.

January	1	.5	0	4	3	0	8	13	0	14	34	0	5	5	0	.7	1	0	1	.8	0	1	1	0	5	36	59	0	318
February	3	.8	0	5	2	0	8	5	0	17	12	.6	5	2	.3	2	4	.2	3	8	1	6	6	.4	7	50	40	3	242
March ..	3	.3	.9	7	.4	0	11	11	0	16	24	0	4	2	0	4	.5	0	3	3	0	5	2	.3	4	51	44	1	326
April ..	1	.9	0	5	2	0	12	15	0	10	33	0	5	8	0	3	.2	0	3	.2	0	.6	.3	0	3	38	59	0	224
May ..	0	0	0	2	1	0	11	20	0	13	45	0	1	5	0	.6	0	0	0	0	0	0	0	0	1	28	71	0	165
June ..	.8	1	0	.9	2	0	7	11	0	13	38	0	9	8	0	4	1	0	2	.2	0	1	.2	0	1	38	61	0	265
July ..	2	2	0	4	.3	0	5	13	0	7	44	.5	1	11	0	1	2	0	4	.7	0	1	.3	0	1	26	73	.5	194
August ..	3	.2	0	3	1	0	5	27	0	6	47	.9	1	3	.2	.9	0	0	.2	.3	0	.4	0	0	.3	20	79	1	279
September	0	0	0	.6	2	0	2	21	0	4	55	.2	3	5	.2	3	0	0	1	0	0	.5	0	0	.9	14	85	.4	228
October	0	.1	0	.6	3	0	2	34	.5	5	49	.2	.6	2	0	.7	1	0	.6	.3	0	.3	0	0	0	10	89	.7	319
November	0	1	.2	0	2	.3	5	30	2	10	35	2	3	4	0	.6	.2	0	.5	0	0	.3	2	.1	1	20	74	5	319
December	.4	.3	0	3	4	0	10	22	0	12	38	0	1	4	0	1	.2	0	.2	0	0	.5	.1	0	2	29	69	0	367

Authorities.—Bibliography Nos. 2 and 57.

Table I—Wind direction and force at sea

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TABLE II—continued

Number of occasions per 100 on which particular winds may be expected

I=Beaufort force 1-3. II=force 4-7. III=force 8-12

15°-20° S., 55°-60° E.

Month	N.			NE.			E.			SE.			S.			SW.			W.			NW.			Calm	Totals of			No. of obs.
	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III		I	II	III	
January..	5	.7	0	20	5	0	5	17	0	3	14	0	3	2	9	.8	1	0	.7	5	0	6	0	0	3	42	46	9	66
February	2	2	0	10	7	0	22	29	0	11	7	0	1	1	0	2	0	0	.3	0	0	3	0	0	3	51	46	0	153
March ..	4	.8	.8	9	4	0	11	17	0	11	21	2	6	2	2	2	.4	.4	1	1	.4	.4	3	0	0	45	49	6	123
April ..	.2	1	.5	4	6	0	11	32	0	11	24	.6	3	3	.7	0	0	.4	0	0	0	.6	0	2	29	67	2	215	
May ..	0	.9	0	2	2	0	10	31	.6	16	22	0	6	5	0	.9	.6	0	.3	0	.3	.3	.8	.3	2	35	62	1	173
June ..	1	0	0	2	1	0	6	34	.2	6	41	.2	2	5	0	0	.3	0	0	0	0	0	.2	0	0	18	82	.4	228
July ..	0	0	0	.7	1	0	13	16	0	17	39	.5	6	8	0	.6	0	0	0	0	0	0	0	0	0	37	63	.5	422
August ..	.3	0	0	2	2	0	11	26	.8	12	35	2	3	3	0	1	.1	0	0	.2	0	.1	0	0	.6	29	67	3	347
September	.4	0	0	5	2	0	14	26	0	13	33	0	3	3	0	1	0	0	0	0	0	0	0	0	0	36	64	0	249
October..	.4	0	0	5	5	0	14	32	0	21	15	0	4	3	0	.2	0	0	.3	0	0	0	0	0	.4	44	55	0	222
November	1	.5	0	9	6	0	21	25	0	12	19	0	1	1	0	.5	.3	0	.5	0	0	.3	0	0	3	45	52	0	196
December	1	0	0	14	7	0	25	29	0	6	8	0	1	3	0	.8	.9	0	2	.6	0	.9	0	0	.5	51	49	0	175

15°-20° S., 60°-65° E.

January..	2	0	0	14	2	0	14	37	0	4	23	0	0	1	0	0	0	0	0	0	0	0	0	2	35	63	0	49	
February	0	0	0	11	5	0	24	26	2	10	18	0	.6	2	0	0	0	0	0	0	0	0	0	0	0	46	52	2	95
March ..	10	1	0	5	5	0	7	24	2	8	23	2	.5	0	0	2	0	0	1	0	0	5	2	0	3	38	55	4	99
April ..	2	1	0	2	4	0	17	29	0	9	29	1	.8	2	0	1	0	0	0	0	0	.5	0	0	1	33	65	1	189
May ..	2	0	0	4	2	0	10	19	.7	11	36	2	4	4	0	1	2	0	0	0	0	.2	0	0	2	32	63	3	193
June ..	.9	.1	0	.6	1	0	1	17	2	8	48	3	4	12	0	.2	0	0	.3	0	0	.4	0	0	1	16	78	5	274
July ..	0	0	0	1	.9	0	5	16	.1	15	44	1	6	9	.3	.4	.2	0	0	0	0	0	0	.3	28	70	2	391	
August ..	0	0	0	.4	1	0	4	20	0	11	47	.3	3	13	0	.4	.8	0	.5	0	0	0	0	.3	19	81	.3	334	
September	.6	0	0	3	2	0	7	25	0	7	38	0	2	10	0	1	2	0	2	0	0	.9	0	0	0	24	76	0	231
October..	0	0	0	.8	3	0	2	28	0	9	44	0	2	8	0	.8	0	0	0	.4	0	0	.4	0	2	14	84	0	123
November	0	0	0	7	5	0	17	39	0	8	21	0	1	2	0	0	0	0	0	0	0	0	0	0	0	33	67	0	193
December	4	0	0	10	7	0	34	15	0	11	8	0	10	0	0	1	0	0	0	0	0	.8	0	0	0	71	29	0	120

Authorities.—Bibliography Nos. 2 and 57.

TABLE II—continued

Number of occasions per 100 on which particular winds may be expected

I=Beaufort force 1-3. II=force 4-7. III=force 8-12

15°-20° S., 65°-70° E.

Month	N.			NE.			E.			SE.			S.			SW.			W.			NW.			Calm	Totals of			No. of obs.	
	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III		I	II	III		
January..	-5	0	0	1	7	0	6	33	-7	6	30	-2	3	8	0	-4	-8	0	-5	2	0	0	-5	0	0	-4	18	81	-9	216
February	1	0	0	2	5	-9	5	36	1	5	36	1	3	42	-5	-5	2	0	0	0	0	0	0	0	0	0	12	85	3	113
March ..	-6	0	0	11	6	0	13	28	-9	3	29	3	-9	3	0	0	0	0	0	0	0	0	0	0	0	0	30	66	4	157
April ..	1	0	0	4	7	0	7	38	0	2	35	0	-4	5	0	0	0	0	0	0	0	0	0	0	0	0	15	85	0	148
May ..	0	0	0	1	3	0	4	27	-2	6	48	3	2	7	-1	0	0	0	0	0	0	0	0	0	0	0	13	84	3	419
June ..	-5	-2	0	2	2	0	4	15	-1	7	49	1	4	13	-1	1	-6	0	-2	0	0	0	0	0	0	-2	19	80	1	459
July ..	-6	0	0	2	-5	0	2	16	0	4	59	2	2	9	-4	-9	-2	0	-1	0	0	-3	0	0	0	0	13	85	2	369
August ..	0	0	0	1	-6	0	3	24	-2	7	45	-8	5	11	-5	-3	-7	0	0	0	0	0	0	0	0	0	17	81	2	412
September	0	0	0	-1	2	0	2	26	0	7	53	-4	1	8	-2	0	0	0	0	0	0	0	0	0	0	0	10	89	-6	346
October..	0	-3	0	-7	4	0	9	32	0	7	30	-7	3	11	-2	-5	0	0	-1	0	0	-2	0	0	1	20	78	-9	333	
November	-3	-3	0	2	4	0	6	26	0	8	47	0	1	4	0	-3	0	0	-3	-1	0	-5	-2	0	-5	18	81	0	382	
December	0	-3	0	3	5	0	12	26	0	4	43	0	2	4	0	0	-2	0	-3	0	0	-3	0	0	-9	22	77	0	331	

15°-20° S., 70°-75° E.

January..	-2	0	0	-7	4	-5	4	31	1	4	45	-6	1	5	0	0	-7	0	0	0	0	0	0	0	-2	0	0	-8	11	86	2	489
February	2	-3	0	3	1	0	10	18	-3	11	42	2	1	4	-5	0	0	-4	-9	-7	-2	-7	-7	0	-6	29	67	3	305			
March ..	3	1	0	9	7	-3	4	26	-6	3	32	2	3	4	-3	-9	0	0	-3	0	0	1	-4	0	2	24	71	3	340			
April ..	-3	1	0	3	4	-2	6	33	-7	3	37	2	1	7	0	-8	0	0	0	-2	0	-6	-2	0	-7	15	82	2	417			
May ..	-6	-5	0	4	3	0	7	25	-4	7	38	-6	4	8	-5	1	0	0	-2	0	0	-6	0	0	-4	24	74	2	672			
June ..	-7	-2	0	1	2	0	5	25	0	4	49	-6	2	9	-3	1	-2	0	-2	0	0	-3	0	0	-6	13	85	-9	523			
July ..	0	0	0	-9	-6	0	5	20	0	3	55	-7	3	11	-4	-8	-2	0	0	0	0	0	0	0	0	0	13	86	1	377		
August ..	0	0	0	-1	1	0	-8	24	-2	2	57	3	1	11	0	-1	0	0	0	0	0	0	0	0	0	0	4	92	4	458		
September	0	0	0	0	-1	0	1	19	-1	5	56	-9	3	13	-3	1	-8	0	0	0	0	0	0	0	1	10	88	1	297			
October..	-7	2	0	3	4	0	7	23	0	4	39	3	-6	11	-5	1	1	0	0	0	0	-1	-3	0	0	16	80	4	301			
November	-3	-2	0	1	2	0	4	22	0	7	55	0	2	7	0	-3	-2	0	0	0	0	-1	0	0	0	15	85	0	418			
December	0	-3	0	2	1	0	6	27	-2	6	48	0	1	5	0	-9	-3	0	-4	-4	0	0	-3	0	-7	16	83	-2	460			

Authorities.—Bibliography Nos. 2 and 57.

Table II—Wind direction and force at sea

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TABLE II—continued

Number of occasions per 100 on which particular winds may be expected

I=Beaufort force 1-3. II=force 4-7. III=force 8-12

15°-20° S., 75°-80° E.

Month	N.			NE.			E.			SE.			S.			SW.			W.			NW.			Calm	Totals of			No. of obs.
	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III		I	II	III	
January..	-3	1	0	1	4	0	3	25	0	7	48	-5	2	4	-5	2	-2	0	-3	0	0	-6	-1	0	0	17	85	1	480
February	-9	2	0	2	10	0	4	38	-6	3	33	1	1	2	-3	-2	0	0	-1	0	0	-8	-7	0	-3	12	85	2	340
March ..	2	-4	0	4	5	0	5	30	-1	5	34	1	4	5	0	1	1	0	-9	-3	0	2	0	0	-9	23	76	-2	468
April ..	1	2	-1	3	8	0	5	38	0	3	33	0	-6	4	0	-5	0	0	-7	0	0	-7	1	-1	0	14	86	-2	584
May ..	2	0	0	5	1	0	8	25	0	10	37	1	3	5	-3	-8	-2	0	0	0	0	0	0	0	-9	28	69	2	343
June ..	0	0	0	-5	2	0	3	27	-1	3	57	1	-7	5	-6	0	0	0	0	0	0	0	0	0	0	7	91	2	363
July ..	0	0	0	-8	-9	0	6	26	1	4	43	3	-9	13	-3	0	1	0	0	-5	0	0	0	0	-3	12	84	4	322
August ..	0	0	0	-3	-7	0	-6	24	2	-6	55	6	-6	10	-4	0	-5	0	0	0	0	0	0	0	0	2	90	8	357
September	0	0	0	-2	0	0	1	16	-2	3	65	1	1	11	0	0	-6	0	0	0	0	0	0	0	0	5	94	1	251
October..	-4	-5	0	-9	2	0	6	29	0	5	44	1	1	6	-2	0	0	0	-2	0	0	1	-4	0	-7	16	82	1	271
November	-5	0	0	2	1	0	6	23	0	8	48	0	3	8	0	-4	-2	0	-2	0	0	-1	0	0	-2	20	80	0	367
December	-6	0	0	3	2	0	10	29	0	9	39	0	3	2	0	0	0	0	-2	-3	0	0	-1	0	1	27	72	0	458

15°-20° S., 80°-85° E.

