Special Publications of the Institute of Jamaica. No. 1.

THE

# RAINFALL OF JAMAICA

THIRTEEN MAPS SHOWING THE AVERAGE
RAINFALL IN EACH MONTH AND
DURING THE YEAR

WITH EXPLANATORY TEXT

BY

MAXWELL HALL, M.A., F.R.A.S., F.R.M.S.

Barrister-at-Law, Jamaica Government Meteorologist, and Honorary Member of the Institute of Jamaica



THE INSTITUTE OF JAMAICA, KINGSTON, JAMAICA
LONDON: EDWARD STANFORD, 26 & 27, COCKSPUR STREET
CHARING CROSS, S.W.



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STAMFORD STREET AND CHARING CROSS.

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## THE RAINFALL OF JAMAICA.

THESE Maps are based upon rainfall registers kept at 153 stations in Jamaica, from about the year 1870 to the end of the year 1889. A full account of the rainfall during the first decennial period, namely from 1870 to 1879 inclusive, will be found in "Weather Reports" Nos. 31 and 33; and the numerical details employed in the construction of these Maps will be found in Weather Report No. 124 (A).

It is to be understood, however, that these registers have been kept for very unequal lengths of time; some were commenced before 1870 and have been continued up to the present time; some were commenced about 1870 and have been discontinued; and many were commenced about 1880. But tables will be found in Weather Report No. 124 (A) containing the average rainfall for each station for each month of the year, and for the year itself, where the rainfall has been carefully and regularly observed for at least five years; and these averages were employed in the formation of the Maps.

The stations are distributed very irregularly: they are for the most part sugar-estates and cattle-pens; so that all the results deduced apply rather to the land under present cultivation than to the general area of Jamaica.

Again, the results are affected by errors due to imperfect gauges, bad positions of the gauges, and carelessness on the part of the observers; but, noticing that such effects on the results obtained from a large number of gauges will remain nearly constant from year to year, the *comparison* of the results from year to year will be nearly free from such effects. Thus we may compare the rainfall in the first decennial period with that in the second decennial period, the amount of error due to these causes being nearly the same in each period.

In consequence of the irregularity in the distribution of the stations, the Island was divided into four rainfall divisions:—North-castern, Northern, West-central, and Southern. Now, if the average rainfall be obtained for each division, the average rainfall for the whole Island may be obtained by adding together the average for each division and by dividing by four, no matter how many gauges may be registered in one division and how many in another.

We shall now compare the rainfall during the first decennial period with that during the second decennial period, namely from 1880 to 1889 inclusive.

It will be noticed in the following table that although the average rainfall is almost identical in the two periods, namely 67:41 and 66:54 inches respectively, yet the large variations show that this agreement is probably due to chance, The heavy rains in May and October, 1870, in May, 1877, in October, 1879, in

Published monthly by the Jamaica Government Meteorologist.

<sup>†</sup> Two or three stations were admitted as exceptions to this rule on account of their geographical importance to the Maps.

THE	ISLAND	MONTHLY	RAINFALL.	FROM	1870	TO 1	rSSo.

VEAR.	Jan.	Feb.	March.	April.	May.	June.	July.	August.	Sept.	Oct.	Nov.	Dec.	TOTAL
	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins	Ins.	Ins.	
1870	3'99	4.35	3.10	2.79	17:38	3.28	4'33	5.72	8.02	16.74	12.20	6.90	89.43
1871	2'40	1.60	2.29	3.46	6.43	1.98	3.79	3'46	5.40	8.88	5.88	4'22	50'09
1872	3.00	2.84	3.06	2.06	5.18	2'41	2.89	5.54	4'55	6.09	3.13	4'73	45'18
1873	8.12	1.94	5.47	1,12	2.06	2.28	2.26	7.21	10.43	8.57	3.23	5.81	63.06
1874	3'44	2 20	0.01	4.40	10.65	3.96	2.21	9.65	6.82	11.69	10.25	2 49	68.94
1875	2.22	0.67	2.29	3.02	8.24	3.4	3.87	5.13	7.60	5.28	2.34	6.4	52'42
1876	6.00	0.96	1.63	4.68	8.24	5.40	8.12	2.00	5.19	11.36	8.96	5'72	71.35
1877	5'94	1.18	2.38	2.91	12.03	6.20	4.68	1.76	2.01	4.20	7.63	7.88	68.40
1878	6.35	2.80	2.48	0.70	4.86	6.63	5.85	10.80	7.43	11.29	7.32	9.61	76.42
1879	2.81	2.30	6.49	7.28	9.14	10.64	4.47	12,35	7.38	15.96	5.59	1.46	88.84
Means.	4.46	2.38	3.34	3.52	9.05	4.74	4.31	6.66	6.85	10.02	6.41	5.29	67.41
188o	4.36	0.96	1.10	2.77	11.60	3.09	3.86	9.58	3.97	4.00	2.21	7.94	55.44
1881	1.22	4'01	1.30	4.63	10.58	5.56	4.77	6.21	7.68	12.08	7.52	3 34	68.60
1882	2.92	i 93	3.24	3.32	8.22	2.33	3.76	4.80	8.78	8.96	5.36	3.95	57.87
1883	5.49	3.20	4'08	3'34	5.29	4.98	3'15	5.42	7.82	8.12	5.12	2.92	59.26
1884	4.72	3.44	2.21	1.85	6.72	6.89	2.25	5.06	6.53	9.22	2.∞	2.44	56.90
1885	1.43	1.49	1.47	4.73	4'90	3.35	3.01	6.19	6.22	6.37	4.74	15.69	59.86
1886	2.53	4.65	2.68	6.39	5.30	23.36	6.22	13.24	5.00	7.98	3.40	5.66	90.61
1887	6.03	2.32	2.38	4'47	9.35	8.89	7.19	6.91	5.77	8.47	8.17	0.72	70.66
1888	1.36	1.89	1.40		21.54	6.77	2.65	5.47	8.10	4.38	4.29	10.32	72.11
1889	4.48	0.90	4.19	6.41	7.82	12.22	6.08	2.15	8.30	10.49	4:37	2.97	74.12
Means.	3.48	2.21	2.49	4.18	9'07	7:77	4.35	6.83	6.87	8.04	5.08	5.60	66.54

