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TROPICAL PLANT RESEARCH FOUNDATION

BULLETIN NO. 1

Rainfall and Temperature of Cuba

BY

OLIVER L. FASSIG

Meteorologist in Charge of West Indies
and Caribbean Service, United
States Weather Bureau.

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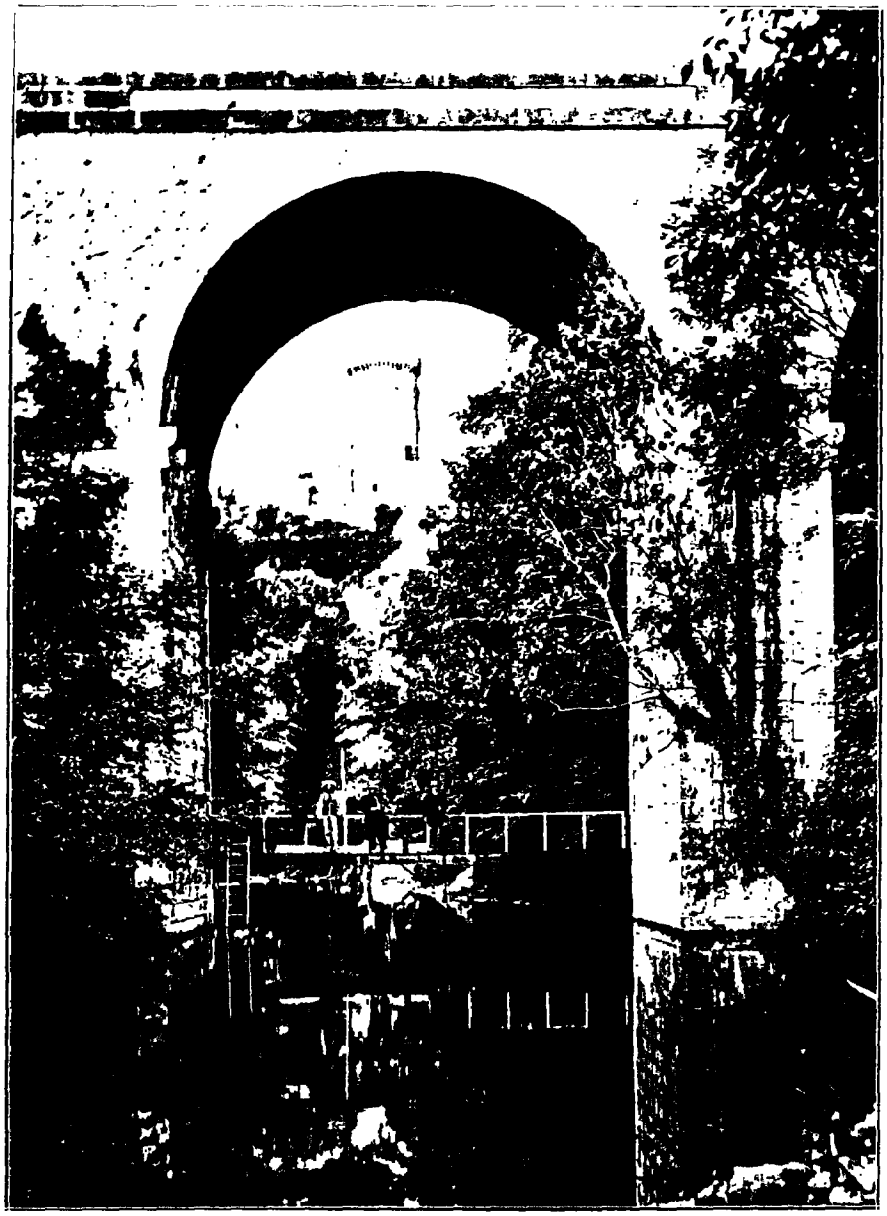

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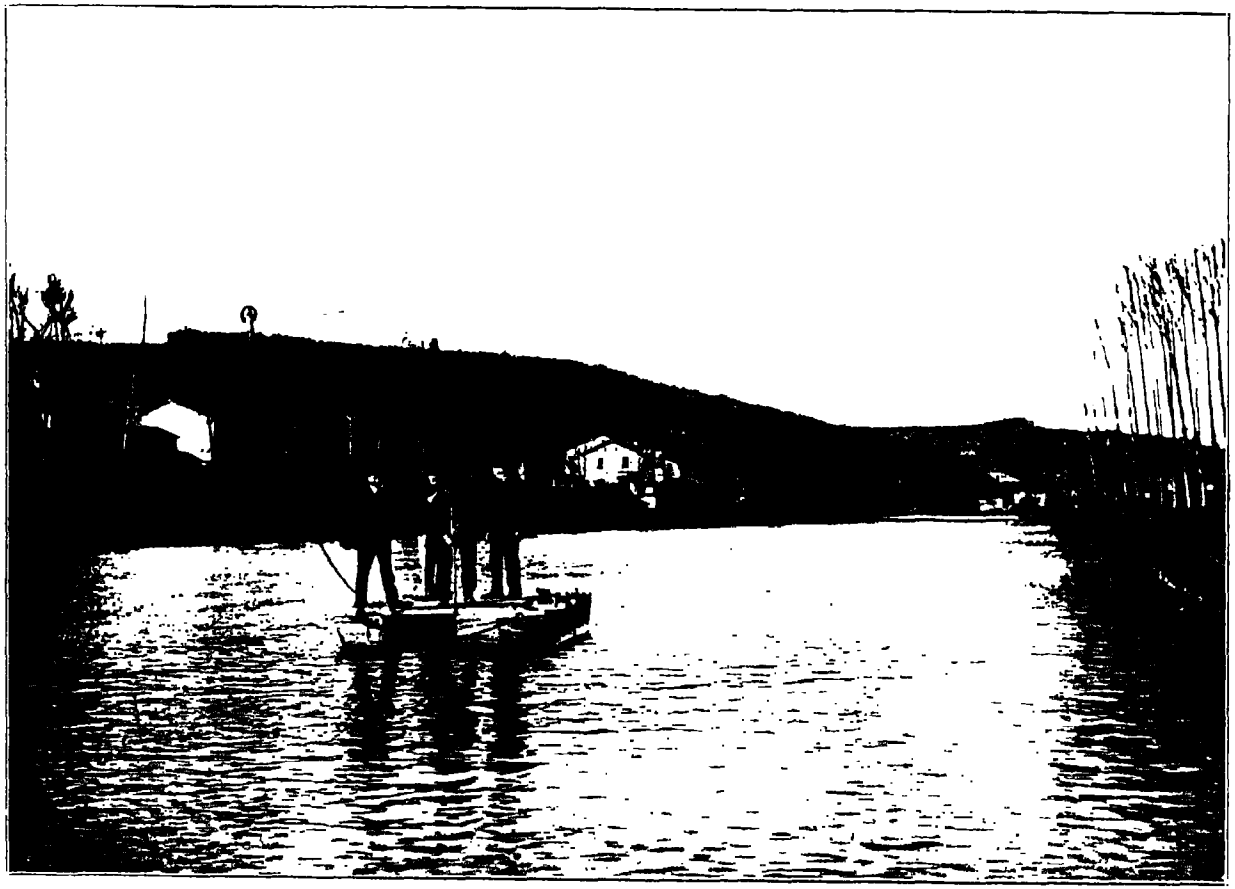

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INTRODUCTION

The Tropical Plant Research Foundation has undertaken a study of the sugar cane production problems of Cuba, with the support of fifty-seven mills affiliated with the Cuba Sugar Club.

In planning this work, consideration was given to such weather factors as would influence the selection of suitable localities for field experimental stations, and to the gathering of data on the relation of weather to sugar cane production.

The Weather Bureau of the United States Department of Agriculture has contributed to this end a tabulation of rainfall and temperature records and a graphic presentation of the essential features of the climate of Cuba, which is published in this form for reference use by agricultural workers.

The cooperation of the Weather Bureau and of the National Observatory of Cuba is gratefully acknowledged.

W. A. Orton,
Scientific Director.

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RAINFALL AND TEMPERATURE OF CUBA

BY

OLIVER L. FASSIG, *Meteorologist.*

The Island of Cuba is entirely within a region of comparatively uniform and moderately high temperatures, temperatures which are always safely above the freezing point and free from the violent and damaging fluctuations which characterize the higher latitudes. The weather factors of greatest concern to the planter in Cuba are the amount and the distribution of rainfall.

Excellent published records of rainfall and temperature for Cuba are available for the period from June, 1899, to date. The monthly and annual amounts of rainfall from 1902 to 1920 were tabulated in the office of the Chief of the U. S. Weather Bureau from the published reports of the Cuban Minister of Agriculture. The earlier records from June, 1899, to April, 1902, were taken from the reports of the Cuban Section of the Climate and Crop Service of the U. S. Weather Bureau; the records from 1921 to date have been received regularly through the courtesy of the Director of the National Observatory in Havana, Mr. J. C. Millás, and published in the monthly reports of the West Indies Section of the Climatological Service of the U. S. Weather Bureau. The period covered by the rainfall and temperature records (1899–1924) is one of sufficient length to give us reliable normal values, and departures from the normal.

In the following pages an effort has been made to present the data in such form as to bring out readily the salient features of the rainfall by means of graphic methods and tables, in connection with brief explanations, making extended comment in the text unnecessary. The Cuban rainfall records, like similar records in all parts of the world, show periods of marked departure above or below the average level—periods extending over a few or many successive seasons of excess or deficiency. (See Table II.) Meteorologists have endeavored to show definite periods of recurrence—periods for example of 11 years, 19 years, and 35 years. It can not be said that any one of these periods has been demonstrated to have any value as a basis for predicting the occurrence of dry or wet spells.

A conspicuous feature of Cuban rainfall is the high degree of dependability during the usual crop growing months—from May to November. Since 1900 the average rainfall for the entire Island, based upon observa-

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tions at 19 well distributed stations, has never been less than 2.5 inches for any month during the period from May to November, and has averaged 5.6 inches for the dryest month, as shown in the following table:

Normal monthly rainfall and extreme fluctuations during the period 1900–1924 (in inches and tenths).

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
Greatest	4.2	2.9	4.3	6.2	12.7	15.7	12.8	9.6	10.7	13.1	8.6	7.2	68.3
Least	0.3	0.4	0.1	0.4	2.5	4.4	3.0	2.5	4.8	3.3	0.7	0.2	38.7
Normal	1.9	1.6	2.0	2.8	6.9	8.3	5.6	5.7	7.8	7.0	3.3	2.0	54.8

It will be observed in the above table that the lighter and more fluctuating rainfall is confined to the winter and spring months.

The measure of dependability of rainfall may be expressed by the ratio between the greatest and smallest rainfall of a given period. A ratio of two for the annual rainfall may be considered as very satisfactory, *i.e.*, a minimum rainfall of one-half the maximum. During the 25-year period from 1900 to 1924, the greatest average rainfall for the entire Island was 68.26 inches, in the calendar year 1906, and the least was 38.71 inches, in the year 1907, showing a ratio of 1.8. The ratios for shorter periods than a year, for example for the seasons, naturally show greater variations, but are still very favorable, namely, 2.4 for the summer and 2.2 for the autumn seasons. The winter and spring seasons show a less dependable rainfall. The same result is shown in the table of mean departures from the normal for the different seasons expressed in terms of percentages of the total fall. (See Table III.) The winter quarter shows an average departure of 34 per cent of the normal, spring 21 per cent, summer 15 per cent, and autumn 16 per cent.