January..	-9	2	-6	3	7	-2	5	31	2	4	34	1	-5	4	-2	-7	-6	0	-6	-1	-3	-8	0	0	-7	16	79	5	639
February	1	1	-1	3	7	-6	8	27	2	6	29	-8	3	5	-5	-4	-1	-3	-1	-3	-5	-5	-9	0	1	22	72	5	508
March ..	2	3	-6	4	6	-3	8	32	1	3	26	3	1	2	-3	1	-1	0	2	-2	0	-9	-8	0	-7	22	71	6	694
April ..	-6	0	0	3	5	-1	5	42	-7	3	34	-9	-3	4	-2	-2	-3	0	-2	0	0	-2	0	0	-3	12	86	2	617
May ..	-6	-7	0	3	6	-2	8	33	2	7	29	2	2	3	-4	1	0	-3	-8	-2	0	-1	-7	0	-5	23	72	5	395
June ..	1	0	0	-8	2	2	3	28	2	1	41	2	2	11	0	-4	-4	0	-5	-3	0	-7	0	0	-9	11	83	5	346
July ..	-3	-5	0	2	2	0	5	22	-9	3	50	3	1	10	-4	-3	-3	0	0	0	0	-3	0	0	0	12	84	4	358
August ..	-7	0	0	6	3	0	1	36	1	3	41	4	-6	3	-5	0	0	0	0	0	0	0	0	0	0	11	83	6	441
September	0	0	0	-8	1	0	3	31	-9	2	49	2	-7	9	-5	0	0	0	0	0	0	0	0	0	-2	6	90	4	490
October..	0	-1	0	-5	4	0	4	36	-6	5	41	-3	-5	8	-2	0	-2	0	-2	0	0	-3	0	0	0	10	89	1	383
November	-1	0	0	1	2	0	7	36	0	2	45	0	-9	5	0	-3	-2	0	0	0	0	0	0	0	-6	11	88	0	340
December	-2	-5	0	-3	4	0	6	29	-4	5	44	-4	-6	8	0	-2	-4	0	0	-4	0	0	-4	0	0	13	87	-8	475

Authorities.—Bibliography Nos. 2 and 57.

TABLE II—continued

Number of occasions per 100 on which particular winds may be expected

I=Beaufort force 1-3. II=force 4-7. III=force 8-12

15°-20° S., 85°-90° E.

Month	N.			NE.			E.			SE.			S.			SW.			W.			NW.			Calm	Totals of			No. of obs.
	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III		I	II	III	
January	0	·1	0	3	6	·3	10	38	·2	5	31	·6	·7	3	0	·2	0	0	0	0	0	0	0	·7	19	79	1	598	
February	2	·7	0	4	4	·2	6	31	1	8	30	·7	2	4	·2	·4	·4	0	1	1	·3	2	·7	0	·5	25	72	2	413
March ..	1	·4	0	3	2	0	6	27	0	4	46	0	1	5	0	0	·4	0	·2	·3	0	·6	1	0	·3	18	81	0	275
April ..	0	·7	0	1	4	0	2	41	·8	5	40	·8	0	3	0	0	0	0	0	0	0	0	0	1	8	89	2	192	
May ..	0	·6	0	0	3	0	1	17	1	11	42	5	4	13	0	·7	0	0	0	0	0	0	0	0	18	76	6	78	
June ..	0	·5	0	·5	3	0	8	32	2	5	36	0	3	11	0	0	0	0	0	0	0	0	0	0	16	82	2	95	
July ..	3	0	0	1	0	0	5	20	0	·4	60	2	0	7	0	·8	0	0	0	0	2	0	0	0	12	86	2	126	
August ..	0	0	0	3	2	0	1	33	0	3	49	5	1	4	0	0	·4	0	0	0	0	0	0	0	8	87	5	133	
September	0	0	0	1	1	0	4	26	·2	3	49	4	2	5	2	0	0	0	0	0	0	0	0	·8	11	82	6	247	
October..	·5	0	0	·5	1	0	5	37	·3	2	47	1	·7	3	0	·1	·4	0	0	·1	0	0	0	·5	9	89	2	442	
November	·1	0	0	·4	3	0	2	41	2	3	38	4	1	5	·3	·2	0	0	0	0	0	0	0	0	7	87	6	399	
December	·1	·5	0	·6	1	·2	7	40	1	4	35	·5	2	4	0	·2	·4	0	·8	·5	0	·2	·4	0	·4	15	82	2	562

Table II—Wind direction and force at sea

15°-20° S., 90°-95° E.

January..	·1	0	0	2	3	0	5	31	0	5	44	0	2	9	0	0	0	0	0	0	0	0	0	·3	13	87	0	306	
February	0	0	0	2	1	0	6	17	·8	4	50	0	0	16	0	0	1	0	0	·7	0	0	·4	0	1	12	86	·8	132
March ..	0	0	0	·5	3	0	4	29	0	8	45	0	2	7	0	0	·9	0	0	0	0	0	0	0	0	14	86	0	177
April ..	0	0	0	3	0	·4	6	13	3	8	57	1	2	6	0	0	0	0	0	0	0	0	0	0	0	19	76	5	113
May ..	0	0	0	0	0	0	0	12	0	15	64	0	1	5	0	0	0	0	0	0	0	0	0	3	16	81	0	38	
June ..	2	0	0	3	0	0	9	39	0	5	39	0	3	0	0	1	0	0	0	0	0	0	0	0	23	77	0	53	
July ..	0	0	0	3	0	0	3	9	3	2	49	1	4	24	0	2	2	0	0	0	0	0	0	0	0	13	83	4	53
August ..	0	0	0	0	0	0	6	30	·6	6	49	·6	2	5	0	0	0	0	0	0	0	0	0	0	15	84	1	84	
September	0	0	0	0	0	0	5	35	0	5	41	0	0	14	0	0	0	0	0	0	0	0	0	0	11	89	0	55	
October..	·2	0	0	1	1	0	7	34	0	8	42	0	1	4	0	·2	0	0	0	0	0	0	0	1	18	81	0	242	
November	·5	0	0	2	·7	0	4	37	1	5	43	2	·3	3	0	0	0	0	0	0	0	0	0	0	12	84	4	199	
December	0	0	0	·8	1	0	6	46	0	5	37	0	2	1	0	·2	0	0	0	0	0	0	0	·3	14	86	0	307	

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Authorities.—Bibliography Nos. 2 and 57.

TABLE II—continued

Number of occasions per 100 on which particular winds may be expected

I=Beaufort force 1-3. II=force 4-7. III=force 8-12

20°-25° S., 55°-60° E.

Month	N.			NE.			E.			SE.			S.			SW.			W.			NW.			Calm	Totals of			No. of obs.
	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III		I	II	III	
January..	2	3	0	13	7	1	17	25	1	5	12	1	-7	2	-2	-7	2	1	1	-3	0	3	1	0	1	42	52	5	290
February	6	2	0	9	9	-2	17	28	1	9	8	-9	2	2	-3	-1	-1	0	-4	0	0	-9	-7	0	2	44	51	3	388
March ..	2	2	0	8	8	0	11	25	0	10	20	-4	4	4	-2	-7	2	0	-5	-4	0	-3	-5	0	3	36	61	-6	371
April ..	1	-7	0	5	4	0	11	24	-5	6	23	-7	4	11	-4	2	2	-1	1	1	0	-6	1	0	-8	32	66	2	595
May ..	1	3	0	5	6	0	7	16	-1	6	23	-6	6	11	-1	3	3	0	2	1	0	1	1	0	3	32	64	-8	793
June ..	1	-7	0	3	3	0	9	16	-3	11	23	1	9	11	-2	2	2	0	1	1	0	2	-7	0	2	38	58	2	748
July ..	1	-3	0	3	3	0	7	20	-2	7	27	-3	8	11	0	3	2	0	2	-7	0	1	-6	0	2	33	64	-5	752
August ..	1	1	0	6	5	0	9	19	-3	9	23	-2	6	10	-2	3	1	0	1	-8	0	-7	2	0	2	36	61	-7	845
September	1	-4	0	6	5	0	17	22	-2	10	24	1	3	6	-1	1	-8	-2	-5	-1	0	-2	0	0	1	39	58	2	560
October..	3	2	0	11	9	0	17	19	0	7	13	0	5	7	-3	-8	-2	-1	1	-2	0	3	1	0	-8	47	52	-4	501
November	4	3	0	9	7	0	16	2	0	11	13	-4	3	3	-2	-9	-2	0	-5	-4	0	4	2	0	2	48	50	-6	484
December	4	2	-8	9	9	1	17	20	-3	7	12	0	5	3	0	3	-4	0	1	-1	0	2	1	-1	2	47	48	3	581

20°-25° S., 60°-65° E.

January..	2	3	0	12	8	0	15	31	-2	5	16	0	1	3	0	-7	-3	0	-5	-5	0	1	1	0	-5	37	62	-2	598
February	0	-4	0	5	5	0	16	38	2	3	22	1	-7	5	-9	-3	-6	-5	-2	-3	0	-3	-1	0	-3	25	71	4	337
March ..	-3	2	-3	3	8	0	12	28	1	7	29	-3	1	3	0	-5	1	0	1	1	0	0	-3	0	-6	25	72	2	337
April ..	2	1	0	7	7	0	10	23	-2	4	23	1	5	8	-2	2	-6	0	1	-4	-1	2	-8	0	1	33	64	2	772
May ..	-8	2	0	5	5	0	12	23	0	5	25	0	5	9	-1	3	1	0	-8	-2	0	1	-8	0	1	32	67	-1	749
June ..	-7	-6	0	2	4	0	8	24	0	6	33	-2	4	14	0	2	-5	0	-5	-1	0	-5	-2	0	-8	23	76	-2	507
July ..	-8	-2	0	6	3	0	11	20	0	4	32	-8	5	10	-4	2	1	0	1	-3	0	-6	-3	0	-8	30	68	1	498
August ..	-4	2	0	4	4	0	8	19	0	7	30	1	6	12	-2	1	1	0	1	-4	0	-7	1	0	-3	28	70	1	621
September	1	-6	0	3	3	0	9	26	-4	8	29	1	4	8	-1	2	-6	0	2	-3	0	-2	-3	0	1	29	68	2	488
October..	1	-4	0	8	7	0	11	20	-1	7	21	-4	4	11	-1	1	1	0	-4	-4	0	-2	1	0	4	33	63	-6	485
November	4	1	0	9	7	0	14	20	0	6	21	-1	3	7	-1	-3	-7	0	2	-6	0	3	-6	0	-5	42	58	-2	593
December	3	-9	0	10	7	0	18	21	-1	7	17	0	4	5	0	-9	-8	0	-7	-3	0	2	1	0	-9	46	53	-1	953

Authorities.—Bibliography Nos. 2 and 57.

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South Indian Ocean

TABLE II—continued

Number of occasions per 100 on which particular winds may be expected
 I = Beaufort force 1-3. II = force 4-7. III = force 8-12

20°-25° S., 65°-70° E.

Month	N.			NE.			E.			SE.			S.			SW.			W.			NW.			Calm	Totals of			No. of obs.
	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III		I	II	III	
January..	.8	1	0	6	9	.4	12	36	.2	5	24	.2	1	1	0	.3	0	0	.5	1	0	1	1	0	-.4	27	72	-.8	691
February	2	1	0	6	4	0	7	37	-.3	4	31	-.3	1	2	0	.9	0	0	.5	0	0	.5	2	0	-.5	23	76	-.6	395
March ..	.4	3	0	4	8	0	9	35	0	4	30	-.2	1	3	0	.2	2	0	0	1	0	.3	4	0	2	19	79	-.2	437
April ..	1	.6	.1	8	7	0	12	29	-.1	4	25	1	3	6	.3	1	.8	.1	1	0	0	.3	1	0	-.5	30	67	2	771
May ..	2	.9	.1	3	7	0	10	23	0	5	31	0	1	8	0	3	1	0	1	.1	0	2	.6	.3	-.9	28	71	-.4	432
June ..	1	.4	0	4	2	0	4	19	-.6	7	41	2	4	6	.2	1	2	.2	.2	.8	0	2	2	0	-.4	23	73	3	247
July ..	.5	.5	0	.6	2	0	9	21	0	5	33	0	4	14	0	5	.2	0	.4	.9	0	.7	2	0	0	26	74	0	220
August ..	.4	.3	0	3	2	0	9	27	.5	5	27	2	6	11	.9	2	.2	0	.9	.3	0	.7	.4	0	1	27	68	4	282
September	.6	0	0	4	2	0	9	22	0	6	37	-.3	3	9	.4	1	1	0	.4	.6	0	2	.2	0	-.3	26	73	-.7	293
October..	.6	.4	0	7	2	0	12	23	0	3	32	2	3	8	0	2	.6	0	1	0	0	.1	.7	0	2	29	67	2	314
November	1	.7	0	6	5	0	13	29	0	7	26	0	2	5	0	.6	0	0	.8	.7	0	.2	.5	0	-.6	32	67	0	485
December	3	1	0	8	5	0	15	26	0	5	25	-.3	1	4	.2	.8	.2	.2	.7	.1	0	.8	1	0	2	35	62	-.7	742

20°-25° S., 70°-75° E.