December, 1885, in June, 1886, and in May, 1888, are so far above the average that the results are influenced by these "flood-rains"; and it therefore follows that the average rainfall for any decennial period will depend on the flood-rains experienced in that period. Also that the constancy or variation of the Island rainfall cannot be gathered from two or three decennial periods; a century is required for this purpose.

It also follows that the amount of rain in any year does not afford a true indication of the general prosperity in that or the next year; flood-rains do more harm than good to the general community; and agricultural prosperity depends more upon the way in which the rains fall during the year than upon their amount at any time of the year.

The variation of the rainfall from month to month is very apparent in both periods; the May and October "seasons" are well marked, but subject to great irregularities.

We have now to consider the rainfalls in the four divisions.

THE ANNUAL RAINFALL FOR EACH DIVISION FROM 1870 TO 1889.

100		Divi	sions.		The Island
YEAR.	N.E.	N.	w.c.	s.	Inc Island
	Inches.	Inches.	Inches.	Inches.	Inches.
1870	110.60	83.09	102'98	61.02	89.43
1871	69.45	41.88	54.26	34.46	50.09
1872	59 42	40.79	51.20	29.02	45.18
1873	84.08	52.64	67.79	47.71	63.06
1874	97.18	68.25	62.97	47 ' 35	68.94
1875	71.89	47'15	56 16	34 47	52.42
1876	90.38	54.71	87.33	52.99	71.35
1877	100.45	56.23	64.06	52.27	68 40
1878	104,15	62.99	72.44	66.11	76.42
1879	122.22	65.44	87.54	79.85	88.84
Means.	91.04	57°34	70.73	50.23	67.41
1880	76.37	47.01	64.91	33.47	55°44 68°60
1881	91.24	49.42	75.32	58.42	
1882	65.48	43.76	78.59	43.67	57.87
1883	72.30	41.25	78.19	45.03	59.26
1884	69.00	41.87	73.10	43.63	56.90
1885	70.22	52.77	72.62	43.22	59.86
1886	156,61	60.98	88.51	86.64	90.61
1887	80.25	61.07	80.14	61.16	70.66
1888	98.00	54'42	70.43	65.28	72.11
1889	99.81	56.82	75.94	64.02	74.12
Means.	84.96	50.96	75*74	54.21	66.24

Here we see that the north-eastern division has the largest rainfall; then comes the west-central; then the northern; and lastly the southern.

But between the two decennial periods there was a curious shifting of the rainfall from the north-east and northern divisions to the west-central and southern divisions. In the second decennial period both the north-eastern and northern lost six inches, while the west-central gained five, and the southern gained four; so that the whole island lost somewhat less than one inch.

Such variations are due to the flood-rains chiefly falling in different localities. The rainfall divisions were not arbitrarily made; the north-eastern and northern divisions of the Island have winter rains in November, December, and January; the north-eastern and west-central divisions have summer rains; and the southern division is dry, having rains for the most part only during the May and October seasons.

Now it so happens that when Dr. Hans Sloane \* was in Jamaica, as physician to the Duke of Albemarle, Governor of Jamaica in the year 1687, he noticed the May and October rains; the winter rains on the north side, the summer rains on the central hills, and the small rainfall on the southern plains. Consequently the chief characteristics of the Jamaica rainfall have not altered for two hundred years.

It is not our present object, however, to consider the details of these rainfall divisions which are so useful for statistical purposes; we have rather to explain the Rainfall Maps, which are coloured so as to represent the rainfall over different areas for each month of the year, and for the year itself.

