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Author	Johnston, Henry Halcro
Qualification	MD
Year	1893

REPORT ON THE RELATION BETWEEN MALARIAL FEVER AMONG HER MAJESTY'S WHITE TROOPS AT PORT LOUIS, MAURITIUS, AND THE METEOROLOGICAL ELEMENTS OF TEMPERATURE, RAINFALL, AND RELATIVE HUMIDITY FOR THE YEAR 1889; WITH A PRELIMINARY SKETCH OF THE MEDICAL TOPOGRAPHY OF THE ISLAND AND THE EPIDEMIC OF MALARIAL FEVER IN 1866-67.

BY

SURGEON-MAJOR H. H. JOHNSTON,

ARMY MEDICAL STAFF, D.SC., M.D., C.M., F.L.S.,

FELLOW OF THE BOTANICAL SOCIETY OF EDINBURGH, PRESIDENT OF THE SCOTTISH NATURAL HISTORY SOCIETY.

EDINBURGH:

1ST AUGUST 1894.

Report on the Relation between Malarial Fever among Her Majesty's White Troops at Port Louis, Mauritius, and the Meteorological Elements of Temperature, Rainfall, and Relative Humidity for the Year 1889; with a Preliminary Sketch of the Medical Topography of the Island and the Epidemic of Malarial Fever in 1866-67.

MAURITIUS was discovered by the Portuguese in 1505. The first colony was formed on it by the Dutch in 1644, but they abandoned the island in 1712. The French took possession in 1715, and held Mauritius until 1810, when it was captured from them by the British, who have held uninterrupted possession ever since that year.

The island of Mauritius is situated in the Indian Ocean, 500 miles east of Madagascar, between lat. 19° 58′ and 20° 32′ south, and between long. 57° 17′ and 57° 46′ east of Greenwich.

It is a mountainous oceanic island, of volcanic origin, but no active volcano has been known within the memory of man. The geological formation consists of vesicular basalt, rich in olivine, which on decomposing forms a very porous ferruginous red earth, similar to that at Sierra Leone, on the west coast of Africa. The soil formed from the decomposition of this kind of rock appears to be peculiarly suitable for the development of malaria. The island has an area of 713 square miles, its greatest length from north to south being 39 miles, and its breadth from east to west 28 miles. The coast is fringed with coral reefs, and in its immediate vicinity there is a considerable number of small islets of coral and volcanic formation. The northern part of the island is a low plain, at one time covered with sugar-cane plantations, but now mostly abandoned on account of the deficient water supply, due to the learance of the virgin forests from the centre of the island.

The centre consists of an elevated cultivated plateau, 1,000 to 2,000 feet above sea level. On the outside of this central plateau, within a short distance of the sea, rise the three principal mountain ranges which the island contains. The mountains are bold and rugged, and mostly range between 2,000 and 2,711 feet above sea level.

The only two lakes of any consequence are the Grand Bassin and Mare aux Vacoas, situated at the south-west part of the central plateau. The former is a deep pool, about half-a-mile across, and it appears to occupy the crater of an extinct volcano. The latter is a shallow sheet of water, about a mile long, and surrounded by swampy margins. The water supply of the villages in the lower part of the district of Plaines Wilhems is derived from the Mare aux Vacoas, the drainage area of which is free from animal pollution, as it is devoid of human habitations, with the exception of the forest ranger's hut. There are numerous streams of water, which mostly run throughout the year. Some of these reach a length of ten or twelve miles. On the leeward side of the island many of the smaller streams become dried up in the dry season of the year. Compared with the area of the island the extent of marshy and swampy land is small, and it occurs chiefly at the estuaries of the streams and on the flatter parts of the central plateau. At the coast there are a few small mangrove swamps.

The island was originally clothed to the water's edge with dense tropical forests, in which existed a large proportion of endemic trees and shrubs, with thick dark green coriaceous leaves. On account of the terrific hurricanes which periodically visit the island the trees were nowhere high, but they formed a dense mass of nearly uniform height, and were thus better fitted to withstand the violence of the wind. Beneath this dense canopy of evergreen foliage large numbers of shade and moisture loving plants, such as orchids, ferns, club-mosses, and other cryptogams, found a genial home. These shady forests not only prevented the rapid evaporation of water from the streams and ground by the heat of a tropical sun, but they also prevented the rapid flow of water towards the sea, and thus

kept up a more uniform water supply to the lower parts of the island. During the present century almost the whole of the virgin forests have been cleared away to make room for sugar-cane plantations, with disastrous results to the health and prosperity of the colony. The water-supply in the lower parts of the island, especially on the leeward or north-west side, has fallen short of the requirements, and in consequence many of the most profitable sugar estates have been abandoned. The once fertile land is now over-run with thorny shrubs and weeds, mostly natives of Asia and America. These foreign light and drought loving plants, however, are doing a good work in the economy of nature, by protecting the humus of the soil from the scorching rays of the sun until such time as reafforestation can be carried out. The Colonial Government of Mauritius has spent large sums of money within the last ten years in reafforestation of the land round the sources of the streams and along the river banks. This work has been ably carried out by Mr John Horne, late Director of Woods and Forests; but many years must elapse before much benefit can be expected from the good work commenced by him. Much more extensive planting, with selected species of native and foreign trees, is still required to ensure permanent amelioration of the health and prosperity of the colony. The transfer of the sugar-cane plantations from the lowlands to the highlands, together with the Indian coolies and animals employed on the sugar estates, has led to the pollution of the streams from which is obtained the drinking water of Port Louis and other places in the lowlands. All the washing of clothes is done in the streams; and on one occasion, when I was analysing the drinking water at the Victoria Battery, near Port Louis, after a case of enteric fever had occurred among the soldiers stationed there, I found, besides organic impurities, a blue-dyed fibre similar to those forming the blue coloured cloth usually worn by the natives. The water supply at the Victoria Battery was derived from the Grand River North West, in which the natives wash their clothes and bathe their bodies; and among people frequently suffering from enteric fever, dysentery, and diarrhœa, it is not to be wondered at that

these diseases should result from drinking the water derived from such a polluted stream as the Grand River North West.

In Baker's "Flora of Mauritius and the Seychelles," published in 1877, the number of native flowering plants and vascular cryptogams in Mauritius is given at 869 species, and the naturalised plants at 269 species. The result of my own botanical labours during the years 1887-90 has considerably extended the list of naturalised species, but I have only succeeded in adding a few new native species to the list of plants already recorded from Mauritius. Large numbers of American, Asiatic, and even European plants have become firmly established, and they are exterminating the native ones. In the neighbourhood of Port Louis, and near the coast on the north-west or leeward side of the island, where the climate is relatively much drier than on the windward side and more elevated parts, the wild plants are chiefly naturalised species of foreign introduction. Port Louis and the north-west seaboard of the island are hot-beds of malarial fever, which is very prevalent in the hot rainy season of the year. It is difficult to say whether the change of vegetation at these places has had anything or not to do with the production of malaria; but at Curepipe, Mare aux Vacoas, Grand Bassin, and other parts of the central plateau, about 2,000 feet above sea level, where the vegetation is almost entirely native, malarial fever is unknown, even where the ground is wet and marshy. The elevation of these places above sea level probably chiefly accounts for their immunity from malarial fever; but, at the same time, it must be borne in mind that the most malarial parts of Mauritius are those districts in which the climate is relatively drier, and in which the native shade and moisture loving plants have been most replaced by foreign light and drought loving ones. I think, therefore, that the reafforestation of the waste lands of Mauritius, with selected species of native trees, is likely to be followed by a distinct amelioration of the health and prosperity of the colony; and in time the timber grown in these lands would probably more than repay the original cost of planting.

Mauritius, being situated within two degrees of the Tropic of Capricorn, has a tropical climate; but owing to its isolated position in the Indian Ocean, and the cool south-east trade wind which blows during the greater part of the year, the climate is more temperate than that of other places in the same latitude. In general terms the climate may be described as hot, damp, and rainy, with a fair amount of bright sunshine, moderate winds, and occasional hurricanes of terrific violence. The higher parts of the island are much cooler, but very much damper and more rainy, than at the coast. The nature of the climate will be better understood from the following meteorological results, which have been taken from the annual reports of the Royal Alfred Observatory, under the able direction of the Honourable Charles Meldrum. The Observatory is 178.11 feet above sea level, and it is situated in the district of Pamplemousses, on the northern plain of the island, three miles from the west coast, and seven miles north-east of Port Louis. The Observatory is well equipped with modern meteorological instruments, and the annual reports contain elaborate results of all the meteorological elements forming climate.

ATMOSPHERIC PRESSURE REDUCED TO SEA LEVEL.

Mean for 1875-88	30.082 inches.
Highest in 1875-88 (20th June 1877) .	30.468 „
Lowest in 1875-88 (21st March 1879) .	29.632 „

In the great hurricane of 29th April 1892 the barometer fell to 27.95 inches.

WIND.

Mean velocity for 1876-88 . . 11.4 miles per hour.

Storms and gales very seldom occur, but the island is occasionally visited by most terrific hurricanes, which cause great loss of life and damage to crops and buildings. In the great hurricane of 29th April 1892 the wind reached a velocity of 121 miles per hour. The hurricane previous to this one occurred in 1879, between which year and 1888 the velocity of the wind exceeded 40 miles per hour on three occasions only.

TEMPERATURE OF AIR IN STEVENSON SCREEN ON LAWN.

Mean for 1885-88	74.8° Fah.
Highest in 1885-88 (11th February 1886) .	96.2° „
Lowest in 1885-88 (15th August 1887)	48.0° „

RAINFALL.