January..	0	2	0	5	10	.7	11	35	.5	4	28	-.3	.9	2	0	.3	0	.1	.1	.2	0	0	0	0	-.2	21	77	2	759
February	2	1	0	6	9	0	11	33	.6	6	26	.4	3	2	.1	.1	.4	0	0	.2	0	.3	.7	0	-.2	27	71	1	559
March ..	.3	.1	0	3	7	.1	6	43	-.2	5	26	-.1	2	4	0	1	.2	0	1	0	0	.9	.2	0	-.2	19	80	.4	524
April ..	.7	.6	.2	4	6	0	11	30	0	6	25	.9	3	6	.8	.9	.5	0	.7	.6	0	.8	.8	0	-.6	26	71	2	628
May ..	.2	.2	0	4	10	.5	5	39	0	3	26	-.2	3	6	.3	.4	.2	0	0	0	0	2	0	0	-.5	17	82	1	214
June ..	2	4	0	.4	5	0	4	24	0	5	25	0	5	14	0	5	2	0	.4	3	0	1	1	0	-.6	22	77	0	150
July ..	.7	0	0	4	5	0	2	40	0	2	32	0	3	8	0	.7	.3	0	0	0	0	.7	0	0	2	12	86	0	152
August ..	.7	0	0	6	3	0	19	34	0	11	20	.5	2	5	0	0	0	0	0	0	0	0	0	0	-.6	38	61	-.5	194
September	3	0	0	3	.7	0	11	7	0	9	27	0	5	28	0	3	3	0	6	0	0	.3	0	0	2	33	65	0	143
October..	.3	0	0	7	4	0	12	19	0	9	26	1	7	9	0	1	1	0	1	0	0	1	0	0	1	39	59	1	197
November	2	.2	0	4	2	0	14	24	0	10	30	-.2	4	6	.2	.2	.2	0	0	0	0	0	.5	0	2	34	64	-.4	284
December	1	.7	0	8	5	0	18	33	0	6	21	0	2	2	0	2	0	0	.5	0	0	.5	0	0	-.6	37	62	0	476

Authorities.—Bibliography Nos. 2 and 57.

Table II—Wind direction and force at sea

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TABLE II—continued

Number of occasions per 100 on which particular winds may be expected

I=Beaufort force 1-3. II=force 4-7. III=force 8-12

20°-25° S., 75°-80° E.

Month	N.			NE.			E.			SE.			S.			SW.			W.			NW.			Calm	Totals of			No. of obs.
	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III		I	II	III	
January..	1	2	0	6	10	·6	14	36	·6	5	21	·6	·7	·8	0	·1	·1	·1	·8	0	·1	·4	·1	0	·5	28	70	2	434
February	0	2	0	3	10	·2	8	39	2	3	22	2	2	1	·9	·7	·1	0	·4	0	0	·1	0	·2	17	75	6	376	
March ..	1	1	0	8	5	·2	8	35	2	5	24	·9	2	·9	0	2	·3	0	·6	·5	0	1	1	0	·3	29	68	3	394
April ..	·9	3	0	4	11	0	6	37	·1	3	25	·9	2	6	·2	·2	·3	0	0	0	0	·1	·3	0	0	16	83	1	341
May ..	1	·7	0	·4	3	·6	6	25	2	9	25	·8	7	7	0	2	2	0	1	0	0	2	·2	0	5	29	63	3	229
June ..	·9	·8	·6	3	5	·2	4	31	·2	3	25	1	4	11	0	2	3	0	1	1	0	3	·4	0	·4	21	76	2	240
July ..	0	0	0	1	7	0	6	38	0	4	33	0	·7	7	0	1	·7	0	0	0	0	·7	0	0	·7	14	85	0	141
August ..	·2	0	0	2	2	0	9	39	2	2	27	2	0	5	·5	·2	4	0	·3	1	0	2	1	0	·9	15	79	5	216
September	0	0	0	0	2	0	7	27	·3	10	28	1	3	16	·4	·7	4	0	·3	0	0	0	0	0	0	20	78	2	153
October..	3	0	0	3	11	0	8	24	0	11	27	0	5	5	0	1	·6	0	0	0	0	0	0	0	1	32	67	0	87
November	0	0	0	0	7	0	20	28	0	9	28	0	2	7	0	0	0	0	0	0	0	0	0	0	0	30	70	0	59
December	·1	0	0	5	6	0	9	42	0	4	28	0	2	3	0	·5	0	0	0	0	0	·3	0	0	0	21	79	0	293

20°-25° S., 80°-85° E.

January..	0	0	0	5	7	0	11	44	1	3	25	·8	·2	1	0	·2	0	0	0	0	0	0	0	0	·7	20	78	2	301
February	3	·6	0	5	8	0	7	49	·3	4	15	2	·8	2	·4	·5	·6	·5	0	·8	0	0	·3	0	·9	20	76	3	339
March ..	1	2	0	2	10	·1	4	47	1	2	23	·6	1	2	·2	·2	·4	0	·3	·2	0	·8	·6	0	·7	13	85	2	399
April ..	3	3	0	2	10	0	5	42	·3	3	17	0	4	5	0	·9	·3	0	·6	0	0	·9	·3	0	2	20	78	·3	330
May ..	1	2	0	4	3	0	4	25	·4	3	17	0	11	9	0	5	4	0	3	3	0	1	2	0	·8	33	66	·4	247
June ..	2	3	0	3	3	0	2	17	5	1	37	3	3	12	0	2	3	0	0	·5	0	·7	2	0	·5	14	78	7	217
July ..	·7	·2	0	2	1	0	·2	21	1	1	41	6	2	15	0	·3	3	0	0	2	0	·4	1	0	1	7	85	7	219
August ..	·3	0	0	·6	2	0	3	35	1	1	38	1	·6	15	0	·3	·9	0	·6	0	0	·6	0	0	0	7	91	2	343
September	·7	·1	0	2	3	0	4	27	3	5	26	3	4	12	·3	1	3	0	·9	2	0	2	1	0	·6	19	73	7	365
October..	·9	·5	0	2	6	·4	10	30	2	6	21	·7	2	12	0	2	1	0	0	·4	0	·8	1	0	·8	24	72	3	235
November	·5	0	0	7	8	0	12	42	0	2	25	0	0	·5	0	·5	0	0	·5	0	0	·5	0	0	0	24	76	0	196
December	1	·3	0	3	11	·8	5	43	2	4	20	·4	2	2	1	·9	2	·2	0	·2	0	1	0	0	·8	17	78	5	256

Authorities.—Bibliography Nos. 2 and 57.

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South Indian Ocean

TABLE II—continued

Number of occasions per 100 on which particular winds may be expected
 I = Beaufort force 1-3. II = force 4-7. III = force 8-12

20°-25° S., 85°-90° E.

Month	N.			NE.			E.			SE.			S.			SW.			W.			NW.			Calm	Totals of			No. of obs.
	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III		I	II	III	
January..	.5	.4	0	4	7	.1	11	42	.3	4	24	0	1	3	0	-.3	-.4	0	-.1	0	0	-.1	0	0	-.5	22	77	-.4	420
February	3	1	0	0	5	0	7	40	0	8	25	.8	1	4	0	-.2	0	0	0	0	0	0	0	0	1	22	77	-.8	251
March ..	0	0	0	0	.9	0	1	44	0	5	42	0	2	5	0	0	0	0	0	0	0	0	0	0	4	8	92	0	109
April ..	0	1	0	4	5	0	4	41	0	2	28	0	3	7	0	-.6	0	0	-.7	0	0	0	0	0	0	40	60	0	77
May ..	0	0	0	1	2	0	5	19	0	15	19	0	14	7	0	-.7	10	0	2	4	0	2	0	0	0	40	60	0	70
June ..	0	0	0	0	2	0	0	15	0	2	39	0	10	26	0	2	0	0	4	0	0	0	0	0	0	19	81	0	48
July ..	0	5	0	0	0	0	2	3	0	0	38	0	.8	30	0	3	9	0	2	3	0	0	5	0	2	7	91	0	59
August ..	0	0	0	0	3	0	1	33	0	9	38	0	3	12	0	0	-.8	0	0	0	0	0	0	0	0	13	87	0	68
September	.5	.5	0	3	5	0	9	20	0	4	23	.5	2	13	1	1	3	0	2	3	0	3	5	0	1	24	73	2	201
October..	0	.4	0	1	3	0	4	42	.7	9	27	0	5	3	0	-.9	-.9	.2	-.5	-.2	-.6	1	-.4	0	1	21	76	2	280
November	1	0	0	5	6	0	10	31	0	3	23	0	3	11	0	1	2	0	-.7	1	0	0	-.7	0	1	25	74	0	298
December	2	.3	0	5	4	-.2	10	44	-.8	6	19	-.1	2	2	0	-.9	-.2	0	-.7	0	0	-.8	0	0	2	27	70	1	446

20°-25° S., 90°-95° E.

January..	2	.3	0	.9	3	0	8	23	0	15	32	0	6	3	0	2	0	0	1	0	0	2	-.3	0	2	36	62	0	159	
February	0	0	0	-.7	1	0	4	35	0	5	36	0	6	4	0	3	-.8	0	1	0	0	1	0	0	2	21	77	0	138	
March ..	0	0	0	-.9	0	0	-.4	31	-.9	10	43	0	7	6	0	-.5	0	0	0	0	0	0	0	0	0	18	82	0	100	
April ..	3	5	0	5	13	0	7	34	0	3	29	0	0	1	0	0	0	0	0	0	0	0	0	0	0	4	41	55	0	75
May ..	8	3	0	8	4	0	6	12	0	6	11	0	6	8	0	4	9	0	2	5	0	1	3	0	0	75	25	0	20	
June ..	0	0	0	5	0	0	47	7	0	23	15	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20
July ..	0	0	0	3	0	0	24	8	10	24	17	8	3	1	0	0	0	0	0	0	0	0	0	0	3	53	26	18	38	
August ..	0	0	0	0	2	0	0	19	0	0	60	0	0	16	0	0	0	0	0	3	0	0	0	0	0	0	7	93	0	60
September	0	0	0	-.8	8	0	3	41	0	0	33	0	0	7	0	0	2	0	2	2	0	2	0	0	0	3	16	81	0	162
October..	-.6	-.3	0	5	4	0	5	39	0	4	31	0	1	3	0	0	1	0	0	1	0	0	-.3	0	3	16	81	0	162	
November	2	.8	0	-.9	5	0	6	34	-.3	9	27	-.9	4	4	0	-.9	0	0	-.9	0	0	0	-.9	0	3	25	71	1	169	
December	0	0	0	2	-.4	0	13	28	0	10	32	0	4	8	0	2	-.2	0	-.4	-.6	0	0	-.2	0	-.4	30	69	0	251	

Authorities.—Bibliography Nos. 2 and 57.

Table II—Wind direction and force at sea

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TABLE II—continued

Number of occasions per 100 on which particular winds may be expected

I = Beaufort force 1-3. II = force 4-7. III = force 8-12

25°-30° S., 55°-60° E.