JANUARY.—Over the north-eastern part of the Island there are heavy winter rains of ten to fourteen inches, which diminish westwards and southwards, no doubt more gradually than is shown by the colouring; but an abrupt scale of colouring, such as that adopted, is necessary for the correct printing of the Maps and their subsequent use.

FEBRUARY.—The winter rains have nearly disappeared; the gauge at the Blue Mountain Peak alone showing heavy rainfall. And clearly this is the driest month of the year, although the effects, such as want of grass and water, are not, as a rule, felt until March.

MARCH.—Refreshing showers now sweep the central parts of the Island, leaving the northern and southern parts still very dry.

APRIL.—There are curious patches of colour in the east, and also in the west, where the west-central division now makes its appearance; and it will be noticed that the sources of the Black River (and perhaps those of the Great River) are replenished very distinctly.

MAY.—Very heavy rains fall in the parish of Portland; heavy rains fall over the central parts of the Island from east to west; and moderate rains fall on the northern and southern parts, with the exception of a very few places near the seashore. These rains are accompanied by thunder-storms, which continue to the end of September.

JUNE.—The rainfall this month exhibits strangely curved figures, and shows the necessity of Maps, however roughly drawn. More stations are required in the central parts of the Island in order to trace these outlines correctly.

<sup>\*</sup> Afterwards Sir Hans Sloane, the founder of the British Museum. See his 'Natural History of Jamaica.'

JULY.—The rains are for the most part light and follow the central hills from east to west.

AUGUST.—Moderate rains fall in the north-eastern and west-central parts; and light rains fall over the rest of the Island.

SEPTEMBER.—The rains fall as in August.

OCTOBER.—Heavy rains fall over the north-eastern and west-central parts; and moderate rains fall over the rest of the Island. In April, June, August, and September we saw that the Island was divided into eastern and western rainfall regions by a central and drier part. This is more clearly marked in October; and it is difficult to explain. In Kingston the surface winds are from the southeast, and no doubt are generally strong enough to blow the rain-clouds inland; but this sea-breeze does not extend far inland; and in October the sea-breeze is light, lighter even than in May; so that this peculiar distribution cannot be due to surface winds. Neither is it due to mountain ranges; nor yet to local thunder-storms, because they abate during this month.

NOVEMBER.—A general subsidence now occurs, leaving us winter rains on the north-eastern division.

DECEMBER.—The winter rains increase. These, at least, we can understand; the winds now set in from the north-east, and deposit their moisture on the hills which oppose them, in Jamaica, as in every other country in the world where similar action occurs.

THE YEAR.—For this Map the scale of colouring is, of course, different from the scale for the Monthly Maps.

The distribution of the rainfall resembles that of October, and varies from thirty to thirty-five inches in a few places to over one hundred inches in the north-eastern division.

There are two stations in the west-central division where the rainfall is over one hundred inches, namely Great Valley and Windsor Forest; and at Brokenhurst, in Manchester, the rainfall is one hundred inches; but perhaps longer registration may reduce these figures, enlarged by recent flood-rains.

The driest stations are on the north-west and south-eastern shores; the four estates, Running Gut, Rose Hall, Success, and Cinnamon Hill, are remarkably dry, with strong surface winds from the east-north-east; and the land from Portland Point to Kingston is also remarkably dry, with strong surface winds from the south-east. And these dry localities confirm, as it were, the division of the Island into eastern and western rainfall regions by a central and drier part extending from Kingston to Rose Hall.

The utility of these Maps is sufficiently obvious; if the agriculturist wants constant and heavy rains, he will find them as a rule in the parishes of Portland and St. Mary; if he wants heavy summer rains, he will find them in the west-central parts of the Island; if he wants a moderate rainfall all the year round, he will find it in the area between Chapelton and Linstead, Albion and Cave Valley. Not that he will, perhaps, secure such rainfall in any one year; but that, taking one year with another for a series of years, he may count upon the rainfall laid down upon these Maps.

MAXWELL HALL.