Rainfall is evenly distributed geographically, but is heavier over the western provinces and lighter over the eastern provinces. There are marked variations in the seasonal distribution, however, as shown in the tables and diagrams. In all provinces there is a minimum rainfall in January or February with a steady increase to a maximum in May or June, followed by a decrease in July, with a secondary maximum in September or October. The annual rainfall is remarkably uniform in the Provinces of Havana, Matanzas, Santa Clara, and Camaguey, varying only from 59 inches in Matanzas to 54 inches in Camaguey. The greater rainfall of the western portion of the Island is doubtless due in great part to a closer proximity to the average path of the hurricanes in the summer and autumn months, with the accompaniment of heavy rains.

In reference to hurricane frequency and paths it may be briefly stated that Cuba is in the midst of the hurricane belt.* Fortunately, these storms are not of frequent occurrence; they are, however, most likely to occur in the months from July to October when liability to crop damage is greatest. On the whole, the western end of the Island is more likely to suffer injury than the central and eastern portions, as the average path of recurve of the West Indies hurricanes lies close to the western end of Cuba, especially for such storms as occur in September and October.

No statistics are at hand showing the relative frequency of the smaller local storms, or of the accompanying damage to crops. There is apparently, however, no cause for marked local differences.

* For a recent comprehensive discussion of hurricanes in the West Indies the reader is recommended to procure Supplement No. 24, Monthly Weather Review: Mitchell, Charles L. "West Indian Hurricanes and Other Tropical Cyclones of the North Atlantic Ocean." This may be had from the Superintendent of Documents, Government Printing Office, Washington, D. C., price 25 cents.

Any one desiring to receive regularly the monthly paper "Climatological Data West Indies and Carribbean Service" can do so by sending their subscription to the Superintendent of Documents, Government Printing Office, Washington, D. C. The price is 50 cents per year.

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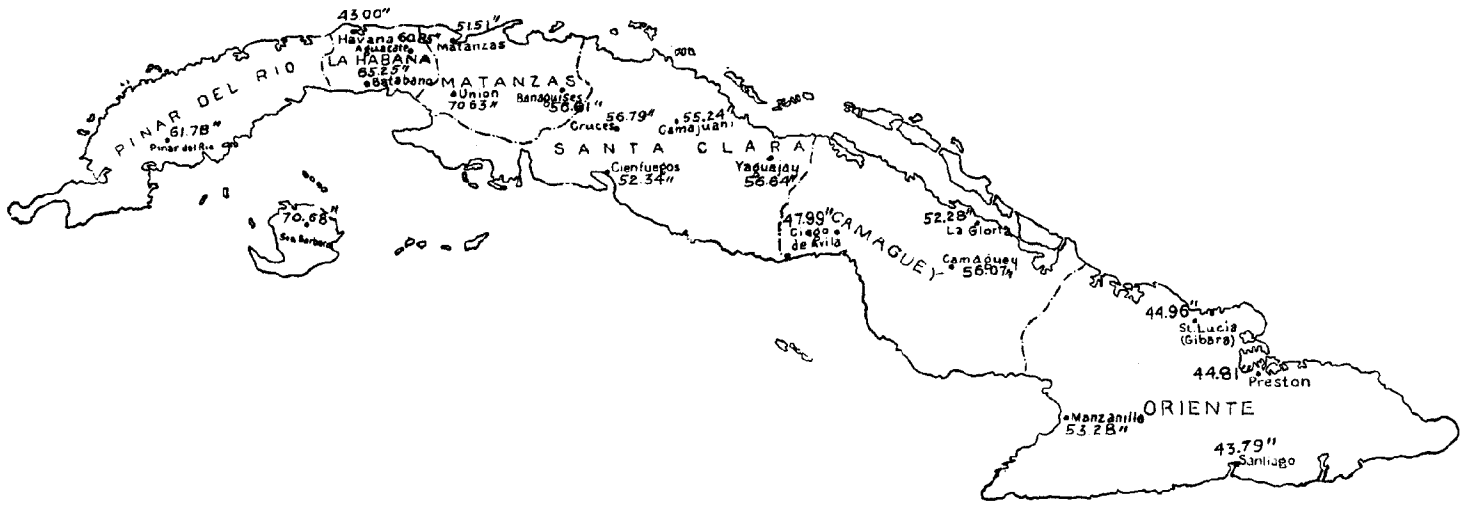

CHART I.

Map of Cuba, showing location of Stations and Normal Annual Rainfall.

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TABLE I.—MONTHLY AND ANNUAL RAINFALL—(MEANS OF 19 STATIONS).

PRECIPITACIÓN MENSUAL Y ANUAL.

Year	Jan.	Feb.	March	April	May	June	July	August	Sept.	Oct.	Nov.	Dec.	Annual
1899	.....	.....	.....	.....	.....	.....	5.07	*2.51*	6.19	9.41	4.86	1.14	.....
1900	2.31	2.32	2.01	2.06	9.75	6.01	5.27	3.70	9.16	4.92	1.77	1.32	50.60
'01	1.85	1.50	1.34	0.64	9.25	8.83	**12.81**	5.14	10.01	6.07	*0.73*	1.86	60.03
'02	1.64	1.67	1.74	3.06	*2.49*	8.55	3.44	7.81	7.84	5.64	2.10	2.88	48.86
'03	3.02	2.08	3.99	0.91	4.26	8.97	6.56	5.98	8.03	5.00	4.56	3.07	56.43
'04	1.15	1.31	2.48	4.34	**12.74**	9.77	4.63	5.38	5.01	8.09	1.59	1.38	57.87
1905	1.14	0.65	3.65	5.59	6.30	6.14	5.68	5.32	7.70	*3.38*	2.31	**7.21**	54.97
'06	2.17	1.66	**4.27**	2.94	7.78	**15.73**	4.79	7.40	9.00	6.23	6.11	*0.18*	**68.26**
'07	0.61	0.86	*0.13*	0.74	3.48	8.49	4.72	5.23	5.34	4.23	2.60	2.28	*38.71*
'08	2.99	1.15	0.65	1.31	5.81	10.19	4.80	7.54	7.72	7.98	2.76	1.34	54.24
'09	2.46	1.87	1.21	2.97	6.83	8.05	7.09	**9.55**	10.36	10.35	1.28	1.06	63.08
1910	1.13	0.68	1.51	0.86	4.76	6.69	5.68	6.35	8.68	**13.07**	1.88	1.92	53.21
'11	0.80	*0.39*	2.43	2.20	8.64	9.34	4.34	5.70	*4.81*	4.58	**8.60**	1.75	53.58
'12	2.35	2.22	2.35	0.99	7.09	12.36	4.11	7.01	6.31	6.29	3.83	1.55	56.46
'13	2.38	2.00	2.53	3.36	6.08	10.63	4.81	6.02	9.24	4.49	3.99	1.97	57.23
'14	4.05	1.91	1.31	5.03	7.43	*4.41*	*3.03*	4.11	6.37	10.06	4.32	3.87	55.90
1915	**4.22**	2.82	3.32	3.98	5.15	7.86	4.79	3.97	6.72	5.74	3.90	3.17	55.64
'16	0.65	0.89	1.39	4.07	4.44	5.40	7.77	6.26	9.11	7.79	5.01	0.49	53.27
'17	*0.30*	1.31	1.86	**6.19**	3.34	6.85	4.40	6.29	7.67	6.08	3.13	2.85	50.27
'18	1.09	0.84	4.08	3.85	4.06	7.26	4.82	3.74	6.06	6.21	2.11	2.98	47.10
'19	2.56	**2.88**	0.91	2.43	8.13	10.71	6.65	3.69	8.79	4.03	2.36	1.42	54.56
1920	1.43	1.89	2.28	3.15	5.72	8.74	6.03	5.21	9.74	7.68	5.77	2.45	60.09
'21	1.60	1.47	1.95	4.06	10.15	7.72	6.73	6.56	5.53	8.46	2.23	0.60	57.06
'22	1.27	1.58	0.67	*0.38*	11.26	6.82	4.63	7.34	8.84	9.58	1.88	1.28	55.53
'23	0.35	0.54	0.63	3.27	11.62	6.60	5.02	5.75	6.57	6.94	1.90	0.40	49.59
'24	3.17	2.79	1.12	1.53	6.36	5.53	6.75	5.48	**10.66**	10.75	4.98	0.78	59.90
Means	1.87	*1.57*	1.99	2.80	6.91	**8.29**	5.56	5.73	7.75	7.04	3.33	1.97	54.81

NOTE: Maximum values in bold-face type; minimum values in italics.

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TABLE II.—DEPARTURES FROM THE NORMAL MONTHLY AND ANNUAL RAINFALL.

DESVIACIÓN DE LA PRECIPITACIÓN NORMAL, MENSUAL Y ANUAL.