Month	N.			NE.			E.			SE.			S.			SW.			W.			NW.			Calm	Totals of			No. of obs.
	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III		I	II	III	
January ..	4	5	-6	10	14	1	13	23	-4	2	8	0	2	4	-2	1	-9	-1	2	1	-1	3	2	-8	-7	38	58	3	852
February ..	3	2	-1	9	11	0	12	33	0	2	14	-1	3	2	-5	1	-4	0	-5	-7	0	2	3	-1	-8	33	66	-7	512
March ..	3	2	-1	6	8	-6	11	23	-4	6	16	-8	4	9	-2	1	1	0	-5	1	-1	2	1	-2	2	34	62	2	497
April ..	1	2	0	6	6	0	12	18	-1	9	15	-7	8	11	-2	3	2	0	-9	2	0	1	2	0	1	41	57	1	489
May ..	2	6	0	3	11	-3	4	10	1	4	11	-3	7	8	-1	3	3	-2	4	5	-3	5	7	-3	4	33	60	3	300
June ..	5	5	-3	8	5	0	7	11	0	3	7	0	6	9	-6	-9	4	1	3	4	-9	4	6	-3	7	38	51	4	162
July ..	3	6	-5	3	4	0	5	16	1	3	13	-6	2	7	0	3	7	0	4	9	0	5	10	0	-6	27	70	2	186
August ..	1	9	-5	5	6	0	10	21	-6	4	13	-5	2	7	1	2	4	-9	-8	3	0	2	6	-4	1	27	68	4	316
September	3	9	0	3	7	0	9	15	0	10	11	0	7	7	0	4	2	0	2	-5	-2	3	4	-3	2	43	55	-5	215
October	4	2	0	12	8	-2	11	17	1	5	8	0	4	4	-2	3	2	-2	3	5	-2	4	3	-6	3	46	49	2	253
November	6	4	0	8	8	0	11	14	0	7	15	0	3	6	0	4	1	0	3	-6	0	6	3	0	1	48	51	0	327
December	3	5	-2	7	8	-1	11	20	-1	5	14	-2	4	5	0	2	1	-1	2	-9	-2	3	6	-3	1	37	61	1	649

25°-30° S., 60°-65° E.

January ..	2	3	-2	11	12	-2	15	31	-1	4	10	1	1	3	1	1	-3	-1	1	-3	0	2	-3	0	-6	37	60	3	480
February ..	3	-8	0	6	9	0	19	33	1	3	12	-5	2	4	-3	-2	0	-3	-3	0	0	2	-3	0	3	35	59	3	314
March ..	4	3	-1	5	5	-2	11	22	0	5	19	0	4	8	0	2	2	0	2	2	0	3	2	-3	2	35	62	-6	315
April ..	4	4	0	7	12	0	10	22	0	5	6	1	7	8	-4	3	1	0	1	-8	0	2	3	0	2	40	56	2	249
May ..	4	3	0	8	8	0	10	15	-4	3	10	1	3	8	0	6	3	0	2	3	0	5	5	0	3	41	55	1	120
June ..	15	6	0	6	2	0	8	5	0	9	10	0	20	3	0	-9	3	0	-8	0	0	2	6	2	3	61	34	2	59
July ..	3	5	0	1	3	0	5	11	-7	5	19	-7	5	12	0	1	8	0	5	5	0	5	4	0	1	31	67	1	74
August ..	4	8	0	3	2	0	8	15	0	5	13	0	4	6	0	2	2	0	7	3	0	5	11	0	-7	41	58	0	127
September	5	7	0	6	2	0	10	11	0	5	15	0	6	12	0	-7	3	0	3	4	0	5	6	0	0	40	60	0	188
October	4	4	0	8	2	0	7	12	0	3	10	0	4	7	0	6	2	0	6	4	0	8	11	0	1	46	53	0	148
November	7	6	0	3	2	0	10	12	0	3	14	0	2	2	0	2	3	0	6	5	-6	9	11	0	1	43	55	-6	172
December	5	8	-8	5	10	-8	13	17	1	9	12	0	4	2	0	-4	-2	0	2	-1	0	5	4	-2	-7	43	53	3	267

Authorities.—Bibliography Nos. 2 and 57.

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TABLE II—continued

Number of occasions per 100 on which particular winds may be expected

I = Beaufort force 1-3. II = force 4-7. III = force 8-12

25°-30° S., 65°-70° E.

Month	N.			NE.			E.			SE.			S.			SW.			W.			NW.			Calm	Totals of			No. of obs.
	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III					
January..	2	3	.9	5	13	.6	7	37	.4	2	17	.4	1	5	0	1	.4	.2	.4	.2	.6	.2	2	0	.4	19	77	3	255
February	2	.7	.2	7	18	1	15	38	1	4	4	0	1	.8	0	.8	0	0	1	0	.5	.5	.5	1	3	32	61	4	197
March ..	5	3	.2	13	8	0	12	21	.3	7	14	.4	3	3	0	2	.1	0	2	1	0	1	2	.1	2	45	52	1	302
April ..	5	3	0	6	10	0	4	14	0	4	18	0	8	7	0	3	4	0	2	1	0	1	3	0	6	33	61	0	93
May ..	3	2	.6	3	6	1	10	9	.6	8	9	0	8	5	0	12	.6	0	6	4	2	2	6	2	2	52	40	.6	87
June ..	0	0	0	0	0	0	1	0	0	1	15	0	9	23	0	5	17	0	1	5	0	0	17	6	0	18	76	6	33
July ..	5	4	2	5	1	0	9	11	0	5	6	2	12	6	.8	11	4	0	0	6	0	0	6	2	2	47	44	7	66
August ..	8	4	0	4	8	0	1	17	0	1	17	0	1	3	0	.9	2	0	1	6	0	6	16	0	3	25	72	0	105
September	14	3	0	6	3	0	7	11	0	8	17	0	5	9	0	4	.8	0	4	1	0	5	3	0	0	52	48	0	116
October	5	12	0	6	2	0	4	11	0	2	13	0	3	5	0	3	1	0	3	9	0	9	9	0	3	35	62	0	138
November	13	12	0	9	16	0	3	10	0	2	9	0	2	4	0	0	3	0	3	4	0	4	3	0	3	36	61	0	127
December	5	3	.5	9	12	0	7	15	0	8	9	0	4	8	.2	2	1	.3	3	3	0	3	1	.5	5	41	52	2	199

25°-30° S., 70°-75° E.

January..	6	4	.9	11	6	.5	7	26	0	4	20	0	2	4	0	.8	2	0	.6	.9	0	1	.7	.4	2	33	63	2	215
February	0	0	0	.6	1	.6	11	24	4	9	34	.6	1	12	0	.6	0	0	.6	0	0	0	0	0	0	24	71	5	84
March ..	3	4	3	5	14	1	12	20	.6	4	14	0	3	.6	0	6	.5	0	.9	2	0	1	3	.3	3	35	57	5	285
April ..	3	9	0	3	12	0	3	38	0	7	8	0	3	3	0	.8	.4	0	3	.4	0	3	3	0	0	26	74	0	128
May ..	2	6	0	4	10	0	2	26	0	1	10	0	3	5	0	3	3	0	3	6	0	2	14	0	0	19	81	0	132
June ..	4	2	0	1	5	.5	2	13	.5	2	14	0	3	18	0	4	11	0	6	2	0	7	4	0	0	30	69	1	105
July ..	1	.9	0	1	1	0	8	19	.3	7	20	.3	7	6	0	5	8	0	4	1	0	.8	6	0	3	35	61	.6	176
August ..	2	2	0	1	.5	0	14	13	1	11	19	0	6	5	0	3	3	0	5	2	0	7	1	0	3	50	46	1	100
September	7	12	0	10	13	0	6	5	0	9	16	0	0	12	0	0	8	0	0	0	0	0	2	0	0	31	69	0	45
October	4	6	0	3	14	0	5	5	0	7	3	0	6	6	0	5	6	0	.5	4	0	3	18	0	3	34	63	0	118
November	23	8	0	14	1	0	14	5	0	6	8	2	0	5	0	0	5	1	0	0	1	2	1	0	2	60	33	5	42
December	5	2	0	10	8	0	19	17	0	11	9	.3	4	3	1	.7	0	.4	1	.3	0	3	1	.7	1	55	41	3	139

Authorities.—Bibliography Nos. 2 and 57.

Table II—Wind direction and force at sea 8 91

TABLE II—continued

Number of occasions per 100 on which particular winds may be expected

I=Beaufort force 1-3. II=force 4-7. III=force 8-12

25°-30° S., 75°-80° E.

Month	N.			NE.			E.			SE.			S.			SW.			W.			NW.			Calm	Totals of			No. of obs.
	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III		I	II	III	
January..	3	4	.9	10	8	1	8	27	2	2	13	.3	2	5	0	.9	1	0	2	.9	0	4	2	1	.5	32	62	5	183
February	2	5	.5	4	11	0	6	43	1	1	8	.5	1	3	0	2	3	0	1	2	.2	.7	2	.7	1	20	76	3	215
March ..	6	4	0	4	11	.2	6	28	.6	3	14	0	3	5	0	2	1	0	.8	3	0	2	3	0	3	27	69	.8	244
April ..	2	7	0	6	15	.4	3	30	0	4	12	0	3	5	0	2	2	0	2	0	0	2	1	0	2	25	73	.4	276
May ..	5	6	.3	5	14	1	2	15	.6	2	6	.2	4	3	.8	6	5	.5	4	4	0	4	5	.7	7	33	56	4	308
June ..	2	6	0	3	4	0	2	10	0	2	19	0	3	19	.3	2	13	.3	1	5	0	3	5	0	0	18	81	.6	320
July ..	.6	4	0	1	1	0	.5	14	.8	4	19	2	7	15	1	5	8	.2	4	4	0	3	4	0	2	25	69	4	260
August ..	2	6	0	1	5	0	3	13	0	3	17	0	3	16	.4	2	5	.2	2	6	0	3	8	0	3	20	77	.6	299
September	4	5	.5	3	6	.2	8	13	0	3	12	0	3	10	0	3	9	.2	2	5	.2	2	5	0	4	29	66	1	274
October..	4	7	0	5	7	0	9	6	0	17	7	0	11	4	0	2	2	0	1	4	0	6	6	0	4	54	42	0	107
November	7	7	0	5	1	0	3	11	0	1	23	0	0	15	0	2	3	0	0	4	0	10	6	0	0	29	71	0	48
December	5	1	0	7	3	0	9	29	0	4	18	0	2	2	0	3	.2	0	5	1	0	6	.2	0	4	41	55	0	199

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South Indian Ocean

25°-30° S., 80°-85° E.

January..	5	3	0	10	11	0	8	29	.5	2	11	0	2	5	.3	2	2	0	2	.1	0	3	2	0	1	34	64	.8	378
February	4	4	0	5	10	0	8	38	0	2	15	2	1	2	2	.6	0	.2	.6	.2	0	2	2	0	2	23	71	4	238
March ..	5	3	0	4	8	0	7	32	.1	5	21	1	1	3	0	.3	2	0	1	.2	0	2	2	0	3	25	71	1	315
April ..	3	4	.5	5	5	0	5	23	0	3	18	0	8	6	.8	5	4	.5	1	.7	0	2	.4	0	5	32	61	2	220
May ..	2	5	0	2	5	0	6	12	.3	4	13	.3	5	11	.3	4	7	.3	3	7	0	3	6	.5	1	30	67	2	173
June ..	11	11	0	4	4	0	4	4	0	3	19	0	3	12	0	.8	3	1	2	2	0	8	3	0	3	36	59	2	202
July ..	2	7	.2	2	2	.2	3	7	0	9	10	.4	6	16	0	1	10	.4	2	5	0	4	8	0	3	30	66	1	247
August ..	3	3	0	3	1	0	3	9	0	5	12	0	5	16	0	2	11	0	2	7	0	6	9	0	2	29	69	0	370
September	4	4	0	2	2	0	5	11	0	6	14	0	6	9	0	3	5	0	4	7	0	6	9	0	1	37	62	0	413
October..	3	4	0	6	4	0	4	17	1	3	13	1	6	7	0	3	5	0	3	4	0	7	5	0	3	35	60	2	264
November	3	6	0	4	5	0	7	16	.4	6	16	1	5	5	.5	2	.6	.2	3	4	.2	5	8	0	2	35	60	3	243
December	6	2	.5	8	9	0	10	21	.3	7	12	.3	4	2	0	3	.6	0	2	2	0	7	3	.1	3	46	50	1	334

Authorities.—Bibliography Nos. 2 and 57.

TABLE II—continued

Number of occasions per 100 on which particular winds may be expected

I=Beaufort force 1-3. II=force 4-7. III=force 8-12

25°-30° S., 85°-90° E.