MAP SHOWING THE AVERAGE RAINFALL OVER JAMAICA FOR THE YEAR

Haughton Grove

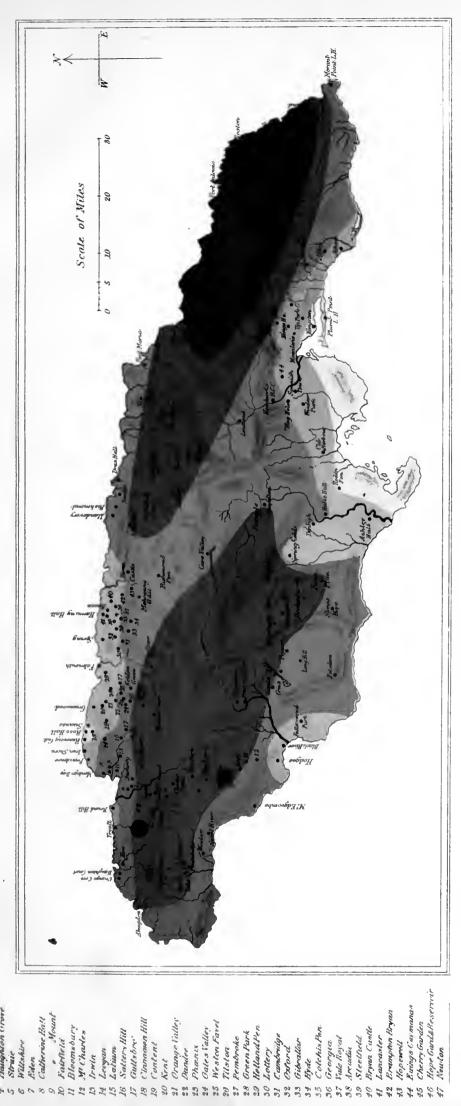
Machineld

8 Catherine Eat!

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Reference Nos.

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22 Phanies 23 Phanix 24 Gales Valley 25 Weston Favel

Tilston

21 Orange lalles

27 Pembooke 28 Green Park 29 Holland Pen 30 Lottery 31 Cambridge 32 Oxford 33 Gibrallar

34 Hyde 35 Colchis Pon

36 Georgia 37 Fale Royal 38 Arcadia 39 Steetheld 40 Bryan Cuette Bryan Cuate

18 Chraman Hill

Gullsbro 19 Content

Laimm Sattery Hill

12 M. Charles

Weather Report Nº 124

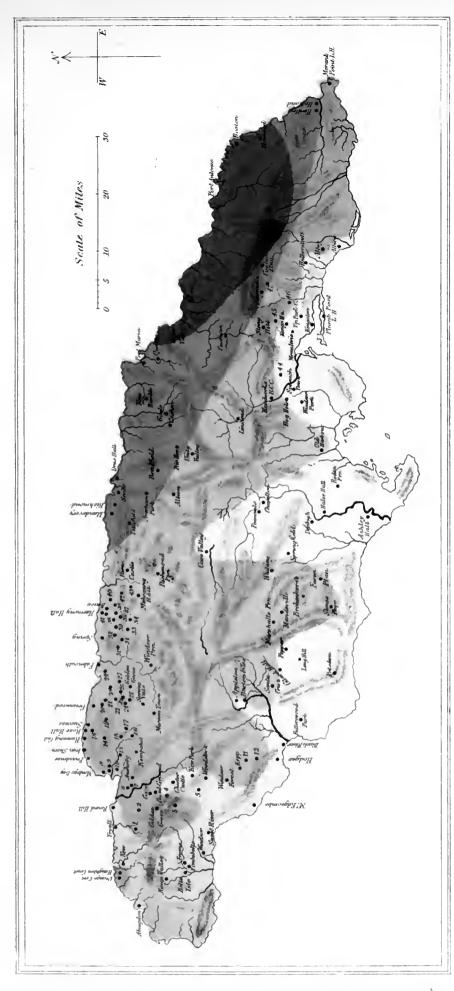
Inches of Rainfall



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1 Givest Villey
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6 Withshire
7 Liden
8 Catherne Hill
9 Fuirfield
11 Bleemsbury
12 M Churdes
13 Merit
14 Leegun
15 Latimus
16 Satterne Hill
18 Content
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19 Content
19 Content
20 Kent
21 Crange Ville
22 Westen firet
23 Phenix
24 Cates Satte
25 Westen
26 Geeryt
27 Pendrode
28 Geeryt
29 Holland Pen
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24 Cates Satte
25 Westen
26 Geeryt
27 Pendrode
28 Geeryt
28 Geeryt
29 Holland Pen
20 Lottery
31 Lottery
32 Criteris Pen
35 Creenied
40 Bryan Castle
41 Lancaster
42 Livenpohn Bryan
43 Moperst
44 Europen
45 Cherry Garden
46 Rope Gards Reserve
47 Newton
47 Newton

MAP SHOWING THE AVERAGE RAINFALL OVER JAMAICA FOR THE MONTH OF JAN.



Weather Report Nº 124





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MAP SHOWING THE AVERAGE RAINFALL OVER JAMAICA FOR THE MONTH OF FEB.