Annual mean fall for 1875-88 . .	47.02 inches.
Greatest fall in one year (1877) . .	71.86 „
Least fall in one year (1886) . .	29.74 „
Greatest fall in one day in 1875-88 (7th May 1884)	11.24 „
Average number of days of rainfall for 1875-88	200 days.

DEW POINT.

Mean for 1875-88	64.9° Fah.
Highest in 1875-88 (20th February 1876) .	79.9° „
Lowest in 1875-88 (5th September 1880) .	46.8° „

CLOUDS.

Upper Clouds—Mean for 1877-88 (10=overcast)	0.97
Lower Clouds—Mean for 1877-88 (10=overcast)	4.74

BRIGHT SUNSHINE.

Total duration of bright sunshine in 1888 .	2733.8 hours.
Period during which the sun was above the horizon in 1888	4410.5 „
Mean proportion for the year 1888 (constant sunshine=1) . . .	0.620

At the Nursery Gardens, Curepipe, 1,840 feet above sea level, within quarter of a mile of the military barracks at Curepipe Camp, in the interior of the island, the mean annual temperature in the shade for 1888 was 67.2° Fah., or 7.6° Fah. less than at the Royal Alfred Observatory, which is 178.11 feet above sea level. The rainiest station at Mauritius is at Cluny, which is 1,000 feet above sea level, on the windward side of the island, and a few miles south-east of Curepipe. At this station for the period 1862-88 (excluding 1875 and 1876) the rainfall was :—

Annual mean fall	144.24 inches.
Highest (1877)	203.50 „
Lowest (1886)	95.16 „
Average number of days of rainfall .	243 days.
Highest (1865 and 1868) . . .	292 „
Lowest (1878 and 1881) . . .	181 „

The estimated population of Mauritius at 31st December 1889 was 372,664, of whom 254,465, or fully two-thirds, belonged to the Indian population. In 1851 the Indian population was 77,996; in 1861, five years before the first outbreak of malarial fever in Mauritius, it had risen to 192,634; and in 1889 it was 254,465. This large increase in the Indian population, due to the immigration of coolies from India for the sugar estates, has done much to render the sanitary condition of the island bad within the last

forty years. The naturally dirty habits of the Indian coolies are, from a sanitary point of view, the great drawback to a class of people whose services are indispensable in the working of sugar estates in a tropical climate like that of Mauritius.

In the Army Medical Department Report for 1866, Appendix No. xlvi., pp. 442-477, there is a very good "Report on the Malarial Epidemic Fever of Mauritius of 1866-67," by Surgeon-Major John Small and Assistant-Surgeon W. H. T. Power, B.A., 2nd Battalion 13th Light Infantry. Previous to the year 1866 malarial fever does not appear to have existed in Mauritius, although relapses of malarial fever had occurred among the Indian immigrants, and also to a small extent among the troops; but in these cases the patients had contracted the disease in other countries. Many theories have been advanced as to the origin of the first outbreak of malarial fever in an island which had hitherto been free from malaria. Of these theories the principal are the large increase in the Indian population and the consequent fouling of the soil; extensive clearance of the virgin forests; upturning of the soil during the construction of the railway, the first portion of which was opened for traffic in May 1864; the spreading of river mud on the sugar-cane fields; diminished rainfall and concurrent high temperature; and, lastly, contagion. Most of the conditions embraced in these theories are undoubtedly favourable for the production of malaria; and the burial of a large number of dead bodies, containing the specific micro-organisms of malarial fever, during the rapid increase of the Indian population subsequent to 1851, in a soil peculiarly suitable for the production of malaria, may perhaps have been the original way in which malaria was introduced into Mauritius. At p. 466 of the Army Medical Department Report for 1866, the non-contagious character of malarial fever is explicitly stated by Drs Small and Power, and their statement agrees with my own experience of malarial fever at Mauritius and Sierra Leone. I was informed by Dr A. Davidson, Superintendent of the Government Lunatic Asylum at Beau Bassin, Mauritius, that the first outbreak of malarial fever among the civil

population occurred at Petite Rivière, which lies a few miles to the south-west of Port Louis. From this point the fever spread, in 1866 and 1867, north and south along the coast, invading the low lying parts of the district of Rivière Noire, Plaines Wilhems, Moka, Port Louis, Pamplemousses, Rivière du Rempart, and the northern part of Flacq. Drs Small and Powers' report is accompanied by a map of Mauritius, in which the malarial fever districts are coloured black. These districts lie for the greater part on the leeward side of the island, which is drier and hotter than the windward side. Subsequent to 1867, however, the malarial fever rapidly spread along the coast from Flacq to the districts of Grand Port and Savanne, and ever since this fever has been endemic along the coast and in the low lying parts of the island.

The following table, compiled from the Army Medical Department Reports for 1865-67 and 1889, shows the admission and death rates for malarial fever among the troops quartered in Mauritius during these years :—

Year.	Mean Yearly Strength of Troops.	Admissions with Malarial Fever.	Ratio per 1,000 of Strength.	Deaths.
1865	1,882	4	2.65	0
1866	1,781	37	20.07	0
1867	1,294	1,969	1,521.63	22
1889	524	367	700.38	0

The 4 admissions in 1865 were cases of relapses in men who had contracted the disease in other countries. In 1866 there were 37 admissions, and the most of these occurred towards the end of December. In 1867, the year of the great epidemic, out of a mean yearly strength of 1,294 soldiers there were 1969 admissions and 22 deaths. Of the 22 deaths from malarial fever 1 was due to the intermittent, and the remaining 21 to the remittent, variety of the disease. The death rate from malarial fever in 1867 was 17 per 1,000 of strength among the troops, whereas among the civil population it was 88 per 1,000 for the whole island. In Port Louis, where the disease was most prevalent and fatal, the death rate for the year amounted

to 274 per 1,000 of population. The low death rate among the troops, compared with that among the civil population, was due to the better conditions under which the sick were treated, and especially to the administration of large doses of quinine. In 1889 there were 367 admissions with malarial fever among the troops, but there were no deaths from this disease. Of the 367 admissions only 17 were treated in the Station Hospital at the Line Barracks in Port Louis, and the remaining 350 cases were treated in the Station Hospital at Curepipe Camp, 1,880 feet above sea level. The climate of Curepipe is free from malaria, and it has a very salutary effect on the patients sent up from Port Louis with malarial fever; but unfortunately the damp, rainy, and changeable climate of this place often causes relapses in men who have been discharged from hospital. Thus, of the total 367 admissions with malarial fever, 169 occurred among men stationed at Curepipe. These were mostly cases of relapses, but some of them were first attacks in men who had been exposed previously to malaria in Port Louis. Reference to this subject will be made again farther on in the present report. The remaining 198 admissions occurred among the troops stationed in Port Louis, and they were mostly cases of first attacks.

The following table, compiled from the Army Medical Department Reports for 1865-67 and 1889, shows the admission and death rates for all diseases among the troops quartered in Mauritius during these years:—

Year.	Ratio of Admissions per 1,000 of Strength.	Ratio of Deaths per 1,000 of Strength.
1865	752	7.97
1866	758	14.01
1867	2,233	40.95
1889	1,389.3	7.63

In 1889, out of a mean yearly strength of 524 soldiers, there were 728 admissions for all diseases in the Mauritius command. If the 367 admissions with malarial fever, due to the climate of Port Louis, be deducted from the total 728 admissions, the number of admissions for the other

diseases is 361, or a ratio of only 689 per 1,000 of strength, which is 63 less than the ratio of 752 in 1865 before the first outbreak of malarial fever occurred in Mauritius. The great unhealthiness of the troops quartered in Mauritius since 1866 has been due to malarial fever. For some years back Port Louis and Curepipe have been the only two stations occupied by the troops ; and as the latter station is healthy and free from malaria, the climate of Port Louis is alone responsible for the excessive amount of sickness which has prevailed in recent years among the troops quartered in the Mauritius command.

In 1889 the mean yearly strength of the troops stationed in Port Louis was 248, or a little less than half the strength of the command, which was 524 ; and the total number of admissions with malarial fever, due to the climate of this station, was 367. From my own experience of Port Louis from 1887-90, I have no hesitation in stating that if all the troops were stationed in Port Louis throughout the whole year, and the sick treated in hospital there, the sick rate would probably be as high as what it was in 1867. On the other hand, if all the troops were stationed at Curepipe throughout the whole year, the sick and death rates would most probably compare favourably with those of the troops in the United Kingdom. Thus for the year 1889, excluding the admissions with malarial fever due to the climate of Port Louis, the ratio of admissions for the other diseases per 1,000 of strength was 689 at Mauritius, and 730.4 for all diseases in the United Kingdom. For the same year the ratio of deaths per 1,000 of strength was 7.63 at Mauritius, and 4.57 in the United Kingdom ; but of the 4 deaths which occurred at Mauritius, 3 were in Port Louis, and the remaining 1 was a case of enteric fever which was contracted at Beau Bassin, when the man was a prisoner in the civil prison at that place.

Port Louis is situated on the north-west or leeward side of the island, on a fine harbour formed by a gap in the coral reef. The town is shut out from the full benefit of the south-east trade wind by an amphitheatre of rugged basaltic mountains, from 1,000 to 2,685 feet high. The site occupied by the town extends inland from the harbour for

about a mile, and the highest part of the town is about 80 feet above sea level. Several small streams flow from the mountain valleys through the town and discharge into the harbour. These streams receive the refuse and surface water of the town, which is conveyed into them by means of open drains along the street sides. The night soil is conveyed away in carts and used as manure on the sugar-cane plantations. The streets are laid out at right angles to one another, and the houses are built partly of stone and partly of wood. Many of the houses have small gardens attached, in which palms and other trees have been planted. Rows of trees were also planted at the sides of several of the streets, but most of these have been destroyed by the great hurricane of 29th April 1892. The part of the town bordering the harbour has been built on reclaimed land from the sea. Since 1866 a considerable extent of land has been reclaimed from the sea in the neighbourhood of Port Louis, and planted with Filaos (*Casuarina equisetifolia, Forst*); but there still exist marshy ground and brackish pools of water between Port Louis and the estuary of the Grand River North West. The estimated population of Port Louis, on 31st December 1889, was 61,170.