Month	N			NE.			E.			SE.			S.			SW.			W.			NW.			Calm	Totals of			No. of obs.
	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III					
January..	4	2	0	11	5	0	14	17	-3	6	16	-1	4	7	0	2	2	0	-9	5	0	3	2	0	3	45	52	-4	405
February	2	9	-2	5	9	-4	9	20	-3	5	22	0	4	4	0	1	-4	0	2	-2	0	4	3	0	-9	32	67	-9	219
March ..	4	7	0	2	9	0	2	24	0	0	37	0	-9	6	0	-4	2	0	3	3	0	0	3	0	0	9	91	0	107
April ..	3	7	0	7	5	0	9	17	0	4	25	0	3	7	0	-5	0	0	0	-5	0	3	4	0	5	29	66	0	101
May ..	0	6	4	0	0	0	0	18	0	9	12	0	0	1	0	10	16	0	4	13	0	0	4	1	0	23	71	6	34
June ..	6	12	0	0	-8	0	0	5	0	0	5	0	6	11	0	6	4	0	7	10	0	8	17	0	2	33	65	0	62
July ..	2	0	0	3	0	0	13	8	0	6	10	0	2	15	2	3	11	0	2	-9	0	3	7	0	12	34	52	2	59
August ..	Insufficient data																												
September	3	8	0	2	2	0	5	7	0	4	8	0	3	8	-2	6	8	1	4	7	-3	7	16	0	2	33	63	2	203
October..	2	-7	0	5	2	0	5	11	0	4	13	-1	9	14	-2	5	8	-1	3	6	-6	4	4	0	3	38	58	1	306
November	8	4	0	1	3	0	4	10	0	3	14	-1	6	6	-2	7	5	0	7	3	0	9	8	0	2	44	53	-3	327
December	6	2	0	5	5	0	9	22	0	6	12	0	7	4	-3	2	1	-4	3	2	-1	7	4	0	3	45	52	-8	543

25°-30° S., 90°-95° E.

January..	1	4	0	3	6	0	12	16	0	10	21	0	6	2	0	5	-7	0	1	1	0	0	5	0	3	40	57	0	140
February	2	3	0	4	3	0	7	17	0	7	29	0	7	7	0	2	4	0	2	-7	0	4	2	0	-7	34	65	0	147
March ..	3	1	0	6	4	0	13	29	0	7	27	0	-5	0	0	-5	1	0	1	0	0	3	0	0	4	34	62	0	96
April ..	-6	4	0	6	5	0	4	19	0	5	33	0	2	11	-5	0	5	2	0	0	0	0	3	0	2	17	79	2	86
May ..	1	1	0	2	2	0	7	17	2	11	20	6	4	2	0	3	5	0	0	5	0	2	4	0	4	31	57	8	49
June ..	Insufficient data																												
July ..	0	0	0	0	0	0	6	6	0	6	41	0	0	7	0	11	7	0	6	5	0	0	0	0	3	30	67	0	40
August ..	0	2	0	0	0	0	0	2	0	0	42	0	4	27	0	0	0	0	2	10	0	2	8	0	0	8	92	0	24
September	4	-7	0	1	0	0	3	4	0	9	15	0	3	22	0	2	9	0	11	2	0	9	3	0	1	43	56	0	72
October..	-4	-8	0	2	2	0	4	19	0	4	27	0	4	9	0	1	3	0	-4	9	0	2	9	0	2	18	80	0	122
November	1	2	0	3	4	0	6	19	0	7	17	0	3	10	0	2	2	0	5	2	0	5	9	0	3	32	65	0	139
December	6	4	0	3	2	0	3	16	0	3	20	0	4	13	0	4	-6	-8	4	4	0	8	3	0	1	35	63	-8	251

Authorities.—Bibliography Nos. 2 and 57.

Table II—Wind direction and force at sea 8 93

TABLE III—MONTHLY FREQUENCY OF WIND DIRECTION AND SPEED AT THE SURFACE

Number of occasions per 100 on which particular winds may be expected
 I = 3-13 knots (4-15 m.p.h.) II = 14-27 knots (16-31 m.p.h.) III = 28-40 knots (32-47 m.p.h.) IV = over 40 knots (over 47 m.p.h.) C = less than 3 knots (less than 4 m.p.h.)

Mauritius (Royal Alfred Obs.) 181 ft. Time of obs.: 0600 (Z-4). Period: 1927-36.

Month	N.				NE.				E.				SE.				S.				SW.				W.				NW.				C.
	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	
January ..	2	.3	0	0	6	0	0	0	33	1	0	0	23	.3	0	0	.7	0	0	0	.3	0	0	0	.3	0	0	0	.3	0	0	0	33
February ..	2	.7	0	0	2	0	0	0	31	.4	0	0	30	.4	0	0	2	0	0	0	1	0	0	0	2	0	0	0	2	.4	0	0	26
March ..	.7	.3	0	0	3	0	.3	0	32	.7	0	0	34	0	0	0	2	0	0	0	1	0	0	.3	.3	0	0	0	.3	.7	0	0	24
April ..	1	0	0	0	2	0	0	0	36	0	0	0	38	.3	0	0	2	0	0	0	.7	0	0	0	.3	0	0	0	.3	0	0	0	19
May ..	0	0	0	0	1	0	0	0	19	0	0	0	57	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	.7	0	0	0	17
June ..	0	0	0	0	2	0	0	0	20	0	0	0	61	0	0	0	4	0	0	0	.3	0	0	0	0	0	0	0	0	0	0	0	13
July ..	0	0	0	0	.3	0	0	0	23	0	0	0	60	.3	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12
August ..	0	0	0	0	.3	0	0	0	22	0	0	0	64	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	.7	0	0	0	10
September..	0	0	0	0	1	0	0	0	26	0	0	0	55	0	0	0	2	0	0	0	0	0	0	0	.3	0	0	0	0	0	0	0	16
October ..	.3	0	0	0	2	0	0	0	22	0	0	0	50	0	0	0	1	0	0	0	0	0	0	0	0	0	0	.3	0	0	0	0	24
November..	.3	0	0	0	2	0	0	0	33	0	0	0	35	0	0	0	1	0	0	0	.3	0	0	0	.3	0	0	0	.3	0	0	0	28
December ..	.7	0	0	0	3	0	0	0	33	0	0	0	27	0	0	0	.3	0	0	0	0	0	0	0	.7	0	0	0	0	0	0	0	35

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South Indian Ocean

Time of obs.: 1200 (Z-4)

January ..	11	.7	0	0	19	.3	0	0	43	2	0	0	6	2	0	0	2	0	0	0	4	0	0	0	4	0	0	0	5	0	0	0	.7
February ..	5	1	0	0	17	.7	0	0	45	2	0	0	10	1	0	0	1	0	0	0	5	.7	0	0	5	.7	0	0	5	0	0	0	1
March ..	2	.7	.3	0	13	.3	0	0	48	3	0	0	19	2	0	0	1	0	0	0	3	.7	0	0	3	0	0	0	2	.7	.3	0	1
April ..	3	0	0	0	11	.7	0	0	51	4	0	0	18	3	0	0	1	0	0	0	1	.3	0	0	4	0	0	0	2	0	0	0	1
May ..	2	0	0	0	6	0	0	0	38	3	0	0	34	5	0	0	1	0	0	0	2	0	0	0	5	0	0	0	2	0	0	0	2
June ..	1	0	0	0	3	0	0	0	40	6	0	0	35	7	0	0	2	0	0	0	2	0	0	0	2	0	0	0	.3	0	0	0	2
July ..	.7	0	0	0	4	0	0	0	39	7	0	0	34	11	0	0	.3	.3	0	0	1	0	0	0	1	0	0	0	0	0	0	0	2
August ..	.3	0	0	0	6	0	0	0	42	9	0	0	25	10	0	0	1	.3	0	0	2	0	0	0	3	0	0	0	1	0	0	0	.3
September	1	.0	0	0	9	0	0	0	43	9	0	0	22	11	0	0	.3	0	0	0	.7	0	0	0	2	0	0	0	2	0	0	0	0
October ..	3	0	0	0	16	0	0	0	50	3	0	0	17	2	0	0	.7	0	0	0	2	0	0	0	3	0	0	0	3	0	0	0	.7
November..	5	0	0	0	19	0	0	0	50	4	0	0	11	1	0	0	.7	0	0	0	.7	0	0	0	4	0	0	0	4	0	0	0	.7
December ..	9	0	0	0	26	.3	0	0	46	1	0	0	5	.7	0	0	.7	0	0	0	3	0	0	0	2	0	0	0	4	0	0	0	2

TABLE III—continued

Number of occasions per 100 on which particular winds may be expected

I=3-13 knots
(4-15 m.p.h.)

II=14-27 knots
(16-31 m.p.h.)

III=28-40 knots
(32-47 m.p.h.)

IV=over 40 knots.
(over 47 m.p.h.)

C=less than 3 knots
(less than 4 m.p.h.)

Mauritius.—cont.

Time of obs.: 1800 (Z-4)

Month	N.				NE.				E.				SE.				S.				SW.				W.				NW.				C.
	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	
January ..	7	0	0	0	13	-3	0	0	43	1	0	0	17	-3	-3	0	1	0	0	0	2	0	0	0	3	0	0	0	3	-3	0	0	9
February ..	2	-4	0	0	8	-7	0	0	41	-7	0	0	24	1	0	0	2	0	0	0	5	-4	0	0	2	0	0	0	2	-7	0	0	11
March ..	2	-7	0	0	8	0	-3	0	38	-3	0	0	34	-7	0	0	1	-3	0	0	2	0	0	0	-3	-3	0	0	-3	0	-3	0	11
April ..	0	0	0	0	3	0	0	0	43	-3	0	0	36	0	0	0	1	0	0	0	-7	0	0	0	1	0	0	0	-3	0	0	0	15
May ..	0	0	0	0	1	0	0	0	24	0	0	0	52	-3	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	19
June ..	0	0	0	0	1	0	0	0	28	0	0	0	56	-3	0	0	3	0	0	0	-3	0	0	0	0	0	0	0	0	0	0	0	11
July ..	0	0	0	0	-3	0	0	0	26	0	0	0	61	0	0	0	3	0	0	0	-3	0	0	0	-7	0	0	0	0	0	0	0	9
August ..	-3	0	0	0	2	0	0	0	31	-3	0	0	55	0	0	0	3	0	0	0	-3	0	0	0	0	0	0	0	0	0	0	0	8
September..	0	0	0	0	1	0	0	0	38	0	0	0	54	1	0	0	-7	0	0	0	0	0	0	0	-3	0	0	0	0	0	0	0	5
October ..	2	0	0	0	5	0	0	0	44	0	0	0	39	0	0	0	-3	0	0	0	1	0	0	0	1	0	0	0	-3	0	0	0	7
November..	2	0	0	0	5	0	0	0	47	-3	0	0	30	0	0	0	-7	0	0	0	1	0	0	0	3	0	0	0	1	0	0	0	10
December ..	4	0	0	0	13	0	0	0	57	0	0	0	12	0	0	0	-7	0	0	0	1	0	0	0	2	0	0	0	3	0	0	0	7

Time of obs.: 2400 (Z-4)

January ..	2	-3	0	0	4	-3	0	0	36	-3	0	0	21	0	-3	0	-3	0	0	0	-7	0	0	0	0	0	0	0	1	0	0	0	34
February ..	1	-4	0	0	3	-4	0	0	30	-4	0	0	29	0	0	0	2	0	0	0	-7	0	0	0	1	0	0	0	-7	-7	0	0	30
March ..	-3	1	-7	0	3	0	0	0	30	0	0	0	35	-3	0	0	3	0	0	0	1	-3	0	0	1	0	0	0	-3	0	0	0	24
April ..	0	0	0	0	2	0	0	0	38	-3	0	0	36	-3	0	0	1	-3	0	0	-7	0	0	0	-7	0	0	0	-3	0	0	0	20
May ..	0	0	0	0	-7	0	0	0	23	0	0	0	50	0	0	0	3	0	0	0	-3	0	0	0	0	0	0	0	-3	0	0	0	23
June ..	0	0	0	0	-7	0	0	0	24	0	0	0	54	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17
July ..	0	0	0	0	1	0	0	0	22	0	0	0	59	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14
August ..	0	0	0	0	-7	0	0	0	25	-7	0	0	53	-3	0	0	3	0	0	0	0	0	0	0	0	0	0	0	-7	0	0	0	16
September..	0	0	0	0	-3	0	0	0	34	-3	0	0	51	-3	0	0	2	0	0	0	-3	0	0	0	0	0	0	0	0	0	0	0	12
October ..	-3	0	0	0	1	0	0	0	27	0	0	0	47	0	0	0	1	0	0	0	0	0	0	0	-3	0	0	0	-3	0	0	0	23
November..	-3	0	0	0	3	0	0	0	36	0	0	0	31	0	0	0	3	0	0	0	-7	0	0	0	-3	0	0	0	1	0	0	0	25
December ..	1	0	0	0	4	0	0	0	37	0	0	0	25	0	0	0	-3	0	0	0	-3	0	0	0	-3	0	0	0	-3	0	0	0	32

Authority.—Bibliography No. 55.

Table III—Wind direction and speed at the surface 8 95

TABLE IV—MONTHLY FREQUENCY OF WIND DIRECTION AND SPEED IN THE UPPER AIR
AND SEASONAL FREQUENCY AT 21,000 FEET

Number of occasions per 100 on which particular winds may be expected

I = 3-13 knots
(4-15 m.p.h.)

II = 14-27 knots
(16-31 m.p.h.)

III = 28-40 knots
(32-47 m.p.h.)

IV = over 40 knots
(over 47 m.p.h.)

