## CLIMATOLOGICAL DATA FOR CENTRAL AMERICA.

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The purpose of this paper is to combine in convenient form the widely scattered weather data for the several divisions of Central America found in the works mentioned under "Bibliography."

It is to be regretted that some regions will be represented by very meager data, that many of the series of observations are broken or even fragmentary, and that the periods of time to which the tables relate are synchronous for but few of the stations.

Before presenting the tabulated data it will be well to make a general survey of the physical influences that give to this region its rather diversified climate.

With respect to temperature conditions, three zones may be distinguished: The hot zone, *tierra caliente*, extending from the coast to an elevation of about 400 feet; the temperate zone, *tierra templada*, subdivided into two levels, the lower lying between the hot zone and an elevation of about 3,500 feet, the upper between this elevation and that of 7,500 feet; and the cold zone, *tierra fria*, including all regions with greater elevations.

The principal vegetable product of the different levels will indicate the effect of change of climate with ascent from the sea. The typical product of the hot zone is the banana, those of the lower and upper subdivisions of the temperate zone are coffee and cereals; the cold zone is not well adapted to agriculture, temperature below 40° occurring in all months of the year.

The precipitation received over this region shows wide variations both as to amount and distribution through the year and marked contrasts are to be found within short distances. This may be explained by refering to the rain-producing causes and to the interposed mountain barriers which set well-defined limits to which these causes are effective.

In his paper "Central American Rainfall" Harrington classifies the rains of this region under the following types: *Invierno*, trade wind, norther, and cyclonic. The *invierno* type is that due to the migratory movement of the equatorial rain belt following the course of the sun; its duration is from May to November, being somewhat shorter in the northern than in the southern regions. In the northern regions rains of this type have a single maximum about the time of the summer solstice, while in the southern regions there occur two maxima of precipitation corresponding roughly to the two zenith positions of the sun. In the interval, with diminished precipitation, there occurs about August the *veranillo*, or short dry season, which for reasons given later appears well defined only on the Pacific slope. With the passage of the sun to the south of the Equator and the consequent withdrawal of the rain belt there is marked diminution in this type of rainfall in November, and by December the *verano*, or long dry season, holds full sway, continuing until the coming of the rain belt about one month after the vernal equinox. The precipitation due to condensation of moisture carried by the trade winds is limited almost entirely to the Atlantic coasts and slopes, reaching its maximum from June to August. The rains accompanying "northers" generally extend no farther south than the crests of the mountains of Guatemala and to the northern coast of Honduras with maximum from December to February; those of rarer occurrence in connection with cyclonic disturbances in the Caribbean Sea reach, as a rule, to no great distance inland and appear only in the hurricane season. It is seen that nearly all of the Pacific coast receives rain from only the first of the sources mentioned, thus presenting the typical *invierno*, while the remaining regions have in addition to this other sources of moisture supply with rainfall throughout the year, the maximum amounts being received in some one of the months from June to November.

*Temperature.*—In this tropical region there is very little difference in temperature for stations at or near sea-level, but since the interior rises to considerable elevations there is found for the entire region a range in mean annual temperature of more than 20°. From an annual mean temperature of 80° at the coast stations there is decrease to a mean of 58° for an elevation of about 7,500 feet. For all levels temperatures are rather uniform throughout the year. Even at Quezaltenango (7,710 feet) the difference in the temperature means of the coldest and the warmest months is only 10°. The means at this station for January and June are 52° and 62° respectively, and by referring to similar values for the United States it is found that they are very near those for Washington for the months of April and May and for New Orleans for the months of January and March. Near the coasts the highest temperatures range about 95°; for moderate elevations they range about 90°, except where a valley exposure such as that of San Salvador may give extremes of 100° or slightly above; while for the most elevated station reporting (Quezaltenango) the highest temperature is 83°. Extreme minimum temperatures range from about 60° near the coast to 26° at the elevation of 7,700 feet.

Temperature means based on the formula max. + min. ÷ 2 are available for all stations with temperature records. These are given first, followed by tables giving mean maximum and mean minimum temperatures. Geographic coordinates and elevations are found in Table 7 under precipitation.