The barracks occupied by the troops stationed in Port Louis in 1889 were the Line Barracks, Fort Adelaide, and Fort George. The Line Barracks are situated near the west end of the town, about quarter of a mile from the harbour, and they are about 15 feet above sea level. The barrack enclosure is about 20 acres in extent, and the greater part of it is covered with grass. The soil is a stiff clay resting on rock. During the rainy season the subsoil water is within a few inches of the surface of the ground, and pools of water occur at some places. In the dry season the surface of the ground is much cracked from the heat and absence of moisture.

Fort Adelaide is situated on the top of a mountain spur, about 300 feet above sea level, near the centre of the town. The site is dry and airy, but the barrack accommodation is in casemates. Fort George is situated on Ile aux Tonneliers, at the north side of the entrance to the harbour. Between it and the main island a shallow sea, the Mer

Rouge, intervenes, in which the water is only a few feet deep. Across this shallow sea a built causeway, half-a-mile long, connects Fort George with the town of Port Louis. Ile aux Tonneliers is a small flat island, formed of coral *débris*, and the casemates in Fort George are only from 1½ to 4 feet above the high-water level of the sea. In 1889 Fort George was surrounded by a moat, in part of which the mud was uncovered by the sea at low water twice a day. The garrison of Port Louis during the year 1889 was composed of No. 8 Battery, Southern Division, Royal Artillery, which arrived from Singapore on 24th January 1888, and suffered so severely from malarial fever at Mauritius, that it was in consequence transferred to the Cape of Good Hope on 1st July 1889; No. 4 Battery of the same Division, which arrived at Mauritius in good health, from the Cape of Good Hope, on 1st August 1889; a detachment of the 1st Battalion North Staffordshire Regiment, which arrived in good health from Natal, on 14th December 1888; and small detachments of Royal Engineers, Departmental Corps, and Garrison Staff. The Garrison Staff, Departmental Corps, and a detachment of the 1st Battalion North Staffordshire Regiment, were quartered in the Line Barracks throughout the year; and in the months of July, August, and September three companies of the latter regiment from Curepipe were accommodated in these barracks. A small detachment of the 1st Battalion North Staffordshire Regiment was quartered at Fort Adelaide; and the Royal Artillery and the Royal Engineers were stationed at Fort George.

Malarial fever was prevalent among the troops of all the corps quartered in the Line Barracks, Fort Adelaide, and Fort George. The troops quartered in these three barracks were so frequently in the town of Port Louis, where malaria abounds, that no estimate of the relative unhealthiness of the different barracks can be formed from a comparison of the number of admissions with malarial fever at the different barracks. The mean yearly strength of warrant officers, non-commissioned officers, and men of the white troops in Port Louis, for the year 1889, was 248. The total number of admissions with malarial fever for the year

was 198, of which 17 were treated at the Station Hospital in Port Louis; and the remaining 181 were forwarded direct to Curepipe, 15 miles off, and treated in the Station Hospital at that place. Very few of the malarial fever patients discharged from hospital at Curepipe during the first four months of the year returned to Port Louis before the end of the hot unhealthy season in May, so that the admissions with malarial fever among the troops in Port Louis, during the first four months of the year, were almost entirely for first attacks. During the remainder of the year the proportion of relapses to first attacks was greater, but no record was kept of the exact number of each. Frequent interchanges took place among the troops stationed at Curepipe and Port Louis during the year; and in the months of July, August, and September nearly the whole Mauritius garrison was quartered in Port Louis, only a small detachment being left at Curepipe, so that during the year almost every soldier in the command resided for a longer or shorter period in Port Louis. It is unfortunate that no record was kept of the exact number of admissions for first attacks and relapses of malarial fever; because in dealing with the relation between malarial fever and the meteorological elements of temperature, rainfall, and relative humidity, it is important to eliminate or treat separately cases of relapses, which, from the experience of Drs Small and Power, as well as that of my own, are chiefly caused by chills due to sudden falls of temperature and to exposure to sun and great fatigue in hot weather. Exposure to damp weather, when the temperature is equable, has little effect in causing relapses, compared with sudden falls of temperature and consequent chills, even when the weather is dry. However, the great bulk of the 198 admissions with malarial fever at Port Louis in 1889 was for first attacks; and this was especially the case during the first quarter of the year, when 137, or fully two-thirds, of the whole 198 admissions for the year occurred.

As there was no meteorological station in the town of Port Louis, I have compiled the thirteen tables and chart which accompany this report from the results obtained at the Royal Alfred Observatory, which is situated seven

miles north-east of Port Louis. The climate of the two places is very similar, that of Port Louis being a little hotter and less rainy than that of the Observatory.

I shall now proceed to make some observations on the meteorological results recorded in the Summary 1889, and the Chart which accompanies it, and afterwards treat of the relation existing between these results and the admissions with malarial fever at Port Louis during the same year. The mean monthly temperature in the shade for 1889 was 74.0° Fah. January, February, March, April, November, and December were on an average 3.3° Fah. above the mean, with a mean monthly temperature of 77.3° Fah.; and the remaining six months, May to October, were on an average 3.4° Fah. below the mean, with a mean monthly temperature of 70.6° Fah. The hot season, therefore, lasts from November to April, and the cool season from May to October. For the four years 1885-88, the mean yearly temperature in the shade was 74.8° Fah., which is 0.8° Fah. above the mean temperature of 74.0° Fah. in 1889. The total rainfall in 1889 was 56.19 inches. The mean monthly rainfall was 4.68 inches. January, February, and March were on an average 7.10 inches above the mean, with a mean monthly rainfall of 11.78 inches; and the remaining nine months April to December were on an average 2.37 inches below the mean, with a mean monthly rainfall of 2.31 inches. The year 1889 was exceptional in having only three months above the mean, because for the fourteen years 1875-88, the six months January, February, March, April, May, and December were above the mean, and the remaining six months June to November were below the mean. The rainy season, therefore, lasts from December to May, and it begins and ends one month later than the hot season, which lasts from November to April. For the fourteen years 1875-88 on an average about three-fourths of the yearly rainfall occurred in the rainy season, and the remaining fourth in the comparatively dry season from June to November. For these fourteen years the mean yearly rainfall was 47.02 inches, which is 9.17 inches less than the 56.19 inches of rainfall in 1889.

The following table shows the rainfall, and number of days of rainfall, in each month in 1889. The total number of days of rainfall for the year was 208, which is 8 days above the mean of 200 days for the fourteen years 1875-88.

Months, 1889.	Rainfall. Inches.	Days of Rainfall in each Month.	Days of Rainfall in each Quarter.
January	12.74	18	
February	5.51	15	59
March	17.09	26	
April	4.65	23	
May	1.51	13	50
June	1.53	14	
July	2.21	17	
August	3.68	22	57
September	1.53	18	
October	1.20	21	
November	1.78	9	42
December	2.76	12	

The mean monthly relative humidity in 1889 was 76.5 per cent. of saturation. The five months January to May were on an average 3.9 per cent. above the mean, with a mean monthly relative humidity of 80.4 per cent.; and the remaining seven months June to December were on an average 2.8 per cent. below the mean, with a mean monthly relative humidity of 73.7 per cent. For the fourteen years 1875-88, the six months January, February, March, April, May, and December were above the mean; and the remaining six months June to November were below the mean. The damp season, therefore, lasts from December to May, and it exactly corresponds with the rainy season. The dry season lasts from June to November, and it exactly corresponds with the six months of least rainfall. For the fourteen years 1875-88, the mean yearly relative humidity was 73.7 per cent., which is 2.8 per cent. below the mean monthly relative humidity of 76.5 per cent. in 1889.

The year 1889 was, therefore, 0.8° Fah. cooler than the mean of the previous four years; the rainfall was 9.17 inches greater, the number of days of rainfall 8 more, and

the mean relative humidity 2.8 per cent. higher, than the corresponding means for the fourteen years 1875-88.

The mean monthly ratio of admissions with malarial fever per 1,000 of strength of the troops at Port Louis in 1889 was 92. January, February, and March were on an average 187 above the mean, with a mean monthly ratio of 279; and the remaining nine months April to December were on an average 62 below the mean, with a mean monthly ratio of 30. The first quarter of the year, viz., January to March, was not only the most unhealthy one from malarial fever, but it was also the hottest, rainiest, and dampest quarter of the year. Of the total 198 admissions with malarial fever at Port Louis during the year 1889, 137 were in the first quarter of the year, and only 61 in the remaining three quarters.