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Guilsbro

Prange Valley

Phanix Gales Valles

25 Nesten Fired
24 Theten
27 Pembeoke
28 Green Park
29 HottandPen
30 Lattery
31 Cambridge
32 Grand

34 Hyde
35 Colchiston
56 Colchiston
58 Teleficycul
38 Acculin
30 Steelteid
40 Brywn Cartle
41 Lounphaliry
42 Lounphaliry

44 Evengs Carmanas 45 Cherry Garden 46 Hope Garl&Reserver 47 Newton

Inches of Painfall

Weather Report Nº 124

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MAP SHOWING THE AVERAGE RAINFALL OVER JAMAICA FOR THE MONTH OF MARCH

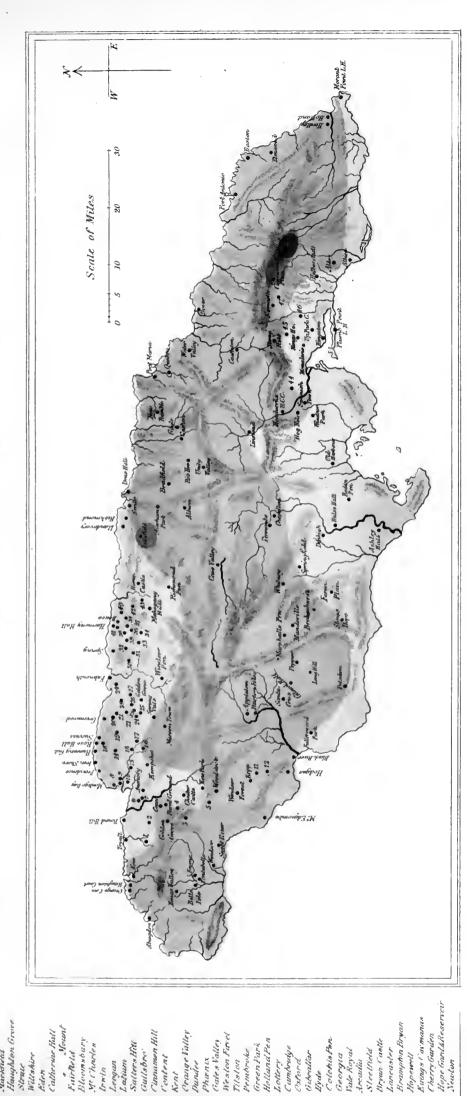
Haughlon Grove

Willshire

Cacoon Castle Mackfield

Great Salley

Reference Nos.



Prange Valley Dundee

Weston Farel

23 Hollund Pen GreenPark

Colchistor

39 Steetfield Lancaster

innamon Hill

Content

Salters Hill

Weather Report Nº 124





forest falley Caron Fastle Machield Haughlen firere

MAP SHOWING THE AVERAGE RAINFALL OVER JAMAICA FOR THE MONTH OF APRIL

Scale of Miles

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8 Catherine Hall

Bloomsbury M. Charles

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18 Cintamen Hill
19 Centent

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25. Westen Fusel
26. Tisston
27. Neutrologe
28. Green Punk
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35. Neutrolin
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Weather Report Nº 124

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Great Valley Cacoon Castle Mackield Haughton Grov

MAP SHOWING THE AVERAGE RAINFALL OVER JAMAICA FOR THE MONTH OF MAY

Catherine Hall National

9 Suinfeeld
11 Billownsbury
12 McCharles
13 Invita
14 Levyan
15 Javium
16 Salters Hill
16 Gallsbro'
18 Charantu IIII
19 Conteat
20 Kent
20 Kent
21 Prante
22 Hanne
23 Horant
24 Gales Valley
25 Weston
25 Weston
26 Green Park
27 Pensbrok
28 Green Park
29 Hilland Pen
20 Ment
21 Pensbrok
23 Green Park
24 Gales Valley
25 Weston
25 Weston
26 Green Park
27 Pensbrok
28 Green Park
29 Hilland Pen
20 Titlend Pen
21 Pensbrok
22 Green Park
23 Green Park
24 Gales Valley
25 Green Park
26 Green Park
27 Pensbrok
28 Green Park
28 Green Park
29 Sibrodiar
38 Green Park
38 Sibrodiar
38 Sibrod

41 Luncaster 42 Brompton Bryan 43 Hapewell

44 Ewings Cormanus
45 Cherry Garden
46 Hope Gard&Reservir

Inches of Painfull

Weather Report Nº 124

30 Scale of Miles 10

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MAP SHOWING THE AVERAGE RAINFALL OVER JAMAICA FOR THE MONTH OF JUINE