Year	Jan.	Feb.	March	April	May	June	July	August	Sept.	Oct.	Nov.	Dec.	Year
1899	.....	.....	.....	.....	.....	−3.27	−0.49	−3.22	−1.56	**+2.37**	**+1.53**	−0.83	.....
1900	**+0.44**	**+0.75**	**+0.02**	−0.74	**+2.84**	−2.28	−0.29	−2.03	**+1.43**	−2.12	−1.56	−0.65	−4.21
'01	−0.02	−0.07	−0.65	−2.16	**+2.34**	**+0.54**	**+7.25**	−0.59	**+2.26**	−0.97	−2.60	−0.11	**+5.22**
'02	−0.23	**+0.10**	−0.25	**+0.26**	−4.42	**+0.26**	−2.13	**+2.08**	**+0.09**	−1.40	−1.23	**+0.91**	−5.95
'03	**+1.15**	**+0.51**	**+2.00**	−1.89	−2.65	**+0.68**	**+1.00**	**+0.25**	**+0.29**	−2.04	**+1.22**	**+1.10**	**+1.62**
'04	−0.72	−0.26	**+0.49**	**+1.54**	**+5.83**	**+1.48**	−0.93	−0.35	−2.74	**+1.05**	−1.75	−0.59	**+3.06**
1905	−0.73	−0.92	**+1.66**	**+2.79**	−0.61	−2.15	**+0.12**	−0.41	−0.05	−3.76	−1.02	**+5.24**	**+0.16**
'06	**+0.30**	**+0.09**	**+2.28**	**+0.14**	**+0.87**	**+7.44**	−0.77	**+1.67**	**+1.25**	−0.81	**+2.78**	−1.79	**+13.45**
'07	−1.26	−0.71	−1.86	−2.06	−3.43	**+0.20**	−0.84	−0.50	−2.41	−2.81	−0.73	**+0.31**	−16.10
'08	**+1.12**	−0.42	−1.34	−1.49	−1.10	**+1.90**	−0.76	**+1.81**	−0.03	**+0.94**	−0.57	−0.63	−0.57
'09	**+0.59**	**+0.30**	−0.78	**+0.17**	−0.08	−0.24	**+1.53**	**+3.82**	**+2.61**	**+3.33**	−2.05	−0.91	**+8.27**
1910	−0.74	−0.89	−0.48	−1.94	−2.15	−1.60	**+0.12**	**+0.62**	**+0.93**	**+6.03**	−1.45	−0.05	−1.60
'11	−1.07	−1.18	**+0.44**	−0.60	**+1.73**	**+1.05**	−1.22	−0.03	−2.94	−2.46	**+5.27**	−0.22	−1.23
'12	**+0.48**	**+0.65**	**+0.36**	−1.81	**+0.18**	**+4.07**	−1.45	**+1.28**	−1.44	−0.75	**+0.50**	−0.42	**+1.65**
'13	**+0.51**	**+0.43**	**+0.54**	**+0.56**	−0.83	**+2.07**	−0.75	**+0.30**	**+1.40**	−2.55	**+0.66**	±0.00	**+2.42**
'14	**+2.18**	**+0.44**	−0.68	**+2.23**	**+0.52**	−3.88	−2.53	−1.62	−1.38	**+3.02**	**+0.99**	**+1.90**	**+1.09**
1915	**+2.35**	**+1.25**	**+1.33**	**+1.18**	−1.76	−0.43	−0.77	−1.62	−1.38	**+3.02**	−0.99	**+1.90**	**+0.83**
'16	−1.22	−0.68	−0.60	**+1.27**	−2.47	−2.89	**+2.21**	**+0.53**	**+1.36**	**+0.75**	**+1.68**	−1.48	−1.54
'17	−1.57	−0.26	−0.11	**+3.39**	−3.57	−1.44	−1.16	**+0.56**	−0.08	−0.96	−0.20	**+0.88**	−4.54
'18	−0.78	−0.73	**+2.09**	**+1.05**	−2.85	−1.03	−0.74	−1.99	−1.69	−0.83	−1.22	**+1.01**	−7.71
'19	**+0.69**	**+1.31**	−1.08	−0.47	**+1.22**	**+2.42**	**+1.09**	−2.04	**+1.04**	−3.01	−0.97	−0.55	−0.25
1920	−0.44	**+0.32**	**+0.29**	**+0.35**	−1.19	**+0.45**	**+0.47**	−0.52	**+2.00**	**+0.64**	**+2.44**	**+0.47**	**+5.28**
'21	−0.27	−0.10	−0.04	**+1.26**	**+3.24**	−0.57	**+1.17**	**+0.83**	−2.22	**+1.42**	−1.10	−1.37	**+2.25**
'22	−0.60	**+0.01**	−1.32	−2.42	**+4.35**	−1.87	−0.93	**+1.61**	**+1.09**	**+2.54**	−1.45	−0.69	**+0.72**
'23	−1.52	−1.03	−1.36	**+0.47**	**+4.71**	−1.69	−0.54	**+0.02**	−1.18	−0.10	−1.43	−1.57	−5.22
'24	**+1.30**	**+1.22**	−0.87	−1.27	−0.55	−2.76	**+1.19**	−0.25	**+2.91**	**+3.71**	**+1.65**	−1.19	**+5.09**
Normals	1.87	1.57	1.99	2.80	6.91	8.29	5.56	5.73	7.75	7.04	3.33	1.97	54.81

NOTE: Plus departures in bold-face type.

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TABLE III.—SEASONAL RAINFALL AND DEPARTURES FROM THE NORMAL.

PRECIPITACIÓN POR ESTACIONES Y DESVIACIÓN DE LA NORMAL.

Year	Winter	Spring	Summer	Fall	For the Year (Dec.–Nov.)	Departures				Year (Dec.–Nov.)
						Winter	Spring	Summer	Fall	
1899	.....	.....	12.60	20.46	.....	.....	.....	−6.93	**+2.44**	.....
1900	5.77	13.82	14.98	15.85	50.42	**+0.32**	**+2.11**	−4.55	−2.17	−4.29
'01	4.67	11.25	26.78	16.81	59.51	−0.78	−0.46	**+7.25**	−1.21	**+4.80**
'02	5.17	7.29	19.70	15.58	47.74	−0.28	−4.42	**+0.17**	−2.44	−6.97
'03	7.98	9.16	21.51	17.59	56.24	**+2.53**	−2.55	**+1.98**	−0.43	**+1.53**
'04	5.53	**19.56**	19.78	14.69	59.56	**+0.08**	**+7.85**	**+0.25**	−3.33	**+4.85**
1905	3.17	15.54	17.14	13.29	49.14	−2.28	**+3.83**	−2.39	−4.73	−5.57
'06	**11.04**	14.99	**27.92**	21.34	75.29	**+5.59**	**+3.28**	**+8.39**	**+3.32**	**+20.58**
'07	1.65	*4.35*	18.44	*12.17*	*36.61*	−3.80	−7.36	−1.09	−5.85	−18.10
'08	6.42	7.77	22.53	18.43	55.18	**+0.98**	−3.94	**+3.00**	**+0.44**	**+0.47**
'09	5.67	11.01	24.69	21.99	63.36	**+0.24**	−0.70	**+5.16**	**+3.97**	**+8.65**
1910	2.87	7.13	18.72	23.63	52.35	−2.58	−4.58	−0.81	**+5.61**	−2.36
'11	3.11	13.27	19.38	17.99	53.75	−2.34	**+1.56**	−0.15	−0.03	−0.96
'12	6.32	10.43	23.48	16.43	56.66	**+0.87**	−1.28	**+3.95**	−1.59	**+1.95**
'13	5.93	11.97	21.19	17.72	56.81	**+0.48**	**+0.26**	**+1.66**	−0.30	**+2.10**
'14	7.93	13.77	*11.55*	20.75	54.00	**+2.48**	**+2.06**	−7.98	**+2.73**	−0.71
1915	10.91	12.45	16.62	16.36	56.34	**+5.46**	**+0.74**	−3.07	−1.50	**+1.63**
'16	4.71	9.90	19.43	21.91	55.95	−0.70	−1.81	−0.10	**+3.89**	**+1.24**
'17	*2.10*	11.39	17.54	16.88	47.91	−3.35	−0.32	−1.99	−1.14	−6.80
'18	4.78	11.99	15.82	14.38	46.97	−0.67	**+0.28**	−3.71	−3.64	−7.74
'19	8.42	11.47	21.05	15.18	56.12	**+2.97**	−0.24	**+1.52**	−3.84	**+1.41**
1920	4.74	11.15	19.98	23.19	59.06	−0.71	−0.56	**+0.45**	**+5.17**	**+4.35**
'21	5.52	16.16	16.01	16.22	53.91	**+0.07**	**+4.45**	−3.52	−1.80	−0.80
'22	3.45	12.31	18.79	20.30	54.85	−2.00	**+0.60**	−0.14	**+2.28**	**+0.14**
'23	2.17	15.52	17.37	15.41	50.47	−3.28	**+3.81**	−2.16	−2.61	−4.24
'24	6.36	9.01	17.76	**26.39**	59.52	**+0.91**	−2.70	−1.77	**+8.37**	**+4.81**
Normals	5.45	11.71	19.53	18.02	54.71	Mean departures from the normal.				
Ratio $\frac{\text{Greatest}}{\text{Least}}$	5.2	4.5	2.4	2.2	2.0	1.87 34%	2.47 21%	2.85 15%	2.93 16%	4.97 inches. 9% of normal

NOTE: Maximum values in bold-face type; minimum values in italics.

NOTE: Plus departures in bold-face type.

TABLE IV.—SEASONAL AND ANNUAL RAINFALL, BY PROVINCES, WITH DEPARTURES FROM THE NORMAL FOR THE YEAR.

PRECIPITACIÓN POR PROVINCIAS, ANUAL Y POR ESTACIONES, CON DESVIACIONES DE LA NORMAL PARA EL AÑO.

(a) (Province of Pinar del Rio.)

Year	Winter	Spring	Summer	Fall	Year (Dec.–Nov.)	Departure*
1899	....	....	13.00	18.17	....	...
1900	10.36	16.52	14.03	10.68	51.59	−11.25
'01	3.77	19.10	36.49	19.98	79.34	**+16.50**
'02	2.51	10.69	25.29	21.86	60.35	− 2.49
'03	5.88	11.49	(25.00)	(14.98)	57.35	− 5.49
'04	6.50	19.00	22.00	9.01	56.51	− 6.33
1905	2.89	11.46	16.89	21.11	52.35	−10.49
'06	17.65	**22.71**	17.19	31.49	**89.04**	**+26.20**
'07	*0.94*	*2.75*	19.10	14.43	*37.22*	−25.62
'08	7.28	3.98	**36.62**	18.21	66.09	**+ 3.25**
'09	2.24	7.99	28.72	**44.48**	83.43	**+20.59**
1910	1.98	9.90	31.74	39.37	82.99	**+20.15**
'11	2.04	13.64	27.65	35.16	78.49	**+15.65**
'12	3.74	9.13	30.19	10.76	53.82	− 9.02
'13	7.56	13.80	32.43	*8.90*	62.69	− 0.15
'14	2.25	14.94	*9.86*	16.00	43.05	−19.79
1915	**17.86**	10.69	(20.00)	(20.00)	68.45	**+ 5.61**
'16	0.24	7.02	30.71	25.47	63.44	**+ 0.60**
'17	1.10	11.02	21.96	24.88	58.96	− 3.88
'18	1.98	15.47	20.70	11.60	49.70	−13.14
'19	8.20	9.82	30.54	17.68	66.24	**+ 3.40**
1920	2.75	11.50	22.29	35.42	71.96	**+ 9.12**
'21	4.78	14.39	27.85	22.79	69.81	**+ 6.97**
'22	2.05	12.54	22.28	20.87	57.74	− 5.10
'23	4.50	13.70	22.18	13.35	53.73	− 9.11
'24	5.88	10.68	18.70	29.90	65.16	**+ 3.32**
Means	5.08	12.16	24.14	21.46	62.84	....

(b) (Province of Havana.)

Year	Winter	Spring	Summer	Fall	Year (Dec.–Nov.)	Departure*
1899	....	....	10.51	13.30	....	....
1900	6.49	15.00	15.82	10.40	47.71	− 9.02
'01	6.65	10.35	19.75	11.97	48.72	− 8.01
'02	5.71	3.56	17.32	15.67	42.26	−14.47
'03	8.13	8.36	24.00	14.82	55.31	− 1.42
'04	7.50	18.20	18.03	*10.03*	53.98	− 2.75
1905	2.31	13.74	*10.51*	13.20	39.76	−16.97
'06	14.25	15.72	24.19	19.63	73.79	**+17.06**
'07	1.86	*2.45*	13.13	10.16	*27.60*	−29.13
'08	5.24	4.86	26.96	14.43	51.49	− 5.24
'09	6.57	9.73	23.70	22.16	62.15	**+ 5.42**
1910	3.03	4.91	22.38	**32.76**	63.08	**+ 6.35**
'11	1.96	16.22	23.82	22.64	64.62	**+ 7.89**
'12	6.38	14.10	**31.49**	19.65	71.62	**+14.89**
'13	7.65	15.33	30.18	22.32	**75.98**	**+19.25**
'14	9.68	**23.20**	15.35	23.96	72.19	**+15.46**
1915	**22.58**	12.48	16.95	18.72	70.73	**+14.00**
'16	*1.06*	9.50	25.46	16.51	52.53	− 4.20
'17	1.58	6.07	14.68	18.18	40.51	−16.22
'18	3.62	14.27	16.58	16.15	50.62	− 6.11
'19	9.40	10.83	25.03	17.44	62.70	**+ 5.97**
1920	4.02	8.34	20.38	26.04	58.77	**+ 2.04**
'21	4.39	12.94	25.62	12.93	56.78	**+ 0.05**
'22	5.89	15.02	21.76	28.18	70.85	**+14.12**
'23	2.29	15.56	20.38	14.27	52.50	− 4.23
'24	9.93	10.24	21.87	27.41	69.45	**+12.72**
Means	6.33	11.64	20.45	18.31	56.73	....