The malarial fever curves correspond with the temperature curves in eight months of the year, viz., January, March, April, June, July, August, September, and October. The four exceptions are—February, when there was a slight fall of 0.4° Fah. in the monthly mean temperature, but a considerable rise of 116 in the monthly ratio of admissions per 1,000 of strength, compared with the month of January; May, when there was was a fall of 4.3° Fah. in the monthly mean temperature, but a rise of 47 in the monthly ratio of admissions per 1,000 of strength, compared with the month of April; October, when there was a rise of 3.6° Fah. in the monthly mean temperature, but a very small fall of 3 in the ratio of admissions per 1,000 of strength, compared with the month of September; and December, when there was a rise of 3.1° Fah. in the monthly mean temperature, but a very small fall of 5 in the ratio of admissions per 1,000 of strength, compared with the month of November. The monthly mean temperature in January was 78.4° Fah.; in February, 78.0° Fah.; and in March, 78.9° Fah.,—so that much stress cannot be laid on the small fall of 0.4° Fah. in February, accompanied by a considerable rise of 116 in the monthly ratio of admissions per 1,000 of strength compared with the month of January, because the monthly mean temperature in these three months was very nearly the same. For the fourteen years 1875-88, the monthly mean tem-

perature was—in January, 78.6° Fah.; in February, 78.4° Fah.; and in March, 77.7° Fah.: so that in 1889 it will be observed that, while the monthly mean temperature was 0.2° Fah. in January and 0.4° in February below the mean of these months for the previous fourteen years, it was 1.2° Fah. in March above the mean of that month for the same period of fourteen years. March was the hottest month in 1889; whereas for the fourteen years 1875-88, on an average it was 0.9° Fah. cooler than January, and 0.7° Fah. cooler than February. The fall of 4.3° Fah. in the monthly mean temperature in May, accompanied by a rise of 45 in the ratio of admissions per 1,000 of strength, compared with the month of April, was partly due to cases of relapses in soldiers returned from Curepipe to Port Louis for duty at the end of the hot season in May. The fall of 4.3° Fah. in May below the monthly mean temperature in April, was the greatest difference in the monthly mean temperature in any two consecutive months of the year; so that possibly chills may have excited first attacks in soldiers who had been exposed to malaria during the previous hot season, but who had not actually suffered from malarial fever during that season. The other two months in which the temperature and malarial fever curves did not correspond were October and December; but even in these months, when there were so few admissions, the curves nearly agree, and one more admission in each of the two months would have made the two curves coincide. It will, therefore, be observed, that during the year 1889 there was a fairly close relation between the temperature and malarial fever curves, a rise of temperature being accompanied by an increase in the number of admissions with malarial fever. The most notable exceptions were in February and May, but, as already pointed out, the rise in the number of admissions in May, compared with April, was partly due to cases of relapses. Here, again, it is unfortunate that a record was not kept of the exact number of first attacks and relapses, instead of including the two classes in one return.

The malarial fever curves correspond with the rainfall curves in six months of the year, viz., January, March,

April, July, October, and November. On comparing the table at page 17 with the malarial fever curves, it will be observed that a still less relation exists between the monthly number of days of rainfall and the ratio of admissions with malarial fever per 1,000 of strength. The malarial fever curves only correspond with the curves of the monthly number of days of rainfall in four months of the year, viz., January, March, April, and July. The first quarter of the year, however, had a rainfall of 35.34 inches, or fully three-fifths of the total rainfall in 1889, which was 56.19 inches; and the number of days of rainfall in this quarter was 59, or from 2 to 17 days more than in any other quarter of the year.

The malarial fever curves correspond with the relative humidity curves in ten months of the year, viz., January and March to November, the two exceptions being February and December.

In 1889, therefore, the rise and fall of the malarial fever curves correspond with the relative humidity curves in ten months, with the temperature curves in eight months, with the rainfall curves in six months, and with the curves of the monthly number of days of rainfall in four months.

The malarial fever, temperature, and relative humidity curves all correspond in eight months of the year, viz., January, March, April, June, July, August, September, and October; whereas the malarial fever, temperature, and rainfall curves only all correspond in five months, viz., January, March, April, July, and November. The malarial fever, temperature, rainfall, and relative humidity curves, only all correspond in four months of the year, viz., January, March, April, and July.

It will, therefore, be observed, that in the year 1889 there was a much closer relation between the malarial fever curves and the temperature and relative humidity curves, than between the malarial fever curves and the rainfall curves. The relation between the malarial fever and relative humidity curves is very marked, the rise and fall of the two curves corresponding in ten months of the year. There may perhaps be some close relation between the relative humidity and the rise of malaria into the

atmosphere; for in Mauritius there is abundant proof of the accepted belief, that one is especially liable to suffer from malarial fever after exposure to the night air in malarial districts. The relative humidity of the air at night when the temperature is low, is much greater than during the day when the temperature is high. Thus, at the Royal Alfred Observatory, for the year 1888, the mean relative humidity was, at 6 a.m., 85.1 per cent.; whereas at 9 a.m. it was only 73.7 per cent., at 1 p.m. 66.3 per cent., and at 3 p.m. 67.3 per cent. At 9 a.m., therefore, the atmosphere was 11.4 per cent., and at 1 p.m. 18.8 per cent., drier than at 6 a.m.

Almost every one that resides in Port Louis at night for any length of time suffers from attacks of malarial fever; whereas those people who transact their business in the town during the day and reside at night in the elevated central plateau, from 1,000 to 2,000 feet above sea level, enjoy good health, and very seldom suffer from malarial fever. Gentlemen so situated have informed me that they never suffered from malarial fever, although they have transacted business almost daily for periods up to ten years and over. On the other hand, to sleep in Port Louis for a few nights in the hot unhealthy season is sufficient to cause an attack of malarial fever. Thus, on 19th January 1889, on account of native riots in Port Louis, 181 men of the 1st Battalion North Staffordshire Regiment were transferred from Curepipe to that place, and quartered in the Line Barracks. Of this number 134 returned to Curepipe on the 22nd of the same month, having only slept in Port Louis three nights. These men were free from malarial fever on their arrival from Natal on 14th December 1888, between which date and 19th January 1889 they had resided at Curepipe, which is free from malaria. Although the men were only exposed to malaria in Port Louis for three days, there were a considerable number of admissions for first attacks of malarial fever within a fortnight of their return to Curepipe. On referring to the monthly table for January 1889, it will be observed that during the three days that the men were in Port Louis the weather was very hot, and extremely rainy and damp. On the 19th, 20th, and 21st January, the mean

daily temperature in the shade was 76.1° Fah., 80.0° Fah., and 78.5° Fah. respectively; the daily rainfall was 2.55 inches, 0.94 inches, and 2.29 inches respectively; and the mean daily relative humidity was very high, being 94.0 per cent., 89.0 per cent., and 90.9 per cent. respectively. There was little wind blowing, and the atmosphere was oppressively close and muggy.

During the year 1889 the highest ratio of admissions with malarial fever per 1,000 of strength occurred in the month of March, in which month also occurred the highest monthly mean temperature, rainfall, and relative humidity; and the lowest ratio of admissions with the same fever occurred in August, in which month also occurred the lowest monthly mean temperature and relative humidity, but not the lowest monthly rainfall, which was in October. The rainfall in August was 3.68 inches, which was higher than the rainfall in any other month from May to December. The month of February is remarkable, for in it the ratio of admissions with malarial fever per 1,000 of strength rose from 134 in January to 250; whereas, compared with January, in February the monthly mean temperature in the shade fell 0.4° Fah., the monthly rainfall fell 7.23 inches, and the monthly mean relative humidity fell 3.6 per cent.

Although a fairly close relation has been shown to exist between the monthly ratio of admissions with malarial fever per 1,000 of strength and the corresponding monthly mean temperature and relative humidity, I am not in a position to state definitely what relation exists between the prevalence of malaria and these meteorological conditions, because the period of incubation in malarial fever is so uncertain, and probably varies considerably in duration in different individuals and at different seasons of the year. Thus, in the case of the men who were exposed to malaria for three days in Port Louis in January 1889, the period of incubation varied from a few days up to a fortnight and probably longer; whereas Drs Small and Power record two cases in which the period of incubation was at least five and six months respectively (*see* "Army Medical Report, 1866," pp. 466-7). External conditions, such as

exposure to chills, sun, and great fatigue in hot weather, have probably considerable influence in exciting attacks of malarial fever in persons' systems in which the malaria is latent. Thus, although the headquarters of the 2nd Battalion 13th Light Infantry, numbering 24 officers and 391 men, had been exposed to malaria in Port Louis from December 1866 to 1st April 1867, when it was transferred to non-malarial Flat Island, Drs Small and Power state that "most of the men and officers composing the headquarters of the regiment had had no fever till after their arrival in Flat Island, and then, from exposure to sun and great fatigue, numbers of them were struck down soon after with fever; indeed, far more were attacked with fever in a short time than had been the case in Port Louis itself, where the amount of duty and work was very slight." (*See* "Army Medical Department Report, 1866," pp. 455 and 466). I do not think that any very trustworthy information can be obtained from the monthly tables which accompany this report, by trying to trace any relation between the admissions with malarial fever and the meteorological elements for less periods than a month, for the following reasons:—

1st. The number of troops stationed in Port Louis was very small, especially in the hot malarial season.

2nd. The uncertainty of the duration of the period of incubation of malarial fever.

3rd. The troops at Port Louis and Curepipe were frequently interchanged between these two places.

4th. The men attacked with malarial fever did not always report themselves sick on the day on which the fever began.

5th. The admissions on the day following Sunday and public holidays included those men who had reported themselves sick and were "detained" on those days, when the patients could not be "admitted" and placed on regular "hospital diet," on account of the contractors' shops for hospital supplies being closed.

In 1889 the highest monthly number of admissions with malarial fever among the troops in Port Louis occurred in March, whereas in the epidemic of 1867 it was in April,

and in 1890 in May. In the hot season of 1890 the great bulk of the troops stationed in Port Louis had been exposed to malaria at that station during the previous year, so that the proportion of relapses to first attacks would have been much greater in 1890 than in 1889.