TABLE 1.—*Mean temperatures from daily extremes (° F.).*

| Stations. | Length of record (years). | January. | February. | March. | April. | May. | June. | July. | August. | September. | October. | November. | December. | Annual. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BRITISH HONDURAS. | | | | | | | | | | | | | | |
| Belize | 5 | 76.1 | 77.1 | 79.4 | 80.8 | 82.6 | 82.6 | 82.4 | 83.0 | 82.8 | 80.4 | 76.9 | 76.4 | 79.9 |
| GUATEMALA. | | | | | | | | | | | | | | |
| Chimax | 9 | 62.7 | 63.7 | 65.3 | 67.1 | 69.0 | 69.0 | 68.0 | 68.4 | 68.8 | 67.1 | 64.4 | 63.2 | 66.4 |
| Guatemala | 6 | 63.0 | 65.8 | 69.0 | 70.0 | 72.1 | 71.0 | 69.2 | 69.4 | 69.4 | 67.8 | 65.8 | 63.4 | 68.0 |
| Quezaltenango | 5 | 51.8 | 53.4 | 57.8 | 60.1 | 62.3 | 61.9 | 60.4 | 60.0 | 60.2 | 59.4 | 56.9 | 52.7 | 58.1 |
| SALVADOR. | | | | | | | | | | | | | | |
| San Salvador | 14 | 72.5 | 74.5 | 75.7 | 77.1 | 75.8 | 75.2 | 75.4 | 75.5 | 74.8 | 74.8 | 73.2 | 72.0 | 74.7 |
| NICARAGUA. | | | | | | | | | | | | | | |
| Bluefields | 3 | 78.3 | 77.7 | 80.8 | 82.4 | 80.8 | 79.2 | 79.3 | 79.3 | 79.2 | 79.5 | 79.2 | 78.4 | 79.5 |
| Greytown | 3 | 77.5 | 77.7 | 78.8 | 80.8 | 80.8 | 80.1 | 79.2 | 79.3 | 80.4 | 80.2 | 78.4 | 77.5 | 79.2 |
| COSTA RICA. | | | | | | | | | | | | | | |
| Ochoa | 3 | 74.8 | 75.0 | 75.9 | 77.4 | 78.8 | 78.3 | 77.4 | 77.5 | 78.6 | 78.6 | 76.8 | 75.6 | 77.1 |
| San Jose [1] | 5 | 67.3 | 68.7 | 70.2 | 70.5 | 70.7 | 69.2 | 69.1 | 68.8 | 68.6 | 68.4 | 68.3 | 66.9 | 68.9 |
| CANAL ZONE. | | | | | | | | | | | | | | |
| Ancon | 8 | 80.3 | 80.4 | 81.5 | 81.7 | 80.5 | 79.9 | 80.2 | 80.0 | 79.8 | 79.2 | 79.0 | 79.9 | 80.2 |
| Culebra | 7 | 77.6 | 77.5 | 78.5 | 79.7 | 79.4 | 79.1 | 79.0 | 79.0 | 78.8 | 78.3 | 77.8 | 78.0 | 78.6 |
| PANAMA. | | | | | | | | | | | | | | |
| Colon | 6 | 79.3 | 79.2 | 79.8 | 80.5 | 79.8 | 79.4 | 79.4 | 79.3 | 79.5 | 79.0 | 78.1 | 79.0 | 79.3 |

[1] Mean of readings at 6 a. m. and 1 p. m.

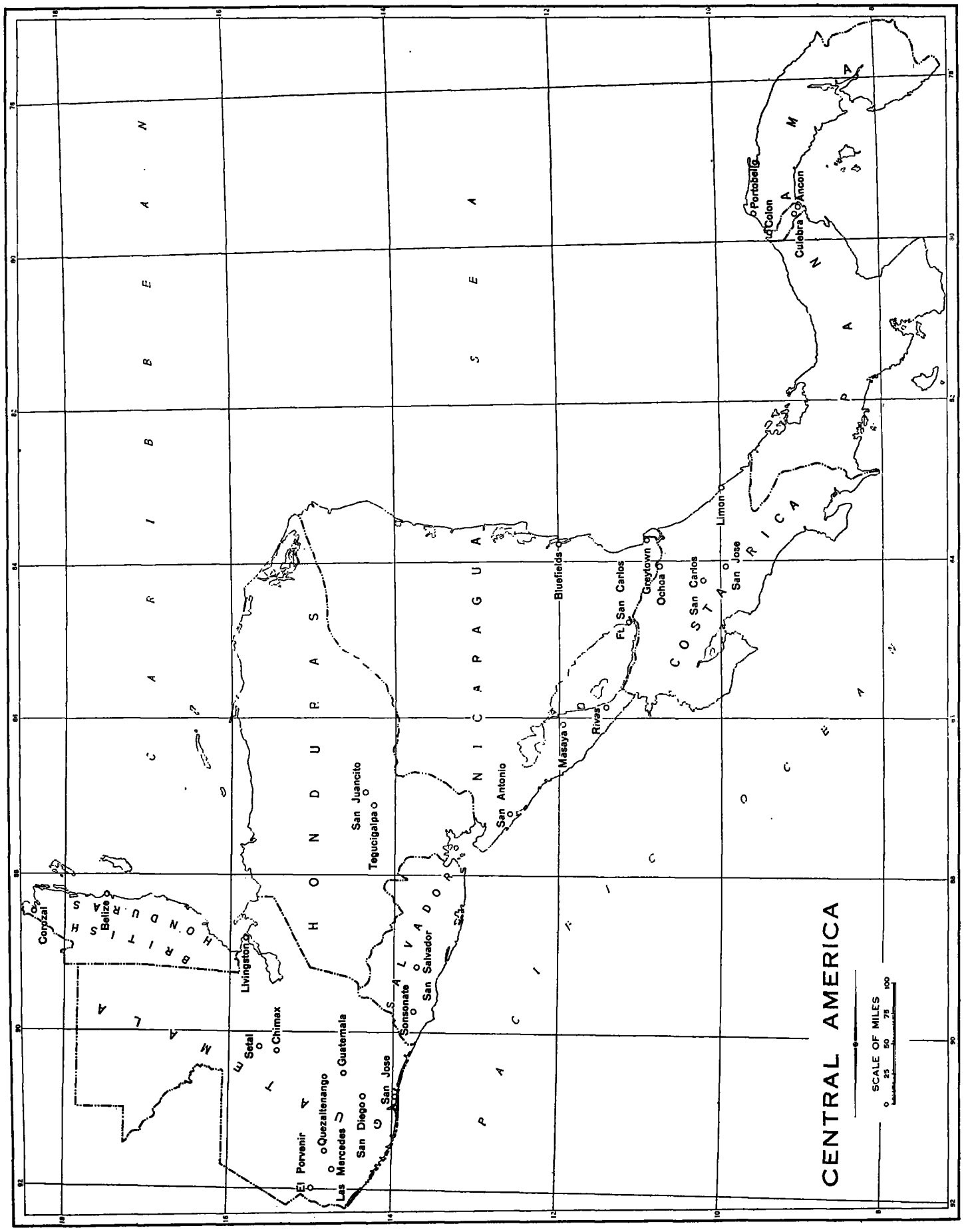
CENTRAL AMERICA
SCALE OF MILES
0 25 50 75 100
CARIBBEAN SEA
PACIFIC OCEAN
HONDURAS
NICARAGUA
COSTA RICA
PANAMA
GUATEMALA
BRITISH HONDURAS
EL SALVADOR
Corozal
Belize
Livingston
Setal
Chimax
Guatemala
Quezaltenango
El Porvenir
Las Mercedes
San Diego
San Jose
Sonsonate
San Salvador
Tegucigalpa
San Juancito
San Antonio
Masaya
Rivas
Bluefields
Greytown
Ochoa
San Carlos
Fl. San Carlos
Limon
San Jose
Portobello
Colon
Ancon
Culebra