* Plus departures in bold-face type. NOTE: Maximum values in bold-face type; minimum values in italics.

TABLE IV.—SEASONAL AND ANNUAL RAINFALL, BY PROVINCES, WITH DEPARTURES FROM THE NORMAL FOR THE YEAR.

PRECIPITACIÓN POR PROVINCIAS, ANUAL Y POR ESTACIONES, CON DESVIACIONES DE LA NORMAL PARA EL AÑO.

(c) (Province of Matanzas.)

Year	Winter	Spring	Summer	Fall	Year (Dec.–Nov.)	Departure*
1899	....	....	*13.12*	12.44	....	....
1900	4.70	15.47	18.48	12.76	51.41	— 7.37
'01	3.44	18.52	22.01	15.27	59.24	+ **0.46**
'02	5.90	6.22	30.03	13.27	55.42	— 3.36
'03	7.31	6.62	27.98	19.65	61.56	+ **2.78**
'04	5.40	**23.82**	23.63	13.99	66.84	+ **8.06**
1905	2.35	19.23	17.71	*7.96*	47.25	— 11.53
'06	**16.20**	17.39	31.34	19.44	84.37	+ **25.59**
'07	1.53	*5.21*	23.15	11.59	*41.48*	— 17.30
'08	6.65	6.35	26.27	17.60	56.87	— 1.91
'09	4.72	15.22	**43.94**	27.01	**90.89**	+ **32.11**
1910	1.67	11.13	22.51	**30.14**	65.45	+ **6.67**
'11	2.90	15.12	29.77	19.51	67.30	+ **8.52**
'12	5.57	9.72	31.79	14.77	61.85	+ **3.07**
'13	4.44	12.02	29.18	21.51	67.15	+ **8.37**
'14	5.50	11.06	13.46	16.14	46.16	— 12.62
1915	12.15	8.97	19.43	19.32	59.87	+ **1.09**
'16	9.98	8.18	18.52	14.66	51.34	— 7.44
'17	*1.30*	8.68	22.11	12.00	44.09	— 14.69
'18	1.94	11.53	17.90	17.94	49.31	— 9.47
'19	8.21	13.50	21.76	18.74	61.71	+ **2.93**
1920	5.88	14.87	21.89	20.06	62.70	+ **3.92**
'21	4.12	15.14	29.11	16.50	64.87	+ **6.09**
'22	1.98	9.64	23.13	23.52	58.27	— 0.51
'23	2.86	17.47	19.74	15.40	55.47	— 3.31
'24	4.71	8.98	22.90	17.58	54.17	— 4.61
Means	5.26	12.40	23.88	17.24	58.78	....

(d) (Province of Santa Clara.)

Year	Winter	Spring	Summer	Fall	Year (Dec.–Nov.)	Departure*
1899	....	....	16.14	20.62	....	....
1900	3.52	11.07	16.52	16.26	47.37	— 8.21
'01	5.03	8.81	23.58	18.30	55.72	+ **0.14**
'02	4.99	6.79	18.12	14.32	44.22	— 11.36
'03	**10.56**	6.43	19.85	14.68	51.52	— 4.06
'04	4.11	**20.04**	20.83	19.84	64.82	+ **9.24**
1905	2.35	16.27	16.30	*12.24*	47.16	— 8.42
'06	9.57	12.01	**39.52**	22.72	**83.82**	+ **28.24**
'07	2.28	*4.05*	23.85	12.62	*42.80*	— 12.78
'08	7.48	5.60	20.24	20.12	53.44	— 2.14
'09	6.22	10.92	25.16	20.30	62.60	+ **7.02**
1910	4.25	4.90	21.81	21.89	53.85	— 1.73
'11	2.55	13.86	20.04	17.88	54.33	— 1.25
'12	5.99	12.31	22.45	13.93	54.69	— 0.89
'13	3.86	10.53	17.46	16.76	48.61	— 6.97
'14	5.65	15.27	14.35	25.60	60.88	+ **5.30**
1915	7.76	13.70	24.98	18.62	65.06	+ **9.48**
'16	1.66	9.62	20.69	**26.92**	58.91	+ **3.33**
'17	2.56	11.68	17.09	15.38	46.71	— 8.87
'18	4.34	14.19	*13.60*	18.32	50.45	— 5.13
'19	8.59	12.11	17.50	17.31	55.51	— 0.07
1920	4.12	13.05	23.67	22.65	63.49	+ **7.91**
'21	4.22	15.41	22.71	21.32	63.66	+ **8.08**
'22	2.52	16.98	23.72	23.58	66.80	+ **11.22**
'23	*1.38*	14.88	20.11	13.06	49.43	— 6.15
'24	5.44	9.06	18.97	23.55	57.02	+ **1.44**
Means	4.84	11.18	20.76	18.80	55.58	....

NOTE: Maximum values in bold-face type; minimum values in italics. * Plus departures in bold-face type.

TABLE IV.—SEASONAL AND ANNUAL RAINFALL, BY PROVINCES, WITH DEPARTURES FROM THE NORMAL FOR THE YEAR.

PRECIPITACIÓN POR PROVINCIAS, ANUAL Y POR ESTACIONES, CON DESVIACIONES DE LA NORMAL PARA EL AÑO.

(e) (Province of Camaguey.)

Year	Winter	Spring	Summer	Fall	Year (Dec.–Nov.)	Departure*
1899	....	....	14.36	21.17	....	....
1900	9.44	21.01	11.60	20.00	62.05	+ **8.26**
'01	3.14	8.44	23.64	15.70	50.92	— 2.87
'02	3.77	*6.39*	25.96	17.66	53.78	— 0.01
'03	**9.67**	11.91	23.87	20.78	66.23	+ **12.44**
'04	6.69	**25.59**	22.02	16.33	70.63	+ **16.84**
1905	3.51	17.75	**34.19**	15.91	**71.36**	+ **17.57**
'06	3.20	19.55	21.31	12.80	56.86	+ **2.07**
'07	*0.78*	6.48	19.51	11.61	*38.38*	— 15.41
'08	3.92	11.18	18.36	15.45	48.91	— 4.88
'09	5.88	11.55	20.18	19.52	57.13	+ **3.34**
1910	1.97	6.50	17.20	12.79	38.46	— 15.33
'11	1.69	9.13	15.25	13.70	39.77	— 14.02
'12	4.42	10.13	20.23	15.99	50.78	— 3.01
'13	5.58	12.76	17.14	12.81	48.29	— 5.50
'14	4.75	6.58	*7.88*	22.35	41.56	— 12.23
1915	6.14	17.47	17.68	14.13	55.42	+ **1.63**
'16	2.57	12.42	16.26	**34.28**	65.52	+ **11.73**
'17	1.89	13.56	16.26	18.42	50.13	— 3.66
'18	4.95	12.22	19.57	*9.78*	46.52	— 7.27
'19	9.63	13.70	23.53	11.96	58.82	+ **5.03**
1920	5.11	12.11	17.79	22.52	57.53	+ **3.74**
'21	2.95	16.40	17.24	10.90	47.49	— 6.30
'22	3.48	14.43	19.68	16.79	54.38	+ **0.59**
'23	1.55	17.38	20.13	18.59	57.65	+ **3.86**
'24	5.86	10.01	16.56	25.63	58.06	+ **4.27**
Means	4.50	12.95	19.13	17.21	53.87	....

(f) (Province of Oriente.)

Year	Winter	Spring	Summer	Fall	Year (Dec.–Nov.)	Departure*
1899	....	....	9.71	**34.76**	....	....
1900	6.30	10.14	10.90	24.22	51.56	+ **5.59**
'01	4.35	7.43	**20.70**	20.91	53.39	+ **7.42**
'02	5.23	12.17	11.73	16.04	45.17	— 0.80
'03	5.33	13.35	14.04	20.89	53.61	+ **7.64**
'04	5.91	15.07	14.05	13.42	48.44	+ **2.47**
1905	5.64	13.53	15.00	14.99	49.16	+ **3.19**
'06	5.33	12.44	19.27	24.66	61.70	+ **15.73**
'07	*1.77*	*5.81*	10.65	14.91	*33.14*	— 12.83
'08	7.56	12.49	18.30	23.27	**61.62**	+ **15.65**
'09	5.79	9.23	12.87	16.42	44.31	— 1.66
1910	3.30	7.50	7.32	16.06	34.18	— 11.79
'11	6.34	11.36	7.72	10.75	36.17	— 9.80
'12	10.15	6.62	8.39	24.85	50.01	+ **4.04**
'13	6.91	8.31	7.01	13.41	35.64	— 10.33
'14	**14.32**	7.49	*3.59*	18.87	44.27	— 1.70
1915	7.22	10.27	7.34	12.00	36.83	— 9.14
'16	7.41	13.10	12.21	21.38	54.10	+ **8.13**
'17	2.80	**17.59**	9.31	13.70	43.40	— 2.57
'18	6.45	13.16	11.67	10.18	41.46	— 4.51
'19	10.27	7.88	7.80	*8.17*	34.12	— 11.85
1920	6.50	9.25	9.50	18.02	43.27	— 2.70
'21	7.35	17.43	14.59	11.11	50.48	+ **4.51**
'22	4.41	7.33	9.89	13.31	34.94	— 11.03
'23	3.03	9.02	8.70	18.92	39.67	— 6.30
'24	4.03	7.57	11.17	30.35	53.12	+ **7.15**
Means	6.15	10.62	11.29	17.91	45.97	....

NOTE: Maximum values in bold-face type; minimum values in italics. * Plus departures in bold-face type.

TABLE V.—NORMAL MONTHLY AND ANNUAL RAINFALL AT 19 STATIONS.

PRECIPITACIÓN NORMAL, MENSUAL Y ANUAL DE 19 ESTACIONES.