In 1890 the ratio of admissions with malarial fever per 1,000 of strength rose from 167 in April to 322 in May; whereas the monthly mean temperature fell from 75.3° Fah. in April to 70.9° Fah. in May, and the rainfall fell from 10.24 inches in April to only 0.2 inches in May. In 1889 malarial fever among the troops in Port Louis was most prevalent in March, which was the hottest, rainiest, and dampest month of the year; whereas in 1890 the fever was most prevalent in May, which was exceptionally cool and dry, the mean temperature in the shade being 1.0° Fah. below the mean, and the rainfall 3.97 inches below the mean for the fourteen years 1875-88. The number of days of rainfall in the month was only 7 in 1890.

Malaria probably exists at Port Louis during the whole year, but it is especially abundant in the hot, damp, rainy season. Ever since the first outbreak of malarial fever in 1866 this disease has been endemic in Mauritius, and every year it has caused a very large amount of sickness and invaliding among the troops quartered in the command. Since the first outbreak among the troops in 1866, the Army Medical Officers stationed in Mauritius have uniformly recommended the construction of new barracks on the elevated central plateau of the island, and the transfer thereto of the whole garrison, as the only effectual method of preventing the occurrence of malarial fever among the troops. New barracks to accommodate all the white troops have been quite recently constructed at Curepipe Camp, 1,880 feet above sea level. If all the troops are kept there throughout the whole year, and proper care taken of the sanitary arrangements of the barracks, it is most probable that in future years the health of the troops quartered in the Mauritius command will compare favourably with that of the troops in the United Kingdom. In time of war the whole garrison will be transferred to Port Louis for the purpose of manning the forts which defend the harbour

and coaling station ; and in time of peace the troops will probably be stationed there annually for a few months in the cool season for drill purposes. In the latter case, the months of July, August, and September would be the best time of the year, when the weather is cool and little malaria prevails.

I think that there is little doubt but that the high sick rate from malarial fever in Port Louis is due to the malaria produced in the soil of the town itself and its immediate neighbourhood, and not to malaria carried from any great distance by the wind. I am, therefore, of opinion that the health of the town could be much improved by constructing a complete system of water-sewerage and drainage for the town, combined with subsoil drainage of the town itself and the surrounding country within a mile of the outskirts of the town. In this area all marshy and swampy land should be reclaimed, pools of brackish water should be drained and filled up with earth, undergrowth of rank vegetation should be cleared away and permanently kept under, and selected species of trees planted in suitable localities. Subsoil drainage, by lowering the level of the underground water, and thereby diminishing the relative humidity of the atmosphere, is the improvement most likely to lead to the greatest reduction of malaria. Trees also, by absorbing moisture through their roots, would contribute to the drainage of the soil and the lowering of the level of the underground water.

On 12th March 1885 the Honourable Charles Meldrum, Director of the Royal Alfred Observatory, Mauritius, published a report on "The Mortality from Malarial Fever compared with the Rainfall, Temperature, and Relative Humidity, for the period 1871 to 1883, and for the year 1883," for the whole island of Mauritius, and also for the Pamplemousses district. For the thirteen years 1871-83, the highest monthly mean temperature was in January and the lowest in July ; the maximum monthly rainfall was in March and the minimum in October ; the highest monthly mean relative humidity was in April and the lowest in October ; and the maximum monthly mortality from malarial fever was in May and the minimum in November.

It will, therefore, be observed, that for the period 1871-83 the maximum mortality from malarial fever was in May, or four months after the maximum temperature, two months after the maximum rainfall, and one month after the maximum relative humidity. For the same period the minimum mortality was in November, or four months after the minimum temperature, and one month after the minimum rainfall and relative humidity.

With reference to the chart which accompanies Dr Meldrum's report, he states that "the temperature curves differ so little, and those of mortality from fever differ so much, that the great variations in the amount of the mortality can hardly be supposed to be due to variations of temperature," and "the humidity curves have, as might be expected, a strong resemblance to the rainfall curves; but the latter have a greater rememblance to the mortality curves than the former have."

Dr Meldrum's report refers only to mortality statistics derived from tables prepared by the General Board of Health and the Registrar-General of Mauritius, whereas my present report refers only to the statistics of admissions for attacks of malarial fever. All the military patients admitted into hospital with malarial fever at Port Louis in 1889, were seen and treated by medical officers well acquainted with malarial and enteric fever, so that there is no doubt about the accuracy of their diagnosis. Of the total 367 admissions with malarial fever in the Mauritius command in 1889 there was not a single death; so that among the troops for the year 1889, there are no mortality statistics to compare with those given in Dr Meldrum's report, which refers to the civil population of Mauritius. Among the troops in the epidemic of 1867 the maximum number of admissions with malarial fever occurred in April; but the maximum mortality from this disease was in the following month of May, when 11 of the 22 deaths occurred.

For the period 1871-83 the mean annual population of Mauritius was about 335,000, among whom during this period the maximum mean monthly number of deaths from malarial fever was 625.4 in May, and the minimum 317.1 in November. Among the civil population residing

in the malarial districts, one can understand why the maximum death rate from malarial fever should occur towards the end of the hot malarial season, when the sufferers' vitality has been lowered by extreme heat and frequent successive attacks of malarial fever; but it appears strange that there should have been such a high mortality from malarial fever among the civil population in the cool season of the year, when, judging from military statistics, this season is comparatively healthy and free from malaria. Among the troops stationed at Port Louis in 1889, the ratio of admissions with malarial fever per 1,000 of strength for the first half of the year was 905, but in the second half of the year it was only 111. In the epidemic of 1867 four-fifths of the admissions, and all the deaths, from malarial fever occurred in the first half of the year, and only one-fifth of the admissions and no deaths in the second half. On the other hand, for the period 1871-83 the mean half-yearly mortality from malarial fever among the civil population was 3023.3 in the first half of the year, and 2210.0 in the second half. Only about three-fifths, therefore, of the deaths occurred in the first half of the year, and two-fifths in the second half.

The annual Army Medical Department reports record admissions for, and deaths from, enteric fever among the troops quartered in Mauritius before and after the first outbreak of malarial fever in 1866. Cases recorded in these reports as typho-malarial fever, were simply cases of enteric fever and malarial fever co-existing in the same patient. The Army Medical officers serving in Mauritius have had no doubt about the occurrence of enteric fever among the troops; but up to the time I left Mauritius in 1890, few of the civil practitioners, numbering between sixty and seventy qualified gentlemen, appear to have fully recognised the disease among the civil population. Taking into consideration the long existence of enteric fever among the troops, and the highly insanitary condition of the towns and villages in Mauritius, together with the pollution of the drinking water, I have no doubt but that a considerable number of the deaths attributed to malarial fever in the Registrar-General's returns were really due to enteric fever.

This is also the opinion of Surgeon-Colonel C. A. Maunsell and the other medical officers who have served with me at Mauritius. In an island like Mauritius where malarial fever is so very prevalent, where many of the natives are attended by quacks, and where enteric fever, which undoubtedly exists among the civil population, is not fully recognised by the majority of the civil practitioners, it is probable that malarial fever in Mauritius has a much higher death rate attributed to it than it is really entitled to. For these reasons I think that the conclusions arrived at in Dr Meldrum's report should be taken with some qualification; and in future years, when enteric fever is more fully recognised and accurately diagnosed in Mauritius, more reliable statistics will be obtained of the mortality from malarial fever, and a better comparison made of the relation existing between this mortality and the meteorological elements of climate at the different seasons of the year.

To arrive at an accurate knowledge of the relation which may exist between the prevalence of malarial fever and the meteorological elements of climate in a malarial district, it would be necessary to keep a daily record, extending over a number of years, of the following particulars:—

1st. Strength of the troops under observation.

2nd. Number of attacks from malarial fever, distinguishing first attacks from subsequent attacks and relapses, under the two varieties of remittent fever and intermittent fever.

3rd. Mean, maximum, and minimum temperature in the shade, and maximum temperature in the sun's rays, with special reference to any exposure of the troops to the sun or to great fatigue in hot weather.

4th. Atmospheric pressure, with special reference to diurnal variation. Thus, at the Royal Alfred Observatory, Mauritius, from hourly observations throughout the thirteen years 1875-87, it was found that the mean variation of the atmospheric pressure from the daily mean was from 0.001 to 0.017 inch below the daily mean between the hours of 1 a.m. and 6 a.m. This lowering of the atmospheric pressure would favour the rise of the humid malaria-bearing ground air into the lower strata of the atmosphere at night time. From the same observations, it was found that

between the hours of noon and 6 p.m. the mean variation of the atmospheric pressure from the daily mean was from 0.003 to 0.039 inch below the daily mean ; but, as is pointed out at page 24 of this report, the relative humidity of the atmosphere in the afternoon in Mauritius is about 18 per cent. lower than what it is at 6 a.m. (*See* "Islands of the Southern Indian Ocean," p. 297, by Captain H. A. Moriarty, R.N., C.B.)

5th. Direction and velocity of the wind.

6th. Rainfall, and number of days of rainfall.

7th. Relative humidity of the atmosphere at 6 a.m. and 1 p.m., and the mean relative humidity.

8th. Level of subsoil water below surface of the ground.

At Mauritius full and accurate meteorological results are published in the annual reports of the Royal Alfred Observatory, and the level of the subsoil water could be ascertained daily by means of a well sunk in the ground in a suitable locality. In the case of first attacks of malarial fever, a record should be kept of the time which has elapsed between the date of the man's arrival in the malarial district and the date of his attack.