C = less than 3 knots
(less than 4 m.p.h.)

Mauritius (Vacoas).

20° 18' S., 57° 30' E.

1,411 ft.

Time of obs. : variable, chiefly 0800-1200 (Z-4)

Period : 1925-37

Height above M.S.L. (feet)	N.				NE.				E.				SE.				S.				SW.				W.				NW.				C.	No. of obs.				
	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV						
	JANUARY																																					
Surface ..	0	0	0	0	15	3	0	0	25	11	0	0	8	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	37	75
3,100 ..	4	1	0	0	16	12	2	0	26	18	1	3	7	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	3	73				
4,700 ..	11	0	0	0	29	6	0	2	20	6	0	5	4	1	0	0	4	0	0	0	0	0	0	0	2	0	0	0	1	0	0	0	9	66				
8,000 ..	8	0	0	0	20	4	0	0	32	6	0	0	8	2	0	0	6	0	0	0	2	0	0	0	2	0	0	0	4	0	0	0	6	50				
11,300 ..	20	0	0	0	17	9	0	0	3	9	0	0	12	9	0	0	6	0	0	0	0	0	0	0	3	0	0	0	6	0	0	0	6	34				
14,500 ..	0	0	0	0	24	0	0	0	12	4	0	0	4	0	4	0	16	0	0	0	0	0	0	0	8	0	0	0	8	0	0	0	20	25				
17,800 ..	6	0	0	0	28	0	0	0	5	0	0	0	17	5	0	0	0	0	0	0	5	0	0	0	17	0	0	0	6	0	0	0	11	18				
FEBRUARY																																						
Surface ..	1	0	0	0	6	0	0	0	35	12	0	0	14	7	0	0	3	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	21	95				
3,100 ..	2	1	0	0	10	3	0	0	19	33	2	1	6	10	1	0	2	1	0	0	3	1	0	0	1	0	0	0	1	1	0	0	2	94				
4,700 ..	2	0	0	0	5	7	1	0	20	22	4	0	9	8	0	0	1	0	0	0	7	2	0	0	1	0	0	0	2	1	0	0	8	91				
8,000 ..	2	0	0	0	3	7	0	0	24	4	0	0	10	3	0	0	9	0	0	0	5	0	0	0	7	0	0	0	10	2	0	0	14	58				
11,300 ..	7	0	0	0	7	0	0	0	14	21	0	0	12	5	0	0	5	3	0	0	7	0	0	0	7	5	0	0	2	0	0	0	5	43				
14,500 ..	3	0	0	0	3	0	0	0	16	0	0	0	16	7	0	0	10	0	0	0	10	0	0	0	16	3	0	0	3	3	0	0	10	31				
17,800 ..	9	0	0	0	5	0	0	0	13	0	4	0	13	4	0	0	0	0	0	0	13	4	0	0	22	5	0	0	0	4	0	0	4	23				
MARCH																																						
Surface ..	1	0	0	0	3	2	0	0	29	7	0	0	12	8	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	36	112				
3,100 ..	4	0	0	0	9	4	0	0	13	29	4	0	7	12	2	2	2	2	0	0	2	1	0	0	2	0	0	0	1	0	0	0	4	110				
4,700 ..	3	0	0	0	11	3	0	0	17	14	0	0	18	5	0	0	3	3	0	0	2	0	0	0	5	1	0	0	3	3	0	0	9	107				
8,000 ..	8	2	0	0	7	0	0	0	25	4	0	0	16	1	0	0	3	1	0	0	5	4	0	0	5	1	0	0	5	1	0	0	7	84				
11,300 ..	1	0	0	0	5	0	0	0	22	5	0	0	12	0	0	0	3	2	0	0	12	2	0	0	6	3	0	0	3	5	0	0	19	64				
14,500 ..	7	0	0	0	11	2	0	0	13	0	0	0	11	4	0	0	5	0	0	0	9	2	0	0	13	9	0	0	4	4	0	0	6	54				
17,800 ..	15	0	0	0	9	0	0	0	6	3	0	0	9	3	0	0	0	0	0	0	6	3	0	0	16	15	0	0	12	0	0	0	3	33				
JANUARY-MARCH*																																						
21,000 ..	9	0	0	0	5	4	0	0	7	7	2	0	4	4	0	0	9	2	0	0	7	4	0	0	15	4	2	0	11	2	0	0	2	46				

* Owing to the limited number of observations at 21,000 feet the frequencies are given for the season only.

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South Indian Ocean

TABLE IV—continued

Number of occasions per 100 on which particular winds may be expected

I = 3-13 knots
(4-15 m.p.h.)

II = 14-27 knots
(16-31 m.p.h.)

III = 28-40 knots
(32-47 m.p.h.)

IV = over 40 knots
(over 47 m.p.h.)

C = less than 3 knots
(less than 4 m.p.h.)

Mauritius (Vacoas)—cont.

Height above M.S.L. (feet)	N.				NE.				E.				SE.				S.				SW.				W.				NW.				C.	No. of obs.
	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV						
APRIL																																		
Surface ..	0	0	0	0	1	0	0	0	32	12	0	0	14	12	0	0	3	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	25	118
3,100 ..	2	0	0	0	6	1	0	0	22	26	9	0	7	12	3	1	2	3	0	0	1	0	0	0	2	0	0	0	0	0	0	0	3	115
4,700 ..	7	2	0	0	10	0	0	0	20	12	1	0	13	3	1	0	6	2	0	0	3	0	0	0	4	1	0	0	1	0	0	0	13	115
8,000 ..	7	0	0	0	7	1	0	0	17	2	0	0	12	1	0	0	12	1	0	0	5	1	0	0	10	3	1	0	5	2	0	0	13	95
11,300 ..	7	0	0	0	4	0	0	0	9	0	0	0	15	0	0	0	12	0	0	0	4	3	0	0	15	5	0	0	5	10	0	0	11	74
14,500 ..	7	2	0	0	5	0	0	0	3	2	0	0	3	2	0	0	13	5	0	0	10	2	0	0	13	5	3	0	15	3	0	0	7	60
17,800 ..	9	0	0	0	3	0	0	0	3	0	0	0	15	0	0	0	3	3	0	0	6	6	0	0	10	15	3	3	0	9	0	0	12	33
MAY																																		
Surface ..	0	0	0	0	2	2	0	0	21	20	0	0	23	11	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18	119
3,100 ..	1	0	0	0	5	1	0	0	9	17	7	2	18	20	7	0	2	2	0	0	1	0	0	0	2	0	0	0	1	0	0	0	5	118
4,700 ..	5	1	0	0	4	2	0	0	8	15	4	2	11	4	0	1	12	3	0	0	6	0	0	0	5	0	0	0	3	1	0	0	13	115
8,000 ..	2	3	0	0	4	1	0	0	11	3	0	0	7	4	0	0	16	2	0	0	15	0	0	0	11	2	0	0	2	7	0	0	10	93
11,300 ..	6	1	0	0	6	0	0	0	6	5	0	0	9	6	0	0	9	0	0	0	13	0	0	0	13	6	0	0	11	5	1	0	3	67
14,500 ..	2	0	0	0	0	0	0	0	2	0	0	0	4	0	0	0	18	2	0	0	15	9	0	0	9	13	4	0	9	9	2	0	2	46
17,800 ..	0	0	0	0	0	0	0	0	0	0	0	0	8	4	0	0	8	0	0	0	0	13	0	0	4	25	9	4	13	4	4	4	0	24
JUNE																																		
Surface ..	0	0	0	0	2	1	0	0	33	12	0	0	16	11	1	0	1	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	21	135
3,100 ..	2	0	0	0	2	2	0	0	7	30	10	1	8	19	7	4	1	0	0	0	2	0	0	0	2	0	0	0	1	0	0	0	2	133
4,700 ..	1	0	0	0	5	1	0	0	14	22	13	0	8	12	2	0	7	2	0	0	3	0	0	0	3	0	0	0	2	0	0	0	5	127
8,000 ..	5	0	0	0	9	3	0	0	11	13	0	0	18	8	0	0	5	3	0	0	10	3	0	0	4	0	0	0	3	2	0	0	3	97
11,300 ..	3	0	0	0	4	3	0	0	19	7	0	0	5	13	0	0	10	2	2	0	5	3	0	0	3	5	2	0	3	8	0	0	3	60
14,500 ..	5	0	0	0	0	3	0	0	8	8	0	0	6	8	0	0	3	3	0	0	8	6	0	0	8	8	3	0	6	3	3	0	9	35
17,800 ..	0	0	0	0	0	4	0	0	0	0	0	0	8	4	0	0	11	0	0	0	8	8	4	0	8	11	15	0	11	0	8	0	0	26
APRIL-JUNE																																		
21,000 ..	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	9	2	0	0	13	7	7	0	11	22	13	5	0	5	0	0	2	45

Table IV—Wind direction and speed in the upper air 8 97

TABLE IV—continued

Number of occasions per 100 on which particular winds may be expected

I = 3-13 knots
(4-15 m.p.h.)

II = 14-27 knots
(16-31 m.p.h.)

III = 28-40 knots
(32-47 m.p.h.)

IV = over 40 knots
(over 47 m.p.h.)

C = less than 3 knots
(less than 4 m.p.h.)

Mauritius (Vacoas)—cont.

Height above M.S.L. (feet)	N.				NE.				E.				SE.				S.				SW.				W.				NW.				C.	No. of obs.
	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV						
JULY																																		
Surface ..	0	0	0	0	2	0	0	0	27	11	0	0	23	16	0	0	2	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	17	131
3,100 ..	0	0	0	0	2	2	0	0	14	30	4	1	12	14	7	1	4	2	1	0	0	0	0	0	0	1	0	0	1	0	0	0	4	129
4,700 ..	3	1	0	0	10	3	0	0	13	15	6	0	9	8	2	1	6	1	0	0	6	2	0	0	2	1	0	0	2	0	0	0	9	121
8,000 ..	5	1	0	0	5	3	0	0	14	8	0	0	10	4	0	0	9	4	0	0	4	5	1	0	6	4	0	0	3	4	0	0	10	78
11,300 ..	6	2	0	0	2	0	0	0	8	6	0	0	6	2	0	0	13	4	0	0	8	4	0	0	10	11	0	0	10	4	0	0	4	51
14,500 ..	4	0	0	0	3	0	0	0	7	7	0	0	3	3	0	0	4	7	0	0	7	3	0	0	3	14	3	0	13	3	13	0	3	30
17,800 ..	0	0	0	0	4	0	0	0	0	0	0	0	0	4	0	0	0	5	0	0	0	5	5	0	0	10	10	0	10	32	0	5	10	21
AUGUST																																		
Surface ..	0	0	0	0	1	0	0	0	36	23	0	0	15	10	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	140
3,100 ..	0	0	0	0	1	1	0	0	12	25	8	0	9	24	4	0	7	1	0	0	1	0	0	0	1	0	0	0	0	0	0	0	6	140
4,700 ..	4	1	0	0	6	1	1	0	9	16	5	1	12	11	1	1	12	1	0	0	2	0	0	0	4	1	0	0	2	0	0	0	9	128
8,000 ..	1	0	0	0	5	5	0	0	6	8	0	0	17	8	0	0	8	5	0	0	11	2	0	0	11	6	0	0	2	2	0	0	3	88
11,300 ..	5	2	0	0	3	0	0	0	7	5	0	0	7	5	0	0	16	5	0	0	9	4	0	0	12	7	2	0	4	2	2	0	3	57
14,500 ..	0	3	0	0	0	3	0	0	0	0	0	0	0	3	0	0	5	8	3	0	17	8	0	0	14	14	3	0	8	8	0	0	3	36
17,800 ..	0	0	4	0	0	0	0	0	0	0	0	0	0	4	0	0	0	4	4	0	9	13	9	0	13	22	4	0	5	5	4	0	0	23
SEPTEMBER																																		
Surface ..	0	0	0	0	1	0	0	0	44	18	0	0	9	9	1	0	1	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	14	139
3,100 ..	0	0	0	0	7	1	0	0	23	25	9	1	10	14	2	1	2	2	0	0	1	0	0	0	1	0	0	0	0	0	0	0	1	139
4,700 ..	2	0	0	0	12	1	0	0	19	14	1	2	14	7	0	0	5	2	0	0	7	1	0	0	3	0	0	0	1	0	0	0	9	136
8,000 ..	2	4	0	0	11	2	0	0	11	5	2	0	16	7	0	0	12	3	0	0	8	2	0	0	4	2	0	0	5	0	0	0	4	103
11,300 ..	4	0	0	0	4	3	0	0	13	2	0	0	15	12	0	0	13	1	0	0	13	3	0	0	6	2	1	0	1	0	0	0	7	69
14,500 ..	11	0	0	0	10	0	0	0	6	4	0	0	4	0	0	0	12	4	2	0	6	2	2	0	11	10	0	0	8	6	0	0	2	49
17,800 ..	9	0	0	0	9	0	0	0	9	0	0	0	0	3	0	0	0	3	0	0	3	9	0	0	12	20	3	0	3	9	3	0	5	34
JULY-SEPTEMBER																																		
21,000 ..	6	1	0	0	3	0	0	0	2	0	0	0	0	3	0	0	8	1	1	0	3	11	1	0	4	22	4	0	7	15	1	1	6	73

TABLE IV—continued

Number of occasions per 100 on which particular winds may be expected
 I = 3-13 knots (4-15 m.p.h.) II = 14-27 knots (16-31 m.p.h.) III = 28-40 knots (32-47 m.p.h.) IV = over 40 knots (over 47 m.p.h.) C = less than 3 knots (less than 4 m.p.h.)