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Timamen Hill

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30 Lettery 31 Cambridge

Green Purk

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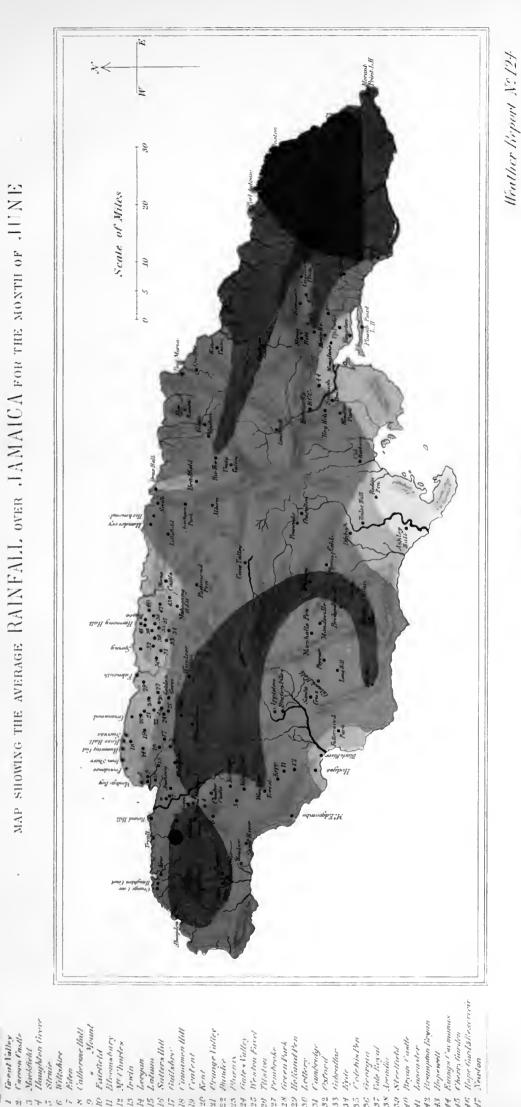
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38 Arrentice

35 Colonialin

33 Hickoryllar

36 Georgia 37 Vale Payal



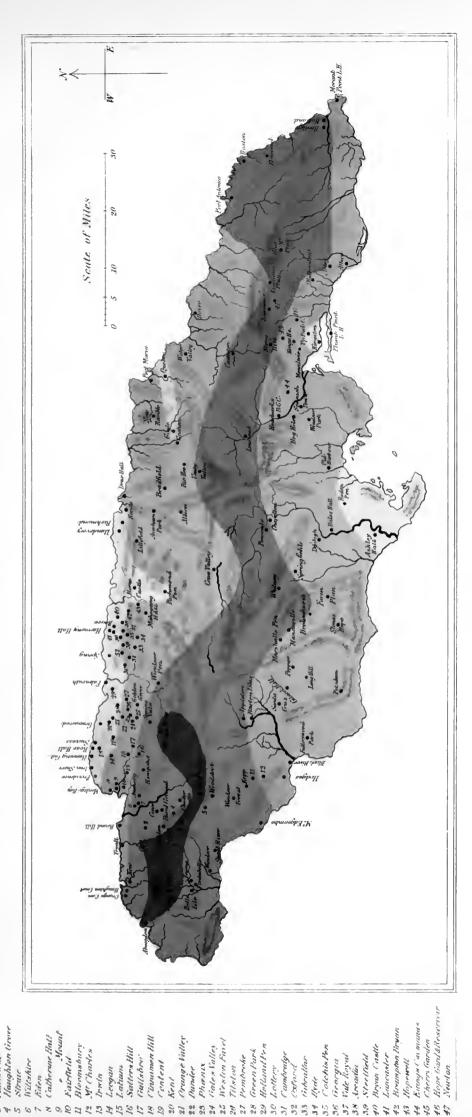
Inches of Burnfull



Reference Nos.

Great Valley Camon Castle

Willshire



24 Gales Valler 25 Westen Favel

23 Phirmix

Green Park

Pembroke

Tilston

Colchiston

33 Gebrattar

Bryon Castle

39 Stoellield Lancaster

Satters Hill

Guilsbro

Weather Report Nº 124





Reference Nos.

Great Valley

Catherine Pall

Walshire

18 Chrammen Hill 20 Kent 21 Orange Valley

23 Irwin 14 Leogan 15 Latium 16 SattersHill 17 Gullsbro

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25 Phenux 24 Gales Valley

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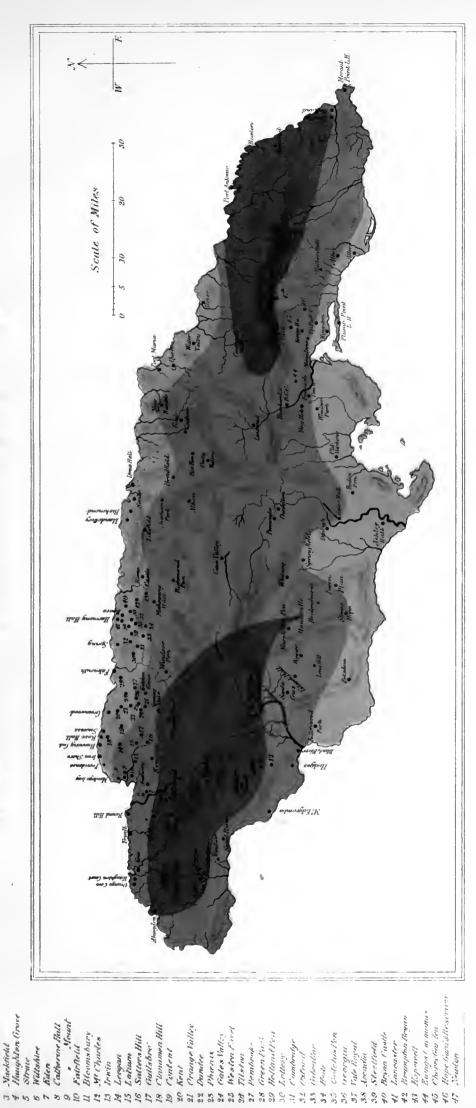
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32 Oxford
33 Gibertlar