Accurate observations, of the nature above indicated, and extending over a number of years, would probably afford sufficient data to enable one to trace some definite relation between the greater prevalence of malarial fever at different seasons of the year, and in different months in different years, and the varying meteorological elements of climate in different years and at different seasons of the same year, at the same station. Malarial fever was most prevalent among the troops in Port Louis in March 1889, April 1867, and May 1890 ; and it would be interesting to know how far the maximum monthly sick rate in these different months, in different years, depended on the meteorological elements of climate.

Accurate statistics of first attacks of malarial fever in men who have not been exposed to malaria previous to their arrival in the malarial district, and a knowledge of the period of incubation, are essential before one can be in a position to trace any definite relation which may exist between the production of malaria and the meteorological

elements of climate at any particular season of the year. If the usual period of incubation could be ascertained at any particular station, then the prevalence of malarial fever at any particular date must be referred to the amount of malaria existing at a previous date, which would depend on the duration of the period of incubation. Concurrently with the foregoing observations, it would be very desirable to carry out laboratory experiments with reference to the growth and development of the pathogenic micro-organism of malarial fever.

HENRY HALCRO JOHNSTON.

LEITH FORT,
SCOTLAND, 1*st August* 1894.

MONTHLY TABLES, showing the Daily Strength of the Troops, Admissions with Malarial Fever, Ratio of Admissions per 1,000 of Strength, Mean Temperature, Rainfall, and Mean Relative Humidity, at Port Louis, Mauritius, for the year 1889.

JANUARY 1889.

Date.	Daily Strength of Troops.	Admissions with Malarial Fever.	Ratio per 1,000 of Strength.	Mean Daily Temperature in the Shade, Fah. deg.	Daily Rainfall, Inches.	Mean Daily Relative Humidity, Saturation =100.	Remarks.
1	199	...	...	78.8	...	84.0	Public Holiday.
2	197	...	...	80.0	...	74.3	Public Holiday.
3	197	1	5.08	80.1	...	77.8	
4	197	2	10.16	78.3	0.09	77.6	
5	197	...	...	78.4	...	73.7	
6	194	...	...	78.9	...	71.2	Sunday.
7	196	...	...	73.4	...	88.0	
8	199	3	15.08	77.2	0.29	70.1	
9	195	2	10.26	72.3	...	77.3	
10	195	...	...	73.5	...	76.7	
11	196	1	5.10	76.5	...	71.8	
12	201	1	4.98	79.9	...	75.9	
13	200	...	...	82.9	0.01	80.7	Sunday.
14	200	2	10.00	82.6	0.09	82.6	
15	198	6	30.30	76.7	0.56	85.5	
16	197	...	...	76.2	...	88.7	
17	196	1	5.10	76.4	0.72	90.5	
18	196	...	...	77.1	0.31	90.5	[from Curepipe.
19	391	3	7.67	76.1	2.55	94.0	181 men arrived
20	391	...	...	80.0	0.94	89.0	Sunday.
21	391	2	5.12	78.5	2.29	90.9	[to Curepipe.
22	257	...	...	80.6	0.08	80.5	134 men departed
23	239	...	...	79.6	...	84.8	
24	239	...	...	76.3	0.26	90.5	
25	239	...	...	75.4	1.17	93.2	
26	223	...	...	78.9	2.77	88.3	
27	224	...	...	81.9	0.18	81.0	Sunday.
28	224	...	...	81.6	0.03	78.4	
29	221	2	9.05	80.6	0.12	80.8	[to Curepipe.
30	172	2	11.63	80.9	0.28	81.5	51 men departed
31	171	2	11.70	80.7	...	74.9	
	224	30	133.93	78.4	12.74	82.1	

FEBRUARY 1889.

Date.	Daily Strength of Troops.	Admissions with Malarial Fever.	Ratio per 1,000 of Strength.	Mean Daily Temperature in the Shade, Fah. deg.	Daily Rainfall, Inches.	Mean Daily Relative Humidity, Saturation =100.	Remarks.
1	170	1	5.88	79.4	0.01	79.1	
2	187	...	...	80.8	0.02	79.4	
3	187	...	...	78.2	0.20	77.6	Sunday.
4	187	5	26.74	78.7	...	80.5	
5	184	2	10.87	80.0	0.22	77.9	
6	183	...	...	78.9	...	74.9	
7	178	5	28.09	79.3	...	73.2	
8	178	4	22.47	79.1	...	75.8	
9	192	...	...	80.5	0.01	74.3	
10	192	...	...	80.0	...	75.9	Sunday.
11	186	6	32.26	76.1	...	73.4	
12	184	2	10.87	77.3	0.06	77.3	
13	179	1	5.59	72.8	...	81.5	
14	176	3	17.05	76.1	0.09	78.5	
15	177	2	11.30	76.4	...	72.0	
16	169	2	11.83	77.4	...	75.9	
17	166	...	...	74.2	...	78.6	Sunday.
18	150	3	20.00	79.7	...	76.7	
19	149	...	...	76.1	...	87.5	
20	162	...	...	79.9	0.08	73.6	
21	160	...	...	79.4	0.08	80.8	
22	160	...	...	79.1	0.16	77.0	
23	161	2	12.42	79.2	...	62.5	
24	160	...	...	76.4	0.03	81.0	Sunday.
25	161	4	24.84	78.7	0.03	84.3	
26	158	...	...	75.1	1.00	93.3	
27	158	...	...	78.0	1.67	89.0	
28	166	1	6.02	78.2	1.85	90.7	
	172	43	250.00	78.0	5.51	78.5	

MARCH 1889.

Date.	Daily Strength of Troops.	Admissions with Malarial Fever.	Ratio per 1,000 of Strength.	Mean Daily Temperature in the Shade, Fah. deg.	Daily Rainfall, Inches.	Mean Daily Relative Humidity, Saturation =100.	Remarks.
1	166	1	6.02	78.6	0.57	88.5	
2	164	...	...	75.3	1.19	92.8	
3	163	...	...	76.5	1.85	92.2	Sunday.
4	162	...	...	80.2	0.37	89.2	
5	159	...	...	79.5	0.06	89.9	
6	158	4	25.15	79.0	...	61.3	
7	167	...	...	76.1	...	75.7	
8	167	1	5.99	76.8	...	81.9	
9	143	6	41.96	75.0	1.52	88.7	
10	143	...	...	76.8	1.45	87.0	Sunday.
11	142	3	21.13	75.8	0.92	95.4	
12	141	...	...	79.4	3.23	86.7	
13	140	5	35.71	82.3	0.01	83.3	
14	142	2	14.08	81.2	1.47	82.5	
15	142	2	14.08	79.6	0.15	83.8	
16	122	3	24.59	82.1	0.02	87.4	
17	122	...	...	79.4	0.30	87.9	Sunday.
18	125	10	80.00	77.2	1.03	86.0	
19	126	4	31.74	81.1	0.02	86.0	
20	127	6	47.24	79.9	0.37	85.2	
21	123	1	8.13	79.2	0.14	81.3	
22	124	2	16.12	79.5	0.54	81.7	
23	126	1	7.93	78.5	...	75.2	
24	126	...	...	79.8	0.34	85.7	Sunday.
25	124	6	48.38	79.3	0.27	77.8	
26	125	1	8.00	78.3	0.02	84.6	
27	127	2	15.75	82.8	0 .03	84.1	
28	128	1	7.81	81.2	0.01	84.3	
29	128	3	23.43	79.8	0.80	83.6	
30	157	...	...	79.7	...	80.3	
31	156	...	...	76.6	0.41	84.5	Sunday.
	141	64	453.90	78.9	17.09	84.3	

APRIL 1889.

Date.	Daily Strength of Troops.	Admissions with Malarial Fever.	Ratio per 1,000 of Strength.	Mean Daily Temperature in the Shade, Fah. deg.	Daily Rainfall, Inches.	Mean Daily Relative Humidity, Saturation =100.	Remarks.
1	135	...	...	78.9	0.12	84.9	
2	134	1	7.46	79.3	0.05	74.0	
3	134	...	...	79.4	...	76.8	
4	134	...	...	77.7	...	84.9	
5	134	1	7.46	79.5	0.78	81.6	
6	134	...	..	76.5	0.01	75.5	
7	135	...	...	77.2	...	80.8	Sunday.
8	135	1	7.41	77.0	0.01	88.2	
9	133	...	...	78.0	0.73	73.6	
10	132	...	...	77.1	...	72.3	
11	133	...	...	77.4	0.05	85.0	
12	133	...	...	76.9	0.10	74.6	
13	141	1	7.09	77.0	...	66.2	
14	141	...	...	75.3	0.04	67.2	Sunday.
15	140	1	7.14	76.2	0.06	73.5	
16	140	1	7.14	75.1	0.18	78.9	
17	140	...	...	76.4	0.12	76.8	
18	140	...	...	77.3	0.01	70.7	
19	140	...	...	77.0	...	63.0	Public Holiday.
20	147	...	...	76.2	0.04	77.7	
21	146	...	...	71.5	0.02	84.2	Sunday.
22	145	...	...	77.5	0.14	80.1	Public Holiday.
23	146	...	...	75.6	0.26	83.6	
24	147	...	...	76.9	0.04	79.3	
25	144	...	...	74.2	0.37	83.6	
26	146	...	...	75.5	0.02	79.3	
27	165	...	...	77.3	0.03	78.1	
28	167	...	...	77.3	...	81.4	Sunday.
29	167	...	...	76.5	0.69	82.0	
30	166	...	...	76.5	0.78	79.9	
	142	6	42.25	76.8	4.65	78.0	

MAY 1889.