Stations	Number of Years	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
Pinar del Río	25	1.82	1.74	2.48	2.62	6.97	10.29	6.61	7.01	10.65	7.74	2.46	1.39	61.78
Havana	25	2.98	1.33	1.78	*1.58*	4.71	5.26	4.33	4.27	5.18	6.21	3.20	2.17	*43.00*
Batabanó	25	2.42	2.07	2.53	2.69	7.92	8.13	6.41	**8.95**	**11.77**	8.46	2.62	1.28	65.25
Santa Bárbara	13	1.47	2.16	2.40	**3.93**	8.63	11.96	7.58	7.67	11.06	**9.93**	2.30	1.59	**70.68**
Aguacate	25	2.18	1.85	2.46	2.63	7.75	9.88	7.88	6.37	8.84	6.05	2.84	2.12	60.85
Matanzas	17	2.52	1.36	2.32	2.37	5.94	9.32	4.50	5.40	5.75	6.10	2.61	3.32	51.51
Banaguises	21	1.17	1.79	2.48	2.84	6.45	9.36	7.02	7.30	9.02	*5.32*	2.28	1.58	56.61
Unión de Reyes	21	0.97	1.86	**3.07**	2.96	**10.17**	**12.21**	**8.35**	8.82	10.48	8.16	2.16	1.42	70.63
Cruces	21	1.38	1.65	2.06	3.03	6.69	8.89	5.98	7.58	9.04	6.11	2.32	2.06	56.79
Camajuani	21	2.05	1.12	1.47	2.93	6.41	9.33	5.24	5.44	6.39	7.13	4.90	2.83	55.24
Yaguajay	18	2.05	1.43	2.18	3.09	6.01	8.89	4.60	6.11	7.95	6.88	5.25	2.20	56.64
Cienfuegos	25	1.26	1.44	1.87	2.29	6.44	7.63	6.18	6.48	8.04	7.32	*2.14*	1.25	52.34
Ciego de Avila	16	1.03	1.19	1.26	1.96	5.44	9.41	5.28	5.21	7.87	6.20	2.58	*0.56*	47.99
La Gloria	17	2.72	1.30	1.64	3.63	7.97	5.84	3.73	3.51	6.40	7.37	5.79	2.38	52.28
Camaguey	20	1.54	1.40	2.43	3.64	7.62	10.52	5.60	5.54	7.26	5.44	3.12	1.96	56.07
Manzanillo (Gibara)	14	*0.60*	*0.84*	2.15	2.98	7.48	9.06	5.67	5.79	8.08	6.83	2.55	1.25	53.28
Santa Lucía	20	2.96	1.42	1.40	2.07	6.08	3.73	1.74	2.75	4.47	7.21	7.95	3.18	44.96
Preston (Nipe Bay)	17	**4.03**	**2.21**	*1.25*	2.88	*4.65*	*2.36*	*1.50*	*2.08*	*3.88*	6.42	**8.21**	**5.31**	44.81
Santiago	21	1.47	0.87	1.72	3.32	6.45	5.39	2.26	3.58	6.66	7.40	3.61	1.06	43.79
Means	20	1.93	*1.53*	2.05	2.81	6.83	**8.29**	5.29	5.79	7.82	6.96	3.62	2.05	54.97

NOTE: Maximum values in bold-face type; minimum values in italics.

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TABLE VI.—MAXIMUM AND MINIMUM MONTHLY RAINFALL AT 19 STATIONS (1899–1924).

PRECIPITACION MAXIMA Y MINIMA MENSUAL DE 19 ESTACIONES.

Stations	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
Aguacate, Havana	6.36	6.70	**9.85**	8.54	19.33	21.45	12.61	14.40	15.16	18.84	8.54	14.99	96.76
	0	0	0.06	0.28	1.75	2.56	2.29	0.74	1.92	2.16	0.15	0.15	43.86
Banaguise, Matanzas	3.22	6.30	7.60	8.20	15.37	21.35	13.79	16.73	17.15	17.27	7.10	8.65	82.83
	0	0	0.10	0	0	2.93	2.30	2.31	4.42	1.42	0	0	39.44
Batabanó, Havana	**16.70**	**11.30**	7.40	**19.20**	22.60	23.90	14.90	**17.66**	21.88	25.80	15.00	9.00	**117.10**
	0	0	0	0	0	**0.12**	1.50	2.33	1.90	0.66	0	0	17.14
Camaguey, Camaguey	4.40	5.00	7.59	(10.00)	16.53	17.45	12.52	12.65	15.37	11.54	12.72	6.69	71.84
	0.20	0	0	0.24	0.94	4.61	1.66	0.91	1.82	0.66	0	0	36.02
Camajuani, Sta. Clara	4.41	2.50	4.45	7.89	12.88	20.12	11.65	9.00	11.34	13.57	18.24	9.97	65.80
	0.23	0.17	0.13	0.35	1.10	5.71	1.81	0.36	1.88	2.03	0.26	0.22	34.02
Ciego de Avila, Camaguey	3.66	2.66	3.79	4.62	9.02	18.34	9.41	10.06	16.30	11.40	4.90	1.92	65.62
	0	0	0	0.15	0.86	2.80	1.00	1.50	3.50	1.85	0.10	0	35.01
Cienfuegos, Sta. Clara	3.63	3.60	4.19	8.31	14.48	26.58	9.70	11.27	14.43	13.79	10.83	6.55	85.85
	0	0	0	0	0.32	1.98	2.67	2.40	3.25	1.90	0	0	33.01
Cruzes, Sta. Clara	4.65	4.03	6.00	7.52	15.67	**34.41**	10.55	16.55	17.00	16.38	8.83	8.14	89.01
	0	0	0	0.23	0.82	1.73	2.76	3.86	2.32	0.66	0	0	37.62
La Gloria, Camaguey	6.84	3.55	4.46	12.36	14.45	10.76	8.15	7.00	21.91	15.64	15.31	6.34	75.71
	0.30	0.20	0.25	0.20	0.97	1.95	1.33	0.36	0.76	2.39	0.48	0	37.14
Havana, Havana	13.12	3.39	5.12	4.56	13.13	12.03	9.09	9.76	11.35	21.34	10.36	11.07	55.91
	0.12	0	0	0	0.38	0.85	0.89	**0.14**	0.69	**0.33**	0.51	0.12	25.34

NOTE: Extreme values in bold-face type.

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TABLE VI.—(*Continued.*)

Stations	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
Manzanillo, Oriente	1.97	2.96	9.15	15.00	17.24	20.50	10.22	11.71	14.80	18.09	11.30	4.60	83.19
	0	0	0	0	1.73	1.24	1.51	1.50	2.30	0.83	0	0	24.82
Matanzas, Matanzas	7.81	3.81	8.77	6.42	20.27	18.30	7.94	11.06	8.74	22.92	10.55	**18.70**	73.73
	0.05	0	0.12	0	0.06	0.13	1.05	0.69	1.81	1.68	0	0.09	**16.48**
Pinar del Río, P. del Río	7.44	4.72	7.94	6.66	15.24	23.73	12.12	14.36	24.51	**27.00**	21.58	7.47	84.73
	0	0	0.16	0.12	1.97	2.80	3.35	2.06	0.99	1.44	0.24	0	39.78
Preston, Oriente	12.67	5.59	3.79	11.11	10.56	6.65	6.65	8.60	10.75	12.80	**23.54**	15.90	56.39
	0.26	0.61	0	0.08	0.42	0.31	**0.04**	0.22	**0.48**	1.11	2.10	0.50	31.49
Santa Bárbara, Isle of Pines	4.44	8.34	4.29	8.89	16.87	20.13	14.40	12.85	15.99	26.34	11.22	5.05	84.61
	0	0	0	0.60	2.57	6.03	3.18	4.13	4.46	2.95	0	0	40.56
Santa Lucía, Oriente	6.89	2.87	5.58	6.20	12.20	8.98	6.35	5.59	11.37	18.25	21.68	7.85	63.74
	1.00	0.28	0	0.20	1.85	0.24	0.20	0.57	0.73	1.20	1.96	0	28.45
Santiago, Oriente	4.00	2.63	3.57	10.91	12.00	15.37	9.82	8.66	**29.49**	19.06	11.80	2.99	66.86
	0.04	0	0	6	0.05	0.43	0.06	0.22	1.40	2.72	0.41	0	21.75
Unión de Reyes, Matanzas	5.12	5.11	9.62	8.06	**24.50**	24.94	**19.70**	16.50	24.56	21.51	12.01	(10.00)	116.94
	0	0	0.33	0	5.45	4.56	3.58	1.67	3.82	2.95	0	0	50.00
Yaguajay, Sta. Clara	5.91	3.77	4.55	9.95	12.06	22.85	13.97	11.49	15.55	12.25	16.65	8.02	75.61
	0	0.12	0	0.22	0.97	2.10	0.47	1.15	2.30	0.51	0	0	46.95
Extremes for Entire Island	16.70	11.30	9.85	19.20	24.50	34.41	19.70	17.66	29.49	27.00	23.54	18.70	117.10
	0	0	0	0	0	0.12	0.04	0.14	0.48	0.33	0	0	16.48

NOTE: Extreme values in bold-face type.

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TABLE VII.—ANNUAL RAINFALL (1900–1924).

PRECIPITACIÓN ANUAL DE 19 ESTACIONES, 1900 A 1924.

Stations	1900	1901	1902	1903	1904	1905	1906	1907	1908	1909	1910	1911	1912
Pinar del Rio	52.04	80.47	61.27	59.70	54.50	58.28	81.37	39.78	63.28	84.73	82.55	78.61	54.52
Havana	38.92	55.91	41.55	46.96	39.56	36.32	52.46	27.05	49.14	52.50	46.94	41.76	46.81
Batabanó	47.76	30.83	38.90	61.19	59.56	43.75	39.95	17.04	38.36	57.50	67.00	78.10	117.10
Aguacate	57.96	57.65	47.89	65.86	56.31	67.44	96.76	43.86	64.87	77.39	72.64	66.81	51.85
Santa Bárbara	....	....	....	....	....	....	....	....	....	....	69.29	68.01	71.71
Matanzas	45.76	60.09	48.18	57.01	55.08	45.72	67.06	31.03	53.15	73.73	45.60	58.36	47.14
Banaguises	55.07	64.11	51.46	67.18	63.62	59.19	72.55	47.76	56.37	82.83	68.98	61.89	53.37
Unión de Reyes	55.12	56.62	56.73	63.61	77.13	70.22	77.00	51.37	57.37	116.94	87.21	75.78	93.04
Cruces	48.28	47.96	49.29	44.58	68.15	52.14	89.01	37.62	53.35	67.81	60.44	52.94	62.45
Camajuani (Fé)	54.68	60.97	47.49	57.03	61.24	59.04	63.16	43.34	60.50	65.80	50.37	56.89	58.79
Yaguajay	....	66.40	47.47	55.90	54.50	51.07	69.38	52.71	53.13	60.50	49.66	48.86	50.03
Cienfuegos	43.33	49.17	46.31	36.32	66.53	53.50	85.85	48.38	39.22	63.41	47.22	57.00	52.56
Ciego de Avila	....	46.18	47.63	54.17	....	....	....	...	46.55	55.59	38.40	35.01	44.30
La Gloria	....	....	....	....	....	....	....	....	55.07	52.38	37.14	45.13	59.33
Camaguey	61.82	54.63	63.28	75.94	66.80	71.84	51.78	39.97	44.59	62.15	41.50	36.02	51.47
Manzanillo	51.48	48.70	59.18	54.57	53.57	48.86	63.83	43.97	83.19	24.82	36.15	42.53	....
Preston	....	....	....	....	....	....	....	....	47.58	47.36	52.01	40.03	50.37
Santa Lucia	39.69	60.82	39.87	63.74	48.21	36.67	51.33	28.45	56.81	44.61	42.48	38.47	46.65
Santiago	59.94	57.59	35.12	46.57	40.87	56.09	66.86	34.32	57.38	55.80	21.75	29.92	41.00
Means	50.85	56.13	48.85	56.90	57.71	54.01	68.56	39.11	54.44	63.66	53.54	53.08	58.47
Departures	−4.28	**+1.00**	−6.28	**+1.77**	**+2.54**	−1.12	**+13.45**	−16.01	−0.69	**+8.53**	−1.59	−2.05	**+3.34**

NOTE: Plus departures in bold-face type.

TABLE VII.—(*Continued*).