Mauritius (Vacoas)—cont.

Height above M.S.L. (feet)	N.				NE.				E.				SE.				S.				SW.				W.				NW.				C.	No. of obs.				
	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV						
OCTOBER																																						
Surface ..	1	0	0	0	5	1	0	0	33	7	0	0	13	6	0	0	1	1	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0	0	0	29	165
3,100 ..	2	1	0	0	5	2	1	0	21	27	2	0	8	9	3	1	5	1	0	0	3	1	0	0	3	0	0	0	5	1	0	0	2	0	0	0	5	164
4,700 ..	5	2	0	0	9	1	0	0	18	17	1	1	9	5	1	0	11	2	0	0	3	0	0	0	3	0	0	0	5	0	0	0	2	0	0	0	8	146
8,000 ..	8	2	0	0	4	1	0	0	14	11	1	0	9	3	0	0	9	3	0	0	10	4	0	0	9	2	0	0	3	1	0	0	6	118				
11,300 ..	2	0	0	0	1	1	0	0	5	9	0	0	8	4	0	0	9	2	0	0	14	8	0	0	11	6	0	0	5	6	0	0	9	80				
14,500 ..	5	0	0	0	0	0	0	0	0	7	0	0	11	4	0	0	9	4	2	0	15	2	0	0	18	7	0	0	7	5	2	0	2	55				
17,800 ..	8	0	0	0	2	0	0	0	0	0	0	0	7	5	0	0	7	7	5	0	5	8	0	0	8	15	5	0	2	8	2	0	5	40				
NOVEMBER																																						
Surface ..	1	0	0	0	7	1	0	0	48	16	0	0	5	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	19	150				
3,100 ..	2	1	0	0	10	4	0	0	19	31	6	1	12	6	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	5	149				
4,700 ..	6	1	0	0	11	2	0	0	20	21	2	0	14	4	0	0	6	0	0	0	1	0	0	0	3	0	0	0	1	0	0	0	8	145				
8,000 ..	8	1	1	0	10	2	0	0	16	8	0	0	11	9	0	0	9	0	1	0	7	2	0	0	4	2	0	0	3	1	0	0	5	112				
11,300 ..	8	0	1	0	5	0	0	0	9	6	0	0	10	5	1	0	9	1	0	0	13	5	0	0	4	1	0	0	15	0	0	0	7	80				
14,500 ..	5	0	0	0	4	0	0	0	2	2	0	0	18	3	0	0	7	3	0	0	11	5	0	0	11	2	0	0	14	4	0	0	9	56				
17,800 ..	10	2	0	0	2	2	0	0	7	2	0	0	2	7	0	0	7	0	0	0	5	7	0	0	6	12	0	0	17	10	42							
DECEMBER																																						
Surface ..	0	0	0	0	16	2	0	0	33	9	0	0	6	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	31	109				
3,100 ..	3	1	0	0	17	9	0	0	29	22	3	1	4	1	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	108				
4,700 ..	9	0	0	0	23	2	0	0	22	14	1	0	9	1	1	0	3	0	0	0	2	0	0	0	0	0	0	0	4	0	0	0	9	103				
8,000 ..	11	3	0	0	14	1	0	0	11	7	0	0	12	1	0	0	4	1	0	0	7	0	0	0	3	0	0	0	6	0	0	0	19	73				
11,300 ..	2	0	0	0	4	0	0	0	9	7	0	0	14	7	0	0	11	0	0	0	14	0	0	0	14	0	0	0	11	2	0	0	5	56				
14,500 ..	3	8	0	0	0	0	0	0	15	2	0	0	13	0	0	0	13	0	0	0	18	0	0	0	18	0	0	0	0	0	0	0	10	39				
17,800 ..	8	0	0	0	4	0	0	0	0	4	0	0	13	0	0	0	21	0	0	0	4	4	0	0	25	4	0	0	9	0	0	0	4	24				
OCTOBER-DECEMBER																																						
21,000 ..	4	2	0	0	3	2	0	0	1	0	0	0	2	3	0	0	10	2	1	0	4	7	0	0	7	22	2	0	7	13	2	0	6	68				

Authority—Bibliography No. 55.

Table IV—Wind direction and speed in the upper air 8 99

TABLE V—VISIBILITY

Percentage frequency of different degrees of visibility

Seychelles (Mahé). 4° 37' S., 55° 27' E. 15 ft. Period : 2 years

Local time Limits of visibility (nautical miles)	1000					1600				
	0- $\frac{1}{2}$	$\frac{1}{2}$ -2	2-5	5-10	over 10	0- $\frac{1}{2}$	$\frac{1}{2}$ -2	2-5	5-10	over 10
SUMMER										
December	0	5	3	6	86	0	0	3	15	82
January	0	2	8	11	79	0	0	11	11	78
February	0	0	2	9	89	0	0	3	9	88
March	0	0	3	7	90	0	2	3	10	85
AUTUMN										
April	0	3	2	3	92	0	5	7	3	85
May	0	3	3	10	84	0	7	8	3	82
WINTER										
June	0	2	5	55	38	0	0	5	57	38
July	0	3	5	60	32	0	3	3	62	32
August	0	0	6	47	47	0	2	8	53	37
September	0	0	10	32	58	0	2	7	41	50
SPRING										
October	0	0	0	16	84	0	0	8	8	84
November	0	2	5	10	83	2	0	10	8	80

Authority.—Bibliography No. 56.

Mauritius (Royal Alfred Obs.) 20° 06' S., 57° 32' E. 181 ft. Period : 7-9 years, 1927-37

Time (Z-4) Limits of visibility (nautical miles)	0900-1000					1600				
	0- $\frac{1}{2}$	$\frac{1}{2}$ -2	2-5	5-10	over 10	0- $\frac{1}{2}$	$\frac{1}{2}$ -2	2-5	5-10	over 10
SUMMER										
December-March	3	6	20	41	30					
AUTUMN										
April-May	1	6	17	38	38					
WINTER										
June-September	0.7	7	22	43	28					
SPRING										
October-November	1	4	19	42	34					

Data not available.

Authority.—Bibliography No. 55.

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South Indian Ocean

TABLE VI—VISIBILITY AND WIND DIRECTION

Frequency of different degrees of visibility expressed as a percentage of the total number of winds from each direction

Mauritius (Royal Alfred Obs.) 20° 06' S., 57° 32' E. 181 ft. Time of obs. : 0900-1000 (Z-4). Period : 7-9 years, 1927-37

Visibility (nautical miles)	SUMMER (December-March)										AUTUMN (April-May)									
	N.	NE.	E.	SE.	S.	SW.	W.	NW.	C.	N.	NE.	E.	SE.	S.	SW.	W.	NW.	C.		
0- $\frac{1}{2}$..	3	4	2	2	0	5	3	0	8	0	4	1	1	0	0	0	0	0		
$\frac{1}{2}$ -2 ..	9	6	6	4	20	10	0	14	3	0	4	6	4	25	12	14	50	0		
2-5 ..	37	20	19	21	20	19	30	11	18	0	27	22	12	0	13	0	0	24		
5-10 ..	36	44	41	37	20	33	37	47	55	50	38	42	35	12	37	43	0	47		
Over 10 ..	15	26	32	36	40	33	30	28	16	50	27	29	48	63	38	43	50	29		
No. of obs.	59	167	508	169	5	21	27	36	38	2	26	229	218	8	8	7	4	17		
Visibility (nautical miles)	WINTER (June-September)										SPRING (October-November)									
	N.	NE.	E.	SE.	S.	SW.	W.	NW.	C.	N.	NE.	E.	SE.	S.	SW.	W.	NW.	C.		
0- $\frac{1}{2}$..	0	0	1	0	0	0	0	0	0	0	1	0	5	0	0	0	0	0		
$\frac{1}{2}$ -2 ..	0	14	7	7	0	0	0	0	0	4	5	5	5	0	0	0	0	0		
2-5 ..	0	21	26	18	31	0	20	0	27	30	16	18	18	0	28	33	13	50		
5-10 ..	50	48	43	44	37	67	60	33	28	48	46	38	45	0	29	34	67	37		
Over 10 ..	50	17	23	31	32	33	20	67	45	18	32	39	27	0	43	33	20	13		
No. of obs.	2	29	455	519	19	6	5	3	29	27	109	281	66	0	7	6	15	8		

Authority.—Bibliography No. 55.

Table VI—Visibility and wind direction

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TABLE VII—OVERCAST SKY AND TYPE OF CLOUD IN RELATION TO WIND DIRECTION

Number of days per 100 on which the sky was overcast with different types of cloud

Mauritius (Royal Alfred Obs.) 20° 06' S., 57° 32' E. 181 ft. Period: 10 years, 1927-36

Type of cloud	Time (Z-4)	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Calm	Total	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Calm	Total
		SUMMER (December to March)										AUTUMN (April to May)									
Alto-Low	0600	.6	2	7	3	.2	.4	.1	.7	7	21	.5	.5	8	8	.2	0	.2	0	7	24
"	1200	1	5	11	4	.2	.5	.5	1	4	27	.3	2	11	5	0	0	.2	.2	3	22
"	1800	1	3	7	5	.2	.5	.3	.7	8	26	.2	1	9	9	0	0	.5	.2	8	28
Mixed	0600	.1	.2	2	.8	0	0	.2	.1	3	6	0	0	2	.3	0	.2	0	0	1	3
"	1200	.7	1	3	.8	.2	.1	.3	.3	.9	7	0	.2	3	2	.2	0	0	0	.8	6
"	1800	.2	1	6	3	.1	0	.5	.2	5	16	0	.2	5	2	0	0	.2	0	3	10
St.-form	0600	.6	.2	8	3	.2	.4	.2	.7	9	24	.5	.5	9	8	.2	0	.2	0	8	26
Cu.-form	0600	.1	.2	.7	.4	0	0	.1	0	2	3	0	0	.7	.3	0	.2	0	0	.7	2
St.-form	1200	1	6	13	4	.2	.5	.6	1	4	30	.3	3	12	5	0	0	.2	.2	3	24
Cu.-form	1200	.5	.5	2	.5	.1	.1	.2	.1	.5	4	0	0	2	1	.2	0	0	0	.5	4
St.-form	1800	2	4	10	7	.2	.5	.5	1	10	35	.2	.8	11	10	0	0	.3	.2	10	33
Cu.-form	1800	0	.7	3	1	.1	0	.3	0	3	8	0	.2	2	2	0	0	.2	0	1	5
		WINTER (June to September)										SPRING (October to November)									
Low	0600	0	.2	8	12	.2	0	0	0	8	28	0	.3	5	5	0	0	0	0	9	19
"	1200	0	1	9	8	.2	.2	.2	.1	2	21	.7	3	11	5	0	.8	.3	.3	3	24
"	1800	0	.4	6	11	.2	.2	.1	0	5	23	.7	.8	10	5	.2	.7	.2	.7	9	27
Mixed	0600	0	0	.1	.4	0	0	0	0	.2	1	0	.2	.8	.7	0	0	0	0	1	3
"	1200	0	.2	1	.4	0	0	0	0	.2	2	.2	.7	2	.5	0	0	0	.2	0	4
"	1800	.1	0	.8	.4	0	0	0	0	.2	2	0	.3	2	.2	0	0	0	0	1	5
St.-form	0600	0	.2	8	12	.2	0	0	0	8	28	0	.3	5	5	0	0	0	0	10	20
Cu.-form	0600	0	0	.1	.3	0	0	0	0	.2	1	0	.2	.5	.5	0	0	0	0	1	2
St.-form	1200	0	1	10	8	.2	.2	.2	.1	2	22	.8	3	13	5	0	.8	.3	.5	3	26
Cu.-form	1200	0	.1	.7	.2	0	0	0	0	.2	1	0	.3	.7	.2	0	0	0	0	0	1
St.-form	1800	.1	.4	7	11	.2	.2	.1	0	5	24	.5	.8	10	7	.3	.3	.3	.7	9	29
Cu.-form	1800	0	0	.7	.3	.2	0	0	0	.2	1	0	.2	1	.7	0	0	0	0	.3	2

Authority.—Bibliography No. 55.