Date.	Daily Strength of Troops.	Admissions with Malarial Fever.	Ratio per 1,000 of Strength.	Mean Daily Temperature in the Shade, Fah. deg.	Daily Rainfall, Inches.	Mean Daily Relative Humidity, Saturation =100.	Remarks.
1	166	...	...	76.8	0.02	80.1	
2	167	1	5.99	76.7	...	80.8	
3	165	...	...	76.8	0.07	83.0	
4	187	...	...	75.6	0.08	79.4	
5	190	...	...	76.2	...	79.3	Sunday.
6	189	...	...	73.2	...	71.4	
7	189	...	...	73.2	0.12	78.9	
8	189	...	...	73.6	0.02	78.1	
9	189	...	...	70.3	0.03	69.4	
10	189	...	...	73.3	..	78.4	
11	197	3	15.23	72.1	...	83.5	
12	198	...	...	77.0	0.07	80.4	Sunday.
13	194	1	5.15	71.6	...	81.1	
14	194	1	5.15	73.0	...	83.8	
15	195	...	...	75.0	0.09	83.7	
16	195	1	5.13	75.6	0.15	78.2	
17	195	2	10.26	75.5	0.08	77.9	
18	191	...	...	72.4	...	83.0	
19	192	...	...	71.8	...	79.9	Sunday.
20	193	...	...	71.1	0.01	77.3	
21	192	...	...	70.2	...	82.3	
22	191	3	15.70	71.1	...	83.2	
23	191	...	...	72.6	...	72.9	
24	191	...	...	70.0	...	73.4	Public Holiday.
25	196	..	...	67.2	...	80.3	
26	196	...	...	68.6	...	75.2	Sunday.
27	196	...	...	68.8	...	82.1	Public Holiday.
28	194	1	5.15	69.6	...	75.7	
29	194	...	...	64.3	...	85.8	
30	195	2	10.26	70.2	0.76	76.8	
31	194	2	10.31	72.9	0.01	76.2	
	190	17	89.47	72.5	1.51	79.1	

JUNE 1889.

Date.	Daily Strength of Troops.	Admissions with Malarial Fever.	Ratio per 1,000 of Strength.	Mean Daily Temperature in the Shade, Fah. deg.	Daily Rainfall, Inches.	Mean Daily Relative Humidity, Saturation =100.	Remarks.
1	207	...	...	70.2	0.04	84.4	
2	207	...	...	72.4	0.39	87.4	Sunday.
3	207	...	...	75.5	0.07	79.0	
4	207	...	...	73.8	0.13	79.2	
5	207	...	...	73.0	0.05	83.9	
6	207	...	...	71.5	0.05	73.4	
7	207	...	...	66.9	...	73.7	
8	201	...	...	69.3	...	73.0	
9	201	...	...	68.1	...	68.6	Sunday.
10	201	2	9.95	68.1	...	68.5	
11	202	...	...	68.4	...	70.5	
12	202	...	...	69.0	...	70.8	
13	203	...	..	70.5	...	74.8	
14	204	...	...	70.4	...	60.4	
15	210	...	...	69.4	...	71.0	
16	210	...	...	72.4	...	79.3	Sunday.
17	212	...	...	72.4	...	70.8	
18	212	...	...	66.1	...	71.3	
19	211	...	...	69.0	...	69.4	
20	211	...	...	67.6	...	78.8	
21	211	...	...	71.5	...	77.8	
22	234	...	...	70.7	0.09	77.5	
23	234	...	...	71.1	0.03	77.2	Sunday.
24	234	...	...	68.3	0.05	83.3	
25	235	...	...	73.1	0.25	77.9	
26	234	...	...	69.9	0.05	78.0	
27	234	1	4.27	69.5	0.28	74.9	
28	234	...	...	64.2	...	74.8	Public Holiday.
29	234	...	...	67.7	0.03	66.4	
30	234	...	...	66.7	0.02	70.6	Sunday.
	215	3	13.95	69.9	1.53	74.9	

JULY 1889.

Date.	Daily Strength of Troops.	Admissions with Malarial Fever.	Ratio per 1,000 of Strength.	Mean Daily Temperature in the Shade, Fah. deg.	Daily Rainfall, Inches.	Mean Daily Relative Humidity, Saturation =100.	Remarks.
1	155	...	...	68.4	0.03	60.7	79 men departed
2	154	...	...	66.7	0.09	73.1	to South Africa.
3	427	2	5.68	68.5	0.01	67.7	273 men arrived
4	427	2	5.68	66.1	0.01	71.9	from Curepipe.
5	427	...	...	69.5	...	56.6	
6	407	...	...	67.1	...	66.6	
7	407	...	...	68.8	0.03	74.8	Sunday.
8	407	...	...	70.2	...	83.4	
9	407	...	...	70.5	0.06	91.3	
10	403	...	...	70.6	0.34	84.8	
11	403	...	...	72.6	...	70.1	
12	403	...	...	68.0	...	69.0	
13	403	...	...	69.6	...	66.4	
14	403	...	..	69.9	0.14	83.4	Sunday.
15	400	2	5.00	70.9	0.06	78.1	
16	400	...	...	69.5	0.04	67.8	
17	398	...	...	72.7	0.15	83.5	
18	398	...	...	73.1	0.10	79.5	
19	398	2	5.03	72.2	0.04	81.9	
20	391	...	...	71.9	...	79.2	
21	391	...	...	70.4	...	75.0	Sunday.
22	387	2	5.17	71.4	...	79.6	
23	397	1	2.52	66.9	...	84.1	
24	397	...	...	72.0	0.40	74.9	
25	397	...	...	71.6	0.10	75.5	
26	397	...	...	69.6	...	76.0	
27	388	1	2.57	71.5	0.35	84.6	
28	388	...	...	71.2	0.26	76.3	Sunday.
29	390	...	...	68.3	...	78.8	
30	397	...	...	70.5	...	67.6	
31	397	...	...	70.8	...	67.0	
	385	12	31.30	70.0	2.21	75.8	

AUGUST 1889.

Date.	Daily Strength of Troops.	Admissions with Malarial Fever.	Ratio per 1,000 of Strength.	Mean Daily Temperature in the Shade, Fah. deg.	Daily Rainfall, Inches.	Mean Daily Relative Humidity, Saturation =100.	Remarks.
1	494	...	...	69.9	1.06	80.8	97 men arrived
2	491	...	...	72.0	0.15	71.3	from S. Africa.
3	495	1	2.02	69.5	...	74.0	
4	495	...	...	69.3	0.03	80.0	Sunday.
5	493	2	4.07	71.0	0.61	75.1	
6	490	...	...	71.0	0.03	70.3	
7	490	...	...	70.8	0.55	66.6	
8	489	...	...	70.3	0.06	72.5	
9	470	...	...	68.1	0.02	67.6	19 men departed
10	465	...	...	69.8	...	74.6	to South Africa.
11	465	...	...	69.8	...	68.4	Sunday.
12	467	...	...	66.3	...	63.6	
13	469	...	...	69.2	...	60.6	
14	463	...	...	68.1	...	55.0	
15	463	...	...	69.3	...	57.2	Public Holiday.
16	463	...	...	65.3	0.03	72.3	
17	491	...	...	67.0	0.06	75.3	
18	491	...	...	68.8	0.06	77.5	Sunday.
19	490	1	2.04	68.4	0.07	80.9	
20	490	...	...	68.6	...	69.0	
21	491	...	...	68.8	0.39	73.6	
22	488	...	...	68.1	...	62.5	
23	488	...	...	69.1	0.07	69.8	
24	456	...	...	68.2	0.03	72.9	
25	456	...	...	69.5	0.01	65.6	Sunday.
26	456	...	...	69.3	0.04	77.4	Public Holiday.
27	461	...	...	69.0	0.30	79.8	
28	461	...	...	69.6	0.05	71.2	
29	461	...	...	70.1	0.04	74.8	
30	461	...	...	71.8	0.01	75.0	
31	463	...	...	69.3	0.01	74.8	
	476	4	8.40	69.2	3.68	71.4	

SEPTEMBER 1889.

Date.	Daily Strength of Troops.	Admissions with Malarial Fever.	Ratio per 1,000 of Strength.	Mean Daily Temperature in the Shade, Fah. deg.	Daily Rainfall, Inches.	Mean Daily Relative Humidity, Saturation =100.	Remarks.
1	463	...	...	69.2	0.10	73.7	Sunday.
2	466	...	...	67.5	0.02	72.8	
3	466	...	...	69.5	0.01	70.3	
4	464	...	...	70.0	0.06	73.1	
5	461	...	...	71.7	0.04	73.1	
6	461	...	...	68.6	0.07	85.1	
7	457	1	2.19	69.6	0.09	70.8	
8	457	...	...	71.2	...	74.6	Sunday.
9	457	...	...	73.3	0.11	72.8	
10	457	...	...	72.5	0.08	69.7	
11	457	...	...	67.5	...	73.6	
12	457	...	...	65.7	...	82.6	
13	457	1	2.19	70.9	...	71.4	
14	451	...	...	72.9	...	69.3	
15	451	...	...	70.8	0.02	71.5	Sunday.
16	451	...	...	69.7	...	68.1	
17	451	...	...	70.9	0.06	72.5	
18	457	1	2.19	67.8	0.14	71.3	
19	452	...	...	68.7	0.11	66.7	
20	452	...	...	67.1	0.08	67.9	
21	450	...	...	69.0	...	65.9	
22	450	...	...	70.1	...	73.7	Sunday.
23	447	1	2.44	69.7	0.03	71.2	
24	427	...	...	69.2	0.12	78.9	
25	426	...	...	72.5	0.04	74.7	
26	425	...	...	68.7	...	77.3	Public Holiday.
27	425	...	...	63.4	...	85.7	
28	433	1	2.31	69.2	0.35	77.0	
29	431	...	...	72.8	...	77.2	Sunday.
30	431	1	2.32	69.9	...	75.2	
	450	6	13.33	69.7	1.53	74.1	

OCTOBER 1889.