Stations	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	Means
Pinar del Rio	70.92	50.27	83.41	63.39	63.51	52.03	64.92	73.56	63.05	58.64	42.92	51.25	61.78
Havana	49.25	41.62	42.94	31.97	26.93	25.34	41.75	48.52	32.19	43.35	48.49	71.13	43.00
Batabanó	114.10	100.08	....	72.98	58.46	49.90	74.06	56.60	78.84	88.20	72.60	92.72	65.25
Aguacate	59.92	59.87	63.18	48.98	48.67	48.19	55.10	61.47	59.50	75.64	45.62	70.10	60.85
Santa Bárbara	76.60	84.61	....	54.41	70.28	81.69	63.24	73.29	70.09	81.88	40.56	....	70.68
Matanzas	40.48	56.60	56.73	40.30	....	....	....	....	....	....	....	....	51.51
Banaguises	49.35	44.42	....	44.53	39.44	42.09	60.27	68.76	....	....	....	....	56.61
Unión de Reyes	111.62	....	....	....	50.00	58.33	60.77	61.96	63.70	72.35	69.61	....	70.63
Cruces	42.19	64.71	....	55.48	41.72	58.71	57.34	81.20	....	....	....	....	56.79
Camajuani (Fé)	34.02	60.89	62.24	59.86	52.39	41.93	55.42	60.39	....	....	....	....	55.24
Yaguajay	56.70	56.64	....	75.61	46.95	....	....	....	....	....	....	....	56.64
Cienfuegos	54.45	68.15	....	42.62	47.68	55.72	44.28	58.64	51.30	52.60	33.01	50.72	52.34
Ciego de Avila	46.85	37.05	....	55.11	47.17	49.32	51.96	65.62	....	....	....	....	47.99
La Gloria	44.68	47.26	60.65	75.71	55.12	37.60	50.59	50.23	49.90	45.70	46.52	72.68	52.28
Camaguey	55.12	....	....	....	54.60	49.40	71.69	61.01	45.85	....	....	....	56.07
Manzanillo	....	....	....	....	52.70	63.14	....	....	45.57	37.53	45.07	....	50.91
Preston	52.42	49.98	37.92	46.07	56.39	31.81	37.16	40.84	50.20	31.49	33.97	59.31	44.81
Santa Lucia	33.22	39.58	57.69	47.18	....	....	....	....	....	28.58	51.23	63.13	44.96
Santiago	35.65	30.04	31.08	63.77	31.70	29.50	29.48	....	49.40	....	....	....	43.79
Means	57.14	55.74	55.49	54.87	49.63	48.42	54.54	61.58	54.97	56.00	48.15	66.38	55.13
Departures	**+2.01**	**+0.61**	**+0.36**	−0.26	−5.50	−6.71	−0.59	**+6.45**	−0.16	**+0.87**	−6.98	**+11.25**	

NOTE: Plus departures in bold-face type.

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TABLE VIII (a).

NORMAL SEASONAL RAINFALL AT 19 STATIONS

PRECIPITACIÓN NORMAL POR ESTACIONES.

Stations	Years	Winter	Spring	Summer	Autumn	Year (Dec.–Nov.)
Pinar del Río	25	4.95	12.07	23.91	20.85	61.78
Havana	25	6.48	*8.07*	13.86	14.59	*43.00*
Batabanó	25	5.77	13.14	23.49	22.85	65.25
Santa Bárbara	13	5.22	14.96	27.21	**23.29**	**70.68**
Aguacate	25	6.15	12.84	24.19	17.73	60.91
Matanzas	17	7.20	10.63	19.22	*14.46*	50.51
Banaguises	21	4.54	11.77	23.68	16.62	56.61
Unión de Reyes	21	4.25	**16.20**	**29.38**	20.80	70.63
Cruces	21	5.09	11.78	22.45	17.47	56.79
Camajuani	21	6.06	10.81	20.01	18.42	55.30
Yaguajay	18	5.68	11.28	19.60	20.08	56.64
Cienfuegos	25	3.95	10.60	20.29	17.50	52.34
Ciego de Avila	16	2.78	8.66	19.90	16.65	47.99
La Gloria	17	6.40	13.24	13.08	19.56	52.28
Camaguey	20	4.90	13.69	21.66	15.82	56.07
Manzanillo	14	*2.69*	12.61	20.52	17.46	53.28
Santa Lucía (Gibara)	20	7.69	9.55	8.22	19.63	45.09
Preston (Nipe Bay)	17	**11.70**	8.78	*6.00*	18.51	44.99
Santiago	21	3.40	11.49	11.23	17.67	43.79
Means	20	*5.52*	11.69	**19.36**	18.42	54.99

NOTE: Maximum values in bold-face type; minimum values in italics.

TABLE VIII (b).

NORMAL SEASONAL RAINFALL BY PROVINCES.

PRECIPITACIÓN NORMAL POR PROVINCIAS.

Provinces	Years	Winter	Spring	Summer	Autumn	Year (Dec.–Nov.)
Pinar del Río	25	5.08	12.16	24.14	21.46	62.94
Havana	25	6.33	11.64	20.45	18.31	56.73
Matanzas	25	5.26	12.40	23.88	17.24	58.78
Santa Clara	25	4.84	11.18	20.76	18.80	55.58
Camaguey	25	4.50	12.95	19.13	17.21	53.79
Oriente	25	6.15	10.62	11.29	17.91	45.27
Means	25	5.36	11.82	19.94	18.49	55.51

TABLE IX.—RATIOS OF MAXIMUM TO MINIMUM SEASONAL AND ANNUAL RAINFALL.

RELACIÓN ENTRE LLUVIA MÁXIMA Y MINIMA; ANUAL Y POR ESTACIONES.

Provinces		Winter Dec.–Feb.	Spring Mar.–May	Summer June–Aug.	Autumn Sept.–Nov.	Year Dec.–Nov.
Pinar del Río	Max.	17.86	22.71	36.62	44.48	89.04
	Min.	0.94	2.75	9.86	8.90	37.22
	Ratio	*19.0*	*8.3*	*3.7*	*5.0*	*2.4*
Havana	Max.	22.58	23.20	31.49	32.76	75.98
	Min.	1.58	2.45	10.51	10.03	27.60
	Ratio	*14.3*	*9.4*	*3.0*	*3.3*	*2.8*
Matanzas	Max.	16.20	23.82	43.94	30.14	90.89
	Min.	1.30	5.21	13.12	7.96	41.48
	Ratio	*12.5*	*4.6*	*3.3*	*3.8*	*2.2*
Santa Clara	Max.	10.56	20.04	39.52	26.92	83.82
	Min.	1.38	4.05	13.60	12.24	42.80
	Ratio	*7.6*	*4.9*	*2.9*	*2.2*	*2.0*
Camaguey	Max.	9.67	25.59	34.19	34.28	71.36
	Min.	0.78	6.39	7.88	9.78	38.38
	Ratio	*12.4*	*4.0*	*4.3*	*3.5*	*1.9*
Oriente	Max.	14.32	17.59	20.70	34.76	61.62
	Min.	1.77	5.81	3.59	8.17	33.14
	Ratio	*8.1*	*3.0*	*5.8*	*4.3*	*1.9*
Mean Ratio for the Provinces		12.3	5.7	3.8	3.7	2.2

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TABLE X.—NORMAL MONTHLY AND ANNUAL TEMPERATURES AT 10 STATIONS.

TEMPERATURA NORMAL, MENSUAL Y ANUAL, DE 10 ESTACIONES.

(Degrees Fahrenheit.)

Stations	Number of Years	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
Pinar del Río	19	71.4	72.1	74.8	76.8	80.8	81.3	82.8	82.8	81.7	79.5	75.0	72.3	77.6
Havana	24	70.6	70.8	72.8	75.1	77.5	79.2	80.2	80.4	79.8	77.8	74.2	71.9	75.8
Aguacate	20	68.9	70.3	72.5	74.3	77.4	78.6	79.7	80.1	79.2	77.4	72.1	69.8	74.9
Matanzas	16	70.5	69.3	71.9	74.5	77.5	79.3	80.8	81.3	80.4	78.1	73.8	71.2	75.7
Banaguises	20	72.1	72.7	75.4	77.4	79.0	80.4	80.8	81.0	79.9	79.2	75.2	73.2	77.4
Cienfuegos	19	69.5	70.3	72.9	75.2	77.7	78.7	79.7	79.6	78.3	77.3	72.5	71.2	75.2
Camajuani	19	67.4	68.5	70.6	72.8	75.5	77.0	77.5	77.8	76.7	75.3	71.2	69.1	73.3
Camaguey	17	71.8	73.7	76.1	77.6	79.6	80.5	81.7	82.0	80.6	78.9	75.4	73.2	77.6
Guantánamo	13	73.6	74.3	74.8	76.3	77.7	79.2	80.2	79.5	79.9	78.6	77.2	74.3	77.2
Santiago	16	75.0	75.0	77.0	78.1	79.9	81.0	81.9	82.2	81.3	80.1	78.1	76.8	78.8
Normals	18	71.1	71.7	73.9	75.8	78.3	79.5	80.5	80.7	79.8	78.2	74.5	73.3	76.4

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TABLE XI.—HIGHEST AND LOWEST MEAN MONTHLY AND ANNUAL TEMPERATURES AT 10 STATIONS (1900 TO 1919).

TEMPERATURA MAXIMA Y MINIMA MEDIA MENSUAL DE 10 ESTACIONES.

(Degrees Fahrenheit.)

Stations	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
Pinar del Río	76.1	75.9	79.9	80.2	84.0	**83.8**	84.9	85.3	84.2	**83.8**	79.5	74.8	80.1
	66.2	67.6	71.4	73.9	77.0	78.4	81.1	80.6	79.9	76.1	70.9	69.3	75.7
Havana	73.4	75.0	76.1	78.8	80.2	81.1	82.8	82.9	82.0	80.4	78.1	74.1	77.0
	66.9	68.2	68.9	72.1	75.0	77.9	78.4	78.4	77.7	75.9	71.1	68.0	74.5
Aguacate	75.9	76.6	78.8	79.2	79.3	82.0	83.1	83.8	82.6	80.4	76.6	76.3	78.1
	64.8	65.3	67.6	69.6	75.4	76.1	77.4	76.8	75.9	73.9	69.1	65.3	73.0
Matanzas	75.7	73.0	76.6	80.4	80.2	81.7	84.2	83.3	82.4	79.3	78.3	74.5	77.0
	66.9	66.4	68.2	70.7	75.6	78.4	79.0	79.3	79.0	77.0	70.0	66.7	74.3
Banaguises	79.2	79.3	79.9	81.7	81.5	82.8	83.1	83.3	82.2	82.4	81.0	78.4	79.0
	67.3	67.6	68.4	73.4	75.2	77.0	78.1	78.3	77.7	77.0	70.7	68.4	74.8
Cienfuegos	72.0	74.7	76.6	79.0	81.3	82.0	82.0	82.0	80.4	83.7	79.3	77.3	76.3
	66.0	66.0	69.8	70.0	72.0	73.0	*73.9*	75.0	73.9	*72.0*	67.8	67.5	71.4
Camajuani	73.2	74.7	76.8	77.0	79.0	82.2	80.6	81.1	80.2	78.1	75.0	73.4	77.0
	62.6	*63.7*	*65.5*	*69.4*	*70.2*	*70.5*	75.0	*73.6*	*72.7*	*72.0*	*65.7*	*64.8*	*70.7*
Camaguey	75.6	77.0	78.8	**82.4**	82.2	83.5	**85.3**	**85.6**	83.8	83.5	78.8	77.7	79.2
	68.2	71.1	72.7	71.8	75.6	77.2	79.9	79.0	76.5	76.5	69.8	67.5	76.3
Guantánamo	75.0	76.6	77.4	78.1	80.6	81.7	83.5	83.5	83.5	81.7	80.1	77.0	79.3
	72.0	71.1	68.0	73.9	75.6	75.0	76.5	75.0	75.9	73.0	73.0	69.1	75.0
Santiago	**79.7**	**82.4**	**83.1**	81.0	**82.8**	83.5	84.9	84.6	**85.3**	83.3	**80.2**	**80.2**	**80.2**
	71.6	68.0	74.5	75.4	77.4	78.6	80.2	79.5	77.7	76.6	75.6	74.7	76.8
Extreme Range	17.1	18.7	17.6	13.0	12.6	13.3	11.4	12.0	12.6	11.8	14.5	15.4	9.5

NOTE: Maximum values in bold-face type; minimum values in italics.