35 Vate Regal 38 Areadia 39 Steellield

42 Brownpoton Be

Lancaster



Weather Report Nº 124

Inches of Patinfall



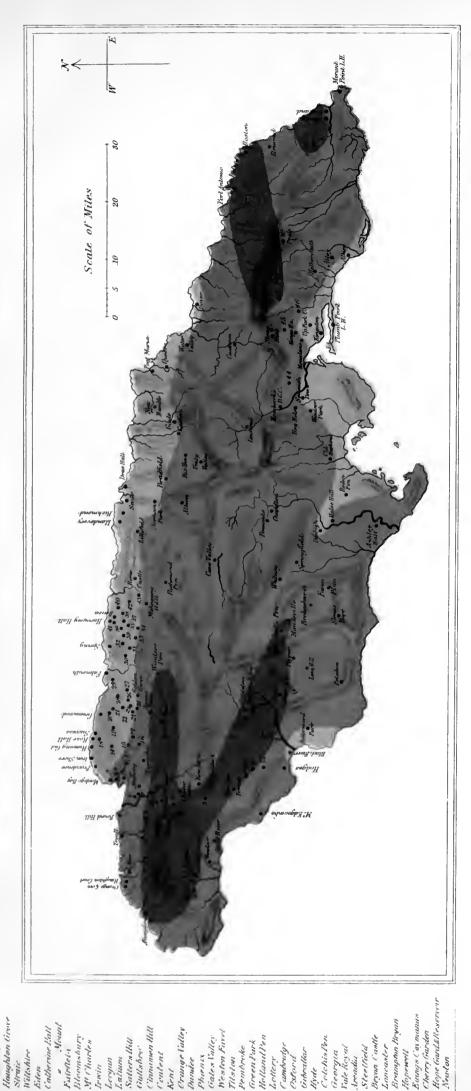


MAP SHOWING THE AVERAGE RAINFALL OVER JAMAICA FOR THE MONTH OF SEPT.

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Gates Valley Neston Favel

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Phuenix

HollandPen

28 Green Park

CotchisPen

Cimmon Hell

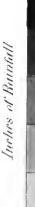
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Satters Hill

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Weather Report Nº 124

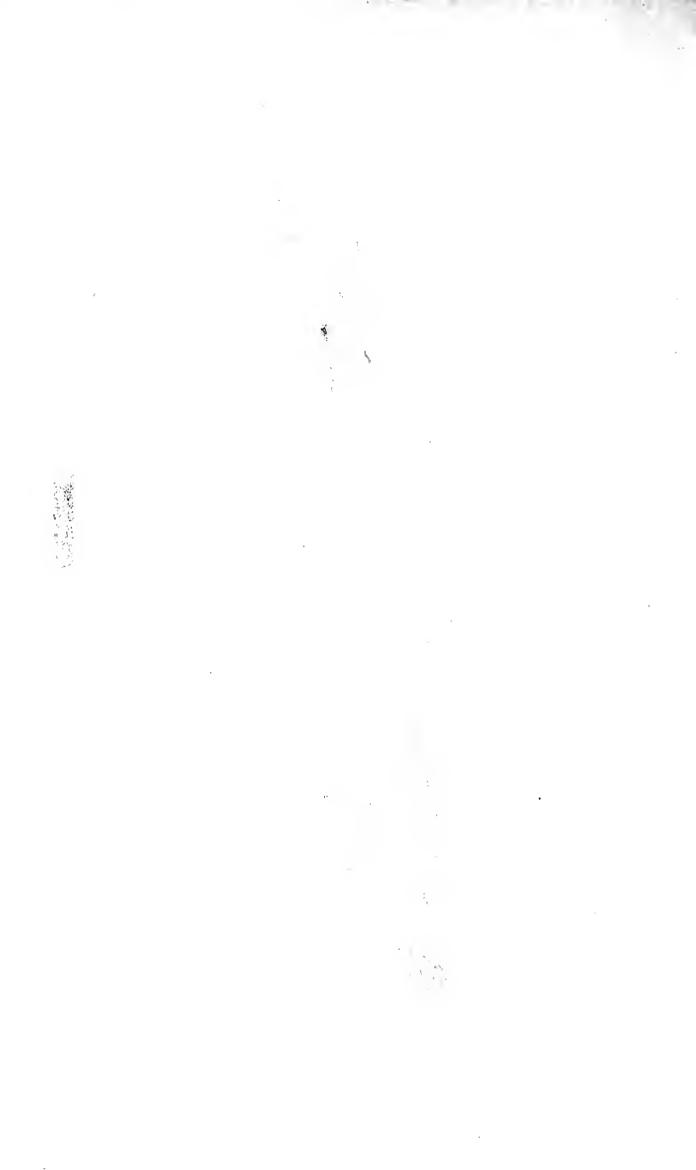


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Errempton Bryan

Beran Cartle

Steelfield Lancaster



MAP SHOWING THE AVERAGE RAINFALL OVER JAMAICA FOR THE MONTH OF OCT.