Date.	Daily Strength of Troops.	Admissions with Malarial Fever.	Ratio per 1,000 of Strength.	Mean Daily Temperature in the Shade, Fah. deg.	Daily Rainfall, Inches.	Mean Daily Relative Humidity, Saturation =100.	Remarks.
1	431	...	...	67.3	...	85.5	
2	431	1	2.32	73.2	0.01	77.4	
3	191	...	...	73.5	0.01	74.7	350 men departed
4	192	...	...	73.8	...	69.3	to Curepipe.
5	193	...	...	72.7	...	71.0	
6	193	...	...	72.5	0.03	69.9	Sunday.
7	193	..	...	72.3	0.01	67.7	
8	194	...	...	73.8	...	70.8	
9	194	...	...	73.4	...	72.1	
10	194	...	...	73.3	0.12	70.4	
11	194	...	...	74.7	0.03	68.1	
12	192	...	...	73.1	0.09	70.9	
13	192	...	...	73.6	0.13	67.9	Sunday.
14	192	...	...	72.3	...	73.1	
15	192	...	...	72.0	0.01	76.4	
16	192	1	5.21	71.3	...	80.0	
17	192	...	...	74.0	0.04	71.1	
18	192	...	..	73.5	0.12	73.5	
19	191	...	...	71.6	0.01	69.9	
20	190	...	...	71.9	0.01	73.3	Sunday.
21	190	...	...	74.0	0.02	74.4	
22	189	...	...	75.2	..	70.3	
23	191	...	...	76.0	0.02	71.6	
24	191	...	...	74.5	0.14	74.9	
25	191	...	...	75.0	...	68.3	
26	193	...	...	72.5	0.10	74.9	
27	193	...	...	73.2	0.01	74.6	Sunday.
28	193	...	...	73.9	...	69.6	
29	193	...	...	73.3	0.04	67.9	
30	193	...	...	74.3	0.05	70.2	
31	193	...	...	75.5	0.20	66.2	
	208	2	9.61	73.3	1.20	72.2	

NOVEMBER 1889.

Date.	Daily Strength of Troops.	Admissions with Malarial Fever.	Ratio per 1,000 of Strength.	Mean Daily Temperature in the Shade, Fah. deg.	Daily Rainfall, Inches.	Mean Daily Relative Humidity, Saturation =100.	Remarks.
1	193	...	...	72.0	...	75.3	Public Holiday.
2	196	...	...	76.8	0.07	70.8	Public Holiday.
3	195	...	...	74.9	...	67.2	Sunday.
4	192	...	...	72.2	...	70.6	
5	191	...	...	73.3	...	71.7	
6	191	...	...	71.9	...	77.1	
7	190	...	...	68.6	...	80.1	
8	190	...	...	71.8	...	75.4	
9	188	...	...	74.1	...	65.7	Public Holiday.
10	188	...	...	77.5	...	68.8	Sunday.
11	188	...	...	77.3	...	67.8	
12	188	...	...	77.7	...	67.5	
13	188	...	...	75.1	...	68.4	
14	188	...	...	78.4	...	62.6	
15	188	...	...	73.5	...	70.6	
16	185	2	10.81	69.8	0.16	81.4	
17	185	...	...	71.9	0.31	82.1	Sunday.
18	185	...	...	71.7	0.07	79.1	
19	185	...	...	72.0	...	75.0	
20	185	...	...	75.5	...	67.5	
21	185	1	5.41	75.1	...	61.9	
22	185	...	...	74.2	...	66.3	
23	181	1	5.53	74.0	0.01	78.5	
24	181	...	...	78.1	0.20	71.1	Sunday.
25	181	...	...	77.0	...	74.1	
26	180	1	5.55	72.7	0.28	87.9	
27	180	...	...	75.3	0.60	75.1	
28	180	1	5.56	78.0	...	71.9	
29	181	...	...	74.8	...	78.4	
30	158	...	...	73.6	0.08	73.2	
	186	6	32.26	74.3	1.78	72.9	

DECEMBER 1889.

Date.	Daily Strength of Troops.	Admissions with Malarial Fever.	Ratio per 1,000 of Strength.	Mean Daily Temperature in the Shade, Fah. deg.	Daily Rainfall, Inches.	Mean Daily Relative Humidity, Saturation =100.	Remarks.
1	158	...	...	78.0	0.02	68.7	Sunday.
2	166	...	...	76.6	0.06	71.0	
3	166	...	...	78.0	...	72.0	
4	166	...	...	80.0	...	71.1	
5	177	...	...	74.1	...	70.5	
6	177	...	...	77.9	...	69.2	
7	176	...	...	74.9	...	70.5	
8	176	...	...	77.3	...	68.2	Sunday.
9	176	...	...	77.8	...	65.6	
10	176	...	...	77.3	...	74.0	
11	179	...	...	79.7	...	73.7	
12	178	1	5.62	80.0	0.02	74.5	
13	178	...	..	78.6	0.14	78.9	
14	188	...	...	74.7	0.03	81.0	
15	187	...	...	72.0	...	81.4	Sunday.
16	187	...	...	77.6	0.03	72.6	
17	187	...	...	78.6	0.02	68.1	
18	187	...	...	77.7	...	74.6	
19	187	...	...	77.2	...	74.5	
20	185	1	5.41	75.1	...	73.3	
21	196	1	5.10	78.0	...	76.8	
22	196	...	...	75.5	...	86.8	Sunday.
23	196	1	5.10	75.2	1.77	89.1	
24	196	...	...	79.4	0.09	78.0	
25	196	...	...	79.5	...	70.0	Public Holiday.
26	196	...	...	75.1	...	70.2	Public Holiday.
27	195	...	...	74.5	0.15	85.0	
28	194	1	5.15	79.1	0.24	75.4	
29	193	...	...	78.4	...	78.3	Sunday.
30	192	...	...	80.4	0.19	79.1	
31	190	...	...	81.0	...	77.9	
	184	5	27.17	77.4	2.76	74.8	

SUMMARY of the Monthly Tables and Chart of Malarial Fever, Temperature, Rainfall, and Relative Humidity at Port Louis, Mauritius, for the year 1889.

SUMMARY OF THE MONTHLY TABLES.

MONTHLY ABSTRACT.

Month.	Mean Monthly Strength of Troops.	Admissions with Malarial Fever.	Ratio per 1,000 of Strength.	Mean Monthly Temperature in the Shade, Fah. deg.	Monthly Rainfall, Inches.	Mean Monthly Relative Humidity, Saturation =100.	Monthly Order of Unhealthiness from Malarial Fever.	Mean Monthly Ratio of Admissions with Malarial Fever per 1,000 of Strength =92.
January .	224	30	134	78.4	12.74	82.1	3	Above.
February .	172	43	250	78.0	5.51	78.5	2	Above.
March .	141	64	454	78.9	17.09	84.3	1	Above.
April .	142	6	42	76.8	4.65	78.0	5	Below.
May .	190	17	89	72.5	1.51	79.1	4	Below.
June .	215	3	14	69.9	1.53	74.9	9	Below.
July .	385	12	31	70.0	2.21	75.8	7	Below.
August .	476	4	8	69.2	3.68	71.4	12	Below.
September	450	6	13	69.7	1.53	74.1	10	Below.
October .	208	2	10	73.3	1.20	72.2	11	Below.
November	186	6	32	74.3	1.78	72.9	6	Below.
December	184	5	27	77.4	2.76	74.8	8	Below.

QUARTERLY ABSTRACT.

Quarter.	Mean Quarterly Strength of Troops.	Admissions with Malarial Fever.	Ratio per 1,000 of Strength.	Mean Quarterly Temperature in the Shade, Fah. deg.	Quarterly Rainfall, Inches.	Mean Quarterly Relative Humidity, Saturation =100.	Quarterly Order of Unhealthiness from Malarial Fever.	Mean Quarterly Ratio of Admissions with Malarial Fever per 1,000 of Strength =255.
1st . .	179	137	765	78.4	35.34	81.7	1	Above.
2nd . .	182	26	143	73.1	7.69	77.3	2	Below.
3rd . .	437	22	50	69.6	7.42	73.7	4	Below.
4th . .	193	13	62	75.0	5.74	73.3	3	Below.

HALF-YEARLY ABSTRACT.

Half-year.	Mean Half-yearly Strength of Troops.	Admissions with Malarial Fever.	Ratio per 1,000 of Strength.	Mean Half-yearly Temperature in the Shade, Fah. deg.	Half-yearly Rainfall, Inches.	Mean Half-yearly Relative Humidity, Saturation =100.	Half-yearly Order of Unhealthiness from Malarial Fever.	Mean Half-yearly Ratio of Admissions with Malarial Fever per 1,000 of Strength =558.
1st . .	180	163	905	75.7	43.03	79.5	1	Above.
2nd . .	315	35	111	72.3	13.16	73.5	2	Below.

YEARLY ABSTRACT.

Year.	Mean Yearly Strength of Troops.	Admissions with Malarial Fever.	Ratio per 1,000 of Strength.	Mean Yearly Temperature in the Shade, Fah. deg.	Yearly Rainfall, Inches.	Mean Yearly Relative Humidity, Saturation =100.	—	—
1889 .	248	198	798	74.0	56.19	76.5	...	...

Chart of MALARIAL FEVER, TEMPERATURE RAINFALL, and RELATIVE HUMIDITY, at Port Louis, Mauritius, for the Year 1889.