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TABLE XII.—MEAN MONTHLY AND ANNUAL TEMPERATURE, AT HAVANA (F.°), 1900–1924.

TEMPERATURA MEDIA MENSUAL Y ANUAL DE LA HABANA DE 1900 A 1924.

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1900	69.1	70.9	72.1	75.7	77.5	79.9	80.1	81.0	80.4	79.5	74.7	74.1	76.3
'01	70.2	71.4	72.3	**72.1**	75.9	80.1	80.4	80.9	80.4	78.6	71.6	70.2	75.4
'02	66.9	68.9	73.0	74.5	78.1	79.9	81.0	81.9	81.1	79.7	75.7	72.7	76.1
'03	72.5	**75.0**	74.1	73.8	**75.0**	79.3	80.2	79.7	79.9	76.6	72.9	69.1	75.7
'04	70.5	71.4	73.4	75.2	76.3	78.1	**78.4**	**78.4**	79.0	76.6	73.0	71.8	75.2
1905	**66.9**	71.4	72.5	73.9	78.6	80.1	80.6	80.6	80.1	79.2	75.7	72.7	76.1
'06	70.9	70.3	72.0	73.6	77.0	78.3	79.7	79.0	**82.0**	76.6	75.0	70.2	75.4
'07	71.2	69.4	72.9	74.7	78.6	78.8	79.5	79.5	79.3	76.8	74.7	71.8	75.6
'08	68.9	69.1	73.6	77.7	78.8	79.5	78.8	**78.4**	78.6	**75.9**	73.4	72.0	75.4
'09	70.0	70.0	72.1	73.8	77.2	78.3	79.0	78.8	**77.7**	76.6	73.8	70.7	75.2
1910	68.5	69.1	70.3	73.8	77.7	79.0	80.8	79.9	79.0	76.5	71.4	68.7	**74.5**
'11	71.2	70.3	73.0	75.6	77.0	79.3	80.4	81.1	81.0	**80.4**	77.5	73.6	76.1
'12	72.5	69.6	75.4	**78.8**	**80.2**	79.5	81.3	81.0	80.8	78.6	74.5	**74.1**	**77.0**
'13	73.2	73.9	**75.9**	74.5	76.5	**77.9**	80.8	80.2	79.2	77.5	73.6	72.1	76.3
'14	70.9	71.8	70.0	75.9	77.7	80.6	81.9	82.2	80.4	76.6	74.3	73.8	76.3
1915	71.6	70.0	**68.9**	72.5	80.1	**81.1**	**83.1**	**82.8**	80.8	79.7	75.9	71.6	76.5
'16	**73.4**	69.8	71.1	73.2	77.7	79.0	79.3	80.1	78.8	77.4	73.4	70.9	75.4
'17	70.9	**68.2**	73.0	73.6	76.5	78.4	79.7	80.2	79.9	77.9	**71.1**	**68.0**	74.8
'18	68.2	72.1	73.6	75.6	76.1	78.6	79.5	79.7	79.7	78.1	74.3	72.5	75.7
'19	69.4	70.7	73.9	73.8	77.2	**77.9**	**78.4**	79.9	78.4	78.4	**78.1**	72.5	75.4
1920	70.9	69.3	72.0	77.9	78.4	79.5	81.0	80.2	79.3	76.5	74.8	72.0	75.9
'21	70.9	71.4	74.5	75.4	76.3	78.3	**78.4**	79.5	79.9	77.2	75.9	73.0	75.9
'22	72.3	72.7	75.6	77.7	77.4	79.0	80.6	81.0	80.0	78.4	75.4	**74.1**	**77.0**
'23	70.6	73.6	75.6	77.2	77.2	79.5	80.3	80.2	81.0	77.4	72.6	73.0	76.5
'24	73.0	69.2	72.0	76.6	77.9	80.4	80.4	81.7	79.5	77.4	73.4	73.2	76.2
Means	**70.6**	70.8	72.9	75.1	77.5	79.2	80.1	**80.3**	79.8	77.8	74.3	71.9	75.9

NOTE: Extreme values in bold-face type.

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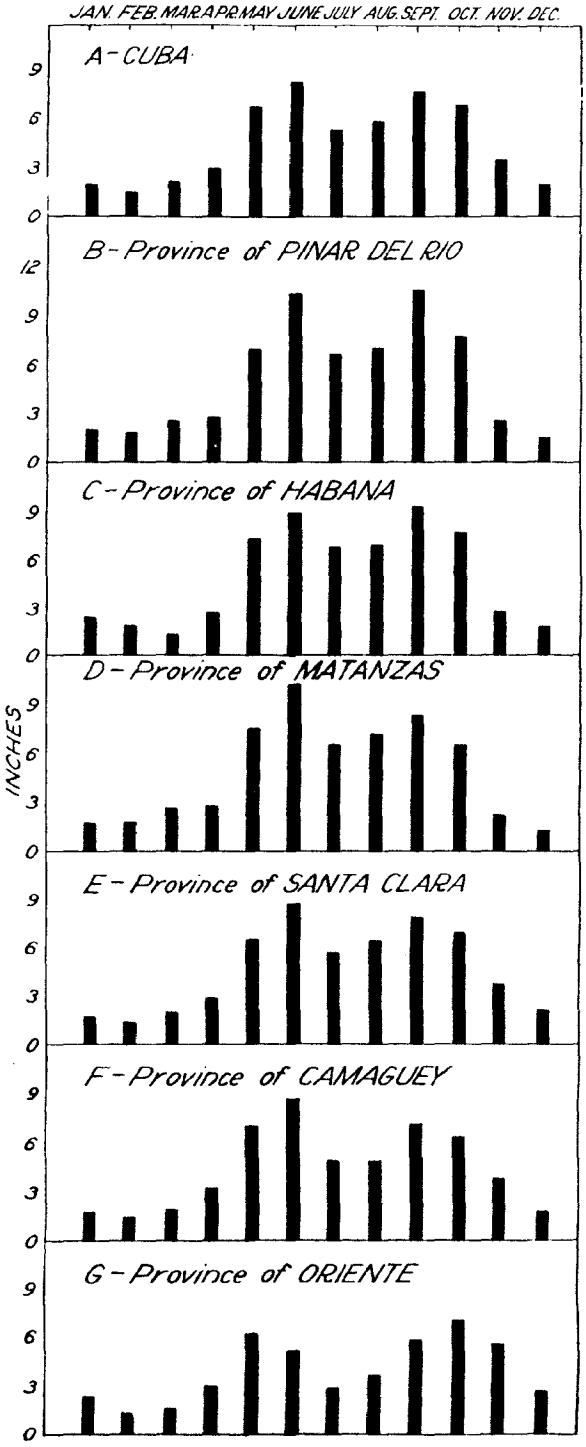

DIAGRAM 1.

Average monthly rainfall from 1899 to 1924, based upon records in 19 localities.

A. For the entire Island.
B–G. For the provinces.

(Expressed in inches and hundredths of an inch).

DIAGRAMA No. 1.

Precipitación promedia mensual de 1899 a 1924, basada sobre datos de 19 localidades.

A. Para toda la Isla.
B–G. Para las provincias.

(Expresada en pulgadas y centésimas de pulgada.)

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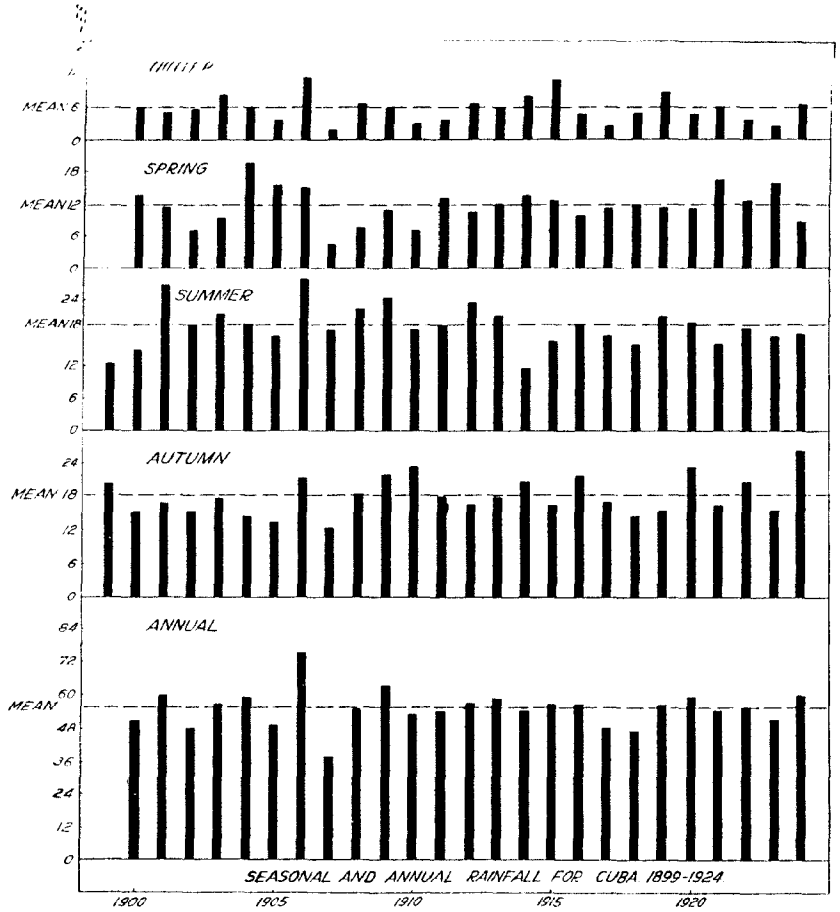

DIAGRAM 2.

Variations in the seasonal and annual rainfall of the Island of Cuba from 1899 to 1924.
Based upon records at 19 stations.
(Expressed in inches and hundredths of an inch.)

DIAGRAMA No. 2.

Variaciones en la precipitación anual y por estaciones de la Isla de Cuba, de 1899 a 1924.
Basada sobre datos en 19 localidades.
(Expresada en pulgadas y centésimas de pulgada.)