Haughton Grove

Catherine Hall

Willshire

Bloomsbury M. Charles

21 Prange Valley

Westen Favel

26 Titstan

29 Holland Pen

28 GreenPark

23 Phanix 24 Gales Valley

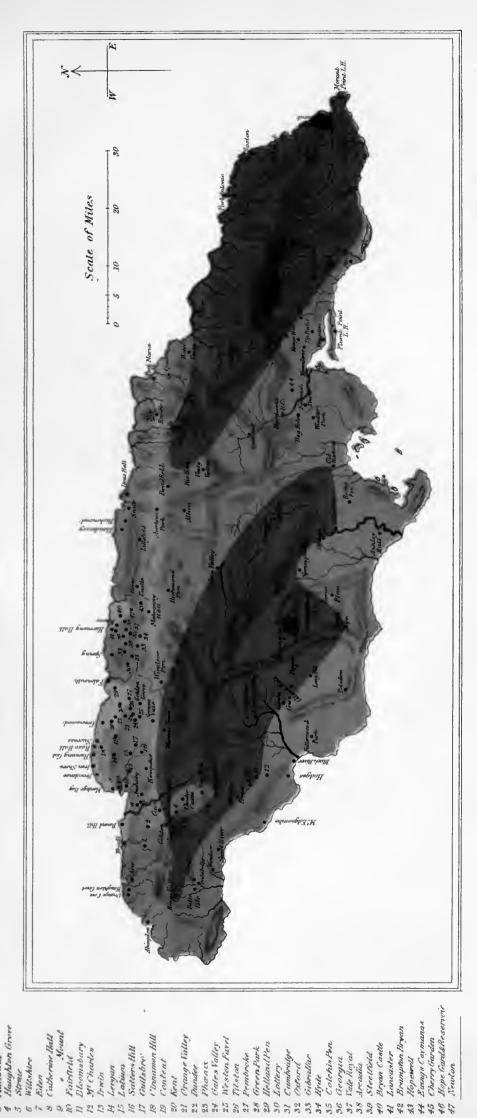
18 Cirmannon Hill

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Cuilsbro

Sutters Hill

Reference Nos.



Weather Report Nº 124



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45 Cherry Garden

Brumpton Bryan

40 Bryan Castle

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MAP SHOWING THE AVERAGE RAINFALL OVER JAMAICA FOR THE MONTH OF NOV.

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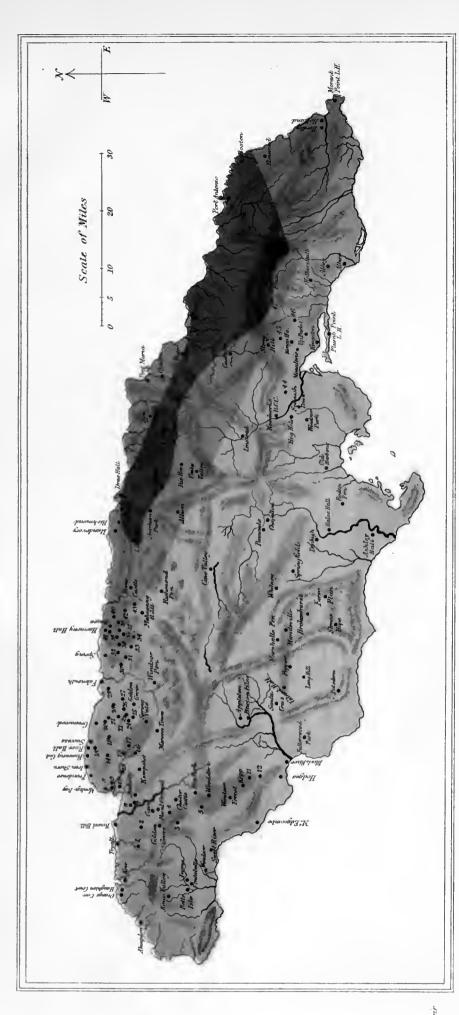
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Inches of Rainfall

Weather Report Nº 124



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MAP SHOWING THE AVERAGE RAINFALL OVER JAMAICA FOR THE MONTH OF DEC.

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Inches of Rainfall



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