Notes.—For the purpose of this table an overcast sky is defined as a sky of which 9 or 10-tenths is covered with cloud. Low cloud refers to cloud below the alto-level. Mixed cloud indicates sky overcast with cloud at different levels (low, middle, high) of which at least 2-tenths was low cloud. St.-form includes St., Stcu., Nbst. Cu.-form includes Cu., Cumb.

TABLE VIII—SEA AND SWELL IN RELATION TO WIND DIRECTION

Number of days per 100

Owing to the surrounding reef the observations give little detail. Rough signifies breakers on the reef.

Mauritius		Period : 1927-36																			
Time of observation (Z-4)		CAVES POINT LIGHTHOUSE (NW. COAST)*										GRAND BAY (NORTH COAST)									
		1000										0700									
Season	Swell	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Total	Sea	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Total	
SUMMER (Dec.-Mar.)	Calm or slight ..	3	12	43	15	1	1	2	3	80	Calm to moderate	2	6	42	39	4	1	1	1	1	96
	Moderate swell ..	1	3	6	1	-1	0	-6	-2	12	Rough	-4	1	-8	1	-1	-2	-2	-4	4	
	Heavy swell ..	1	3	2	-4	-1	-2	-8	-6	8											
AUTUMN (April-May)	Calm or slight ..	1	7	41	33	3	1	2	-4	89	Calm to moderate	-4	2	30	58	6	-7	-5	-2	98	
	Moderate swell ..	0	0	4	5	-2	0	-2	0	9	Rough	0	0	-2	1	0	0	-2	0	2	
	Heavy swell ..	-4	-4	0	1	-4	-2	0	0	2											
WINTER (June-Sept.)	Calm or slight ..	-5	3	44	40	3	-5	-6	-3	92	Calm to moderate	-2	-9	25	68	5	-2	-3	-1	99	
	Moderate swell ..	-1	0	3	3	-2	-1	0	-1	7	Rough	0	0	-1	-4	0	0	0	0	1	
	Heavy swell ..	0	0	-7	-4	-1	0	0	0	1											
SPRING (Oct.-Nov.)	Calm or slight ..	3	14	53	17	-7	-7	1	2	92	Calm to moderate	-5	3	35	56	3	-2	-5	1	99	
	Moderate swell ..	-8	1	2	1	0	0	0	-5	6	Rough	0	0	-5	0	0	0	-2	0	1	
	Heavy swell ..	-3	-8	-2	-3	0	0	-2	-3	2											
Time of observation (Z-4)		BLACK RIVER (WEST COAST)										PORT SOUILLAC (SOUTH COAST)									
		0700										0700									
Season	Sea	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Total	Sea	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Total	
SUMMER (Dec.-Mar.)	Calm to moderate	1	5	40	39	3	-7	-9	1	90	Calm to moderate	1	4	36	38	3	-8	1	1	85	
	Rough	-7	1	2	3	1	-7	-4	-6	10	Rough	-7	-8	5	6	1	-7	-3	-5	15	
AUTUMN (April-May)	Calm to moderate	0	2	29	55	6	-5	-5	-2	93	Calm to moderate	-2	2	25	51	6	-5	-4	-2	85	
	Rough	-4	-4	-9	4	-7	-2	-2	0	7	Rough	-2	-2	5	8	1	-2	-4	0	15	
WINTER (June-Sept.)	Calm to moderate	-2	1	24	61	4	-2	-3	-1	91	Calm to moderate	-2	-9	18	56	4	-2	-2	-1	80	
	Rough	0	0	1	7	1	-1	0	0	9	Rough	0	0	6	13	1	-1	-1	-1	20	
SPRING (Oct.-Nov.)	Calm to moderate	-2	3	35	55	2	0	-5	-8	97	Calm to moderate	-3	3	31	50	2	-2	-5	1	88	
	Rough	-3	0	-7	1	-5	-2	-2	-2	3	Rough	-2	-2	4	7	-5	0	0	0	12	

Authority.—Bibliography No. 55.

* The exposure is open from NNE. through N. to SSW., i.e. it is on the lee side of the island for the prevailing trade wind.

Table VIII—Sea and swell in relation to wind direction 8 103

BIBLIOGRAPHY

GENERAL CLIMATOLOGY, ATLASES, ETC.

1. London, Admiralty, Hydrographic Department. South Indian Ocean Pilot, 5th edn., 1934.
2. London, Meteorological Office. Monthly meteorological charts of the East Indian Seas.
3. Ditto, Notes upon average conditions in the Indian Ocean, North of Latitude 35° S. *London, Mar. Obs.*, **2**, 1925 (monthly).
4. Simla, Meteorological Department of the Government of India. Meteorological Atlas of the Indian Seas and the North Indian Ocean. Simla, 1908.
5. Washington, D.C., Hydrographic Office. Pilot charts of the Indian Ocean, 1938.
6. Hamburg, Deutsche Seewarte. Monatskarte für den Indischen Ozean, 1908.
7. Ditto, Indischer Ozean. Ein Atlas von 35 Karten, 1891.
8. Ditto, Dampferhandbuch für den Indischen Ozean, 1937.
9. Utrecht, K. Nederlandsch Meteorologisch Instituut. Klimatologie van den Indischen Oceaan, by P. H. Gallé. *Meded. ned. met. Inst.*
I—Luchtdrukking, II—Wind, III—Stroom, No. 29a, 1924.
IV—Temperatuur van Water en Lucht, No. 29b, 1928.
V—Neerslag, VI—Frequentie van Luchtdrukkingen en stormachtige Winden, VII—Tropische Cyclonen, No. 29c, 1930.
10. SCHOTT, G.; Geographie des Indischen und Stillen Ozeans. Hamburg, C. Boysen, 1935.
11. HANN, J.; Handbuch der Klimatologie, 3 Auflage, Band 2, Stuttgart, 1910.
12. Washington, D.C., Smithsonian Institution. World weather records. *Washington, Smithson. misc. Coll.*, **79**, 1927 and **90**, 1930.

LOCAL CLIMATOLOGY

Diego Garcia

13. BOURNE, G. C.; On the island of Diego Garcia of the Chagos group. *London, Proc. R. geogr. Soc.*, **8**, 1886, p. 385.
14. London, Meteorological Office. Preliminary report on conditions at Diego Garcia. *Airship Met. Rep.* No. 43, 1927.

Mauritius

15. CLAXTON T. F.; Climate of Pamplemousses, in the island of Mauritius. *8th Int. geogr. Congr.*, p. 352.
16. London, Meteorological Office. Preliminary report on conditions at Mauritius. *Airship Met. Rep.* No. 30, 1927.
17. HERCHENRODER, M.; The atmospheric pressure at Mauritius. *Misc. Publ. R. Alfred Obs., Mauritius*, No. 18, 1937.
18. Ditto, Air temperature and humidity data at Mauritius. *Ibid.*, No. 21, 1938.
19. WALTER, A.; The sugar industry of Mauritius. Arthur L. Humphreys, London, 1910.

Réunion

20. HANN, J.; Resultate meteorologischer Beobachtungen im Jahre 1892 zu Saint Denis. *Braunschweig, Met. Z.*, **12**, 1895, p. 316.
21. Ditto, Meteorologische Beobachtungen auf der Insel Réunion, *Ibid.*, **25**, 1908, p. 367.
22. MAILLARD, M.; Météorologie de l'île Bourbon. *Annu. Soc. mét. Fr. Paris*, **10**, 2ième Partie, Bulletin des Séances, 1862, p. 35.

Seychelles

23. GARDINER, J. S.; The Seychelles archipelago. *London, Geogr. J.*, **29**, 1907, p. 148.

CYCLONES AND DEPRESSIONS

24. Mauritius, Royal Alfred Observatory. The cyclone season. Published annually from 1927-8 onwards. *Misc. Publ. R. Alfred Obs.*, Nos. 7, 10, 12, 13, 15, 16, 17, 19, 20, 22.
25. NEWNHAM, MRS. E. V.; Hurricanes and tropical revolving storms. *London, Geophys. Mem.*, **2**, No. 19, 1922.

SURFACE WINDS

26. London, Meteorological Office. The trade winds. II—Atlantic, Pacific and Indian oceans. *Mar. Obs.*, **5**, 1928, p. 99.
27. Ditto, The monsoons. II—The Monsoons of the Indian Ocean, China Seas and the eastern Mediterranean. *Ibid.*, **6**, 1929, p. 130.
28. Ditto, Local winds, Indian Ocean. V—Islands of the Indian Ocean. *Ibid.*, **5**, 1928, p. 212.
29. Ditto, Squalls in the doldrums. *Ibid.*, **5**, 1928, p. 5.
30. Ditto, Squalls at sea—II, by E. W. Barlow, *Ibid.*, **7**, 1930, p. 43.
31. Ditto, Descriptions of squalls in the South Indian Ocean are given in *Ibid.*, **5**, 1928, p. 179; and **13**, 1936, p. 6.
32. DEPPERMANN, C. E.; The mean transport of air in the Indian and South Pacific Oceans, Manila, Philippine Weather Bureau, 1935.

UPPER WINDS

33. WATSON, R. A. AND McCURDY, N. R.; Pilot balloon observations at Mauritius. *Misc. Publ. R. Alfred Obs., Mauritius*, No. 11, 1930.
34. WALTER, A.; Results of observations on the direction and velocity of the upper air current over the South Indian Ocean. *London, Geophys. Mem.*, **4**, No. 39, 1927.
35. WATSON, R. A.; Nephoscope observations at Mauritius. *London, Quart. J. R. met. Soc.*, **53**, 1927, p. 446.
36. HUBERT, H.; Les mouvements généraux de l'air atmosphérique au-dessus des colonies françaises. *Paris, Ann. Phys. Globe France d'Outre Mer*, **2**, 1935, p. 73.

CLOUD

37. SCHOTT, G.; Die Bewölkung über dem Indischen und Stillen Ozean. *Berlin, Ann. Hydrogr.*, **61**, 1933, p. 280.

RAINFALL

38. SCHOTT, G. ; Die jährlichen Niederschlagsmengen auf dem Indischen und Stillen Ozean. *Berlin, Ann. Hydrogr.*, **61**, 1933, p. 1.
39. DANCKELMAN, A. v. ; Regen, Hagel und Gewitter im Indischen Ozean. *Hamburg, Aus. d. Arch. dtsh. Secw.*, **3**, 1880.
40. HERCHENRODER, M. ; La pluie à l'île Maurice. Port Louis, Mauritius, 1935.
41. WALKER, G. T. ; Monthly and annual rainfall normals. *Simla, Indian met. Mem.*, **22**, No. 1, 1913.
42. HUBERT, H. ; Les précipitations annuelles dans les territoires d'outre mer de la zone intertropicale. *Paris, Ann. Phys. Globe France d'Outre Mer.*, **4**, 1933, pp. 96, 129 and 137.

TEMPERATURE OF THE AIR AND SEA

43. KEETON, H. ; Mean sea surface temperatures. Indian Ocean. *London, Mar. Obs.*, **5**, 1928, p. 257 (with monthly charts).
44. GALLÉ, P. H. ; Luft und Wassertemperatur im Indischen Ozean. *Utrecht, Meded. ned. met. Inst.*, **18**, 1914.

HUMIDITY

45. SZÁVA-KOVÁTS, J. ; Verteilung der Luftfeuchtigkeit auf der Erde. *Berlin, Ann. Hydrogr.*, **66**, 1938, p. 373.

MISCELLANEOUS

46. BROOKS, C. E. P. ; The distribution of thunderstorms over the globe. *London, Geophys. Mem.*, **3**, No. 24, 1925.
47. FLETCHER, L. E. ; Waterspouts. *London, Mar. Obs.*, **9**, 1932, p. 153.
48. London, Meteorological Office. Descriptions of waterspouts in the Indian Ocean are given in *London, Mar. Obs.*, **6**, 1929, p. 218 and **8**, 1931, pp. 61, 252.

DAILY, MONTHLY AND ANNUAL REPORTS, ETC.

49. Mauritius, Royal Alfred Observatory. *Results of the magnetical and meteorological observations.*
50. Ditto. *Annual Report of the Director.*
51. Paris, Bureau Central Météorologique. *Annales*, 2ième Partie, 1906-10.
52. Poona, India Meteorological Department. *Monthly Weather Review.*
53. Seychelles, Meteorological observations taken at Seychelles island.
54. Tananarive, Service Météorologique Madagascar, *Observations météorologiques.*
55. MS. data supplied by the Royal Alfred Observatory, Mauritius.
56. MS. data supplied by the India Meteorological Department, Poona.
57. MS. data in Meteorological Office, London.