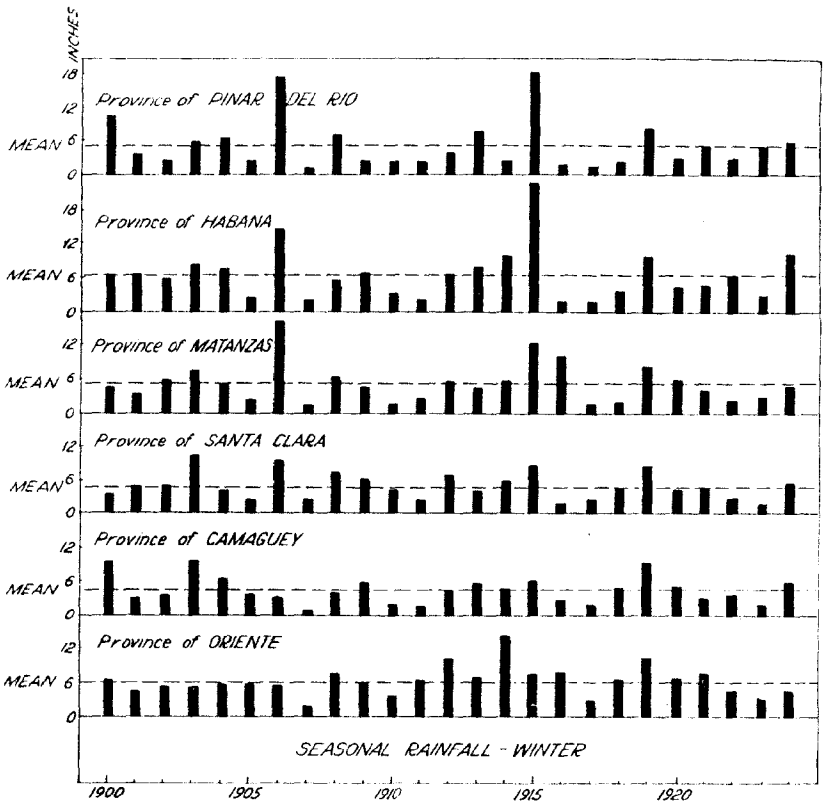

DIAGRAM 3.

Variations in the seasonal rainfall for the provinces, from 1899 to 1924. (Expressed in inches and hundredths of an inch.)

III (a). Variations in winter rainfall.

DIAGRAMA No. 3.

Variaciones de la lluvia por estaciones, en las provincias, de 1899 a 1924. (Expresadas en pulgadas y centésimas de pulgada.)

III (a). Variaciones en la lluvia de invierno.

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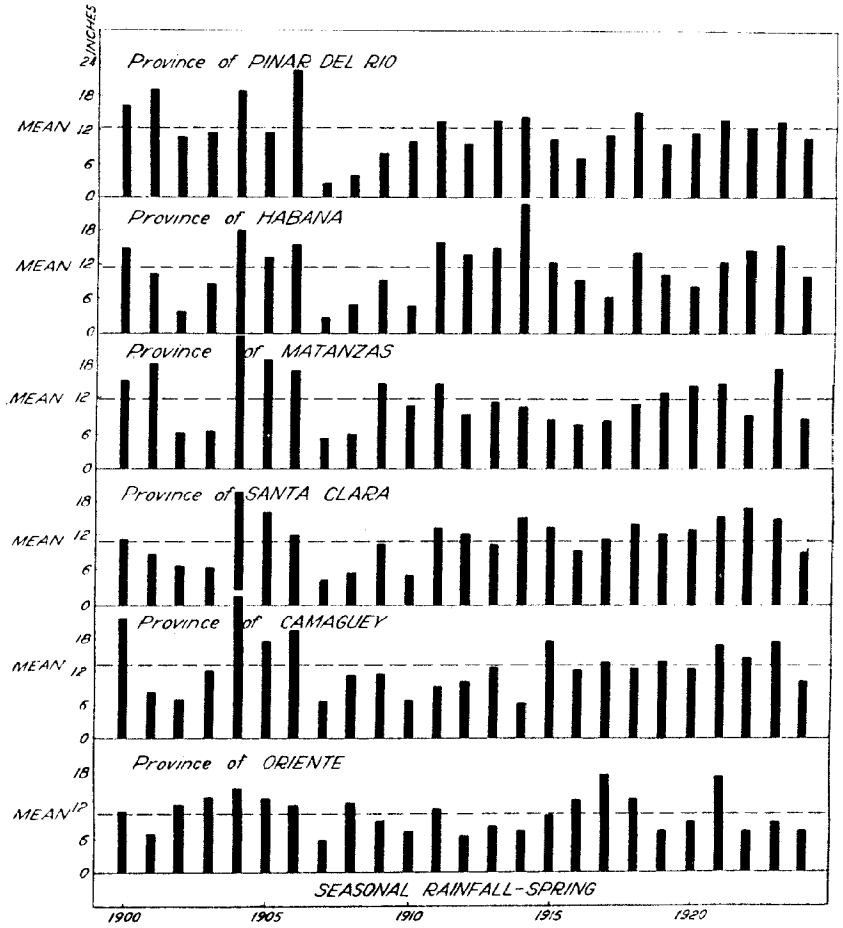
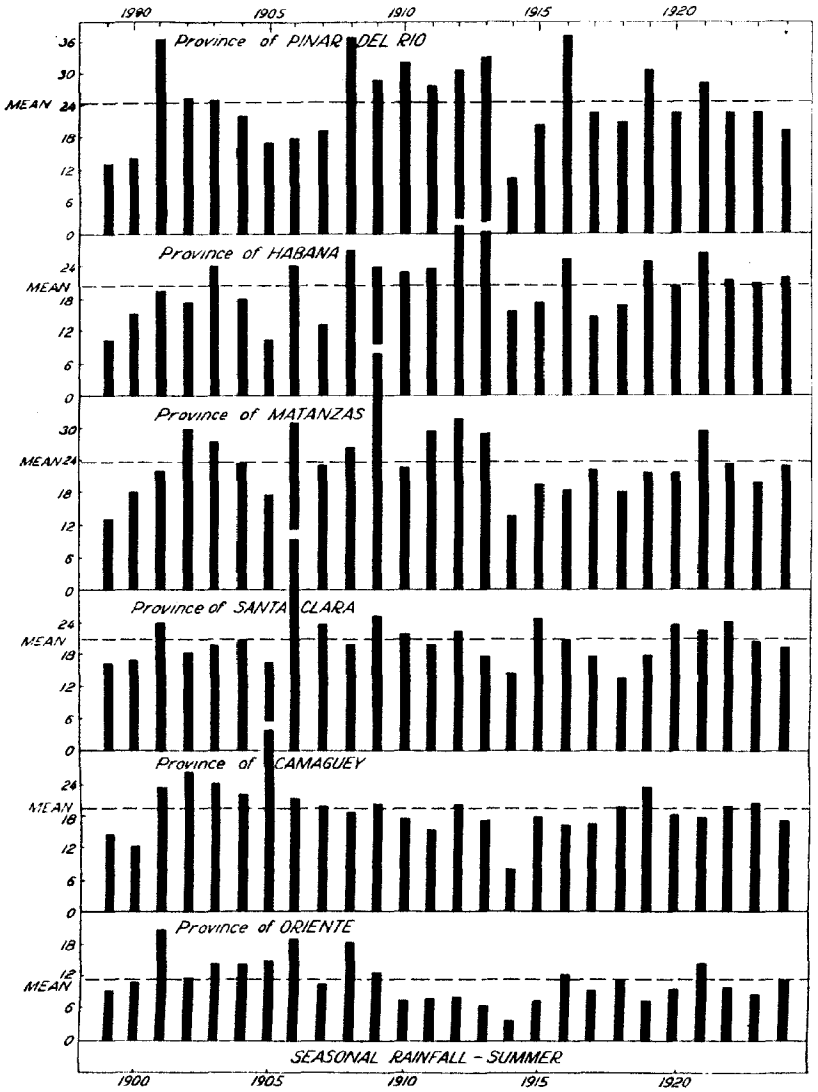


III (b).

III (b). Variations in spring rainfall.

III (b). Variaciones en la lluvia de primavera.



III (c).

III (c). Variations in summer rainfall.

III (c). Variaciones en la lluvia de verano.

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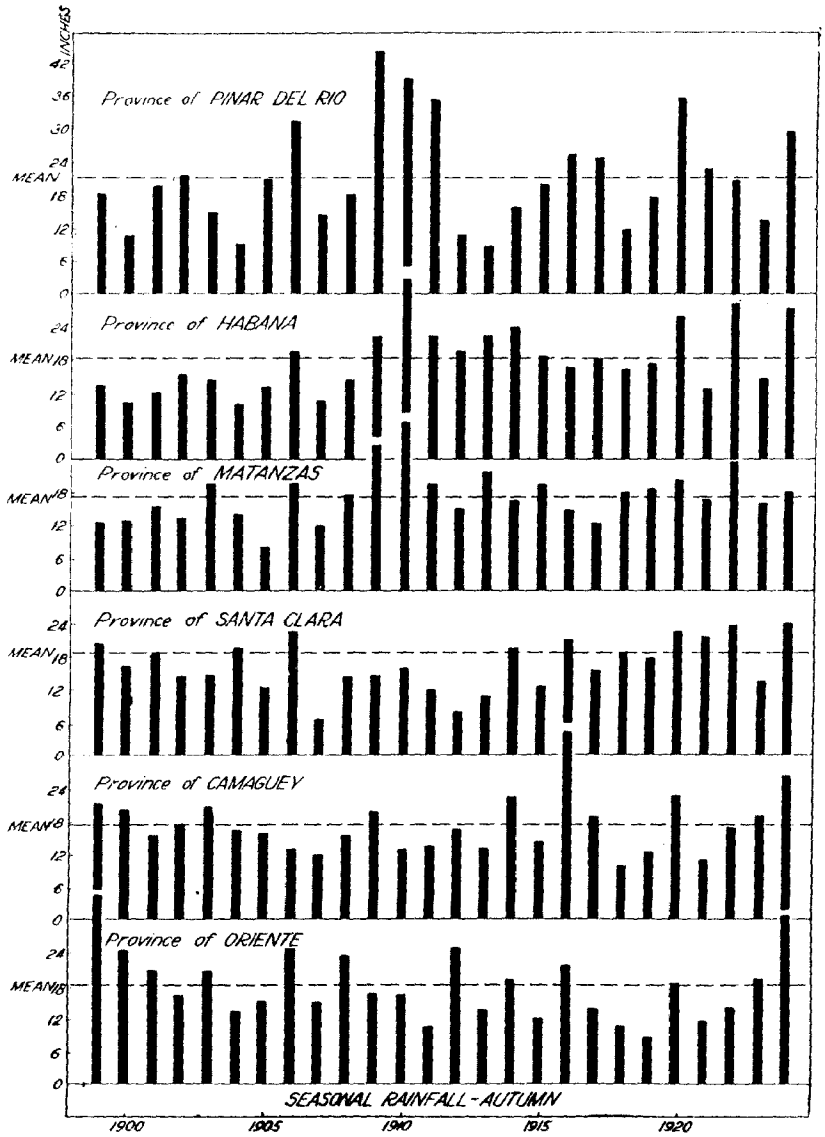

III (d). Variations in autumn rainfall.

III (d). Variaciones en la lluvia de otoño.