TABLE 2.—*Mean maximum temperatures* (° *F.*).

| Stations. | Length of record (years). | January. | February. | March. | April. | May. | June. | July. | August. | September. | October. | November. | December. | Annual. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BRITISH HONDURAS. | | | | | | | | | | | | | | |
| Belize | 5 | 79.0 | 79.9 | 81.7 | 82.9 | 84.9 | 84.7 | 84.4 | 85.3 | 85.5 | 83.5 | 80.8 | 79.5 | 82.7 |
| GUATEMALA. | | | | | | | | | | | | | | |
| Chimax | 9 | 73.2 | 75.2 | 77.2 | 78.6 | 79.3 | 77.5 | 76.5 | 77.5 | 77.4 | 75.2 | 72.3 | 73.0 | 76.1 |
| Guatemala | 6 | 72.7 | 77.4 | 81.3 | 82.4 | 83.8 | 81.3 | 78.4 | 79.0 | 78.6 | 76.1 | 74.1 | 72.3 | 78.1 |
| Quezaltenango | 5 | 65.7 | 67.6 | 71.6 | 72.9 | 73.0 | 70.9 | 70.3 | 70.2 | 69.8 | 68.4 | 66.9 | 65.1 | 69.4 |
| SALVADOR. | | | | | | | | | | | | | | |
| San Salvador | 14 | 86.2 | 88.7 | 90.1 | 90.3 | 86.9 | 85.6 | 86.2 | 86.4 | 84.9 | 85.5 | 84.4 | 84.6 | 86.6 |
| COSTA RICA. | | | | | | | | | | | | | | |
| San Jose [2] | 5 | 75.2 | 77.5 | 79.5 | 78.4 | 78.3 | 75.9 | 75.4 | 75.4 | 75.4 | 74.8 | 75.4 | 73.2 | 76.2 |
| CANAL ZONE. | | | | | | | | | | | | | | |
| Ancon | 8 | 89.6 | 90.2 | 91.7 | 90.6 | 87.7 | 86.8 | 87.6 | 87.4 | 86.9 | 86.2 | 85.9 | 88.2 | 88.2 |
| Culebra | 7 | 85.7 | 86.3 | 87.6 | 88.6 | 86.6 | 85.9 | 85.9 | 86.0 | 85.9 | 85.2 | 84.0 | 85.3 | 86.1 |
| PANAMA. | | | | | | | | | | | | | | |
| Colon | 6 | 82.7 | 82.5 | 83.2 | 84.0 | 84.3 | 84.2 | 83.5 | 83.6 | 84.4 | 84.1 | 82.3 | 82.8 | 83.5 |

[2] Mean for 1 p. m.

TABLE 3.—*Mean minimum temperatures* (° *F.*).

| Stations. | Length of record (years). | January. | February. | March. | April. | May. | June. | July. | August. | September. | October. | November. | December. | Annual. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BRITISH HONDURAS. | | | | | | | | | | | | | | |
| Belize | 5 | 73.2 | 74.3 | 77.2 | 78.6 | 80.2 | 80.6 | 80.4 | 80.8 | 80.2 | 77.2 | 73.0 | 73.2 | 77.4 |
| GUATEMALA. | | | | | | | | | | | | | | |
| Chimax | 9 | 52.2 | 52.2 | 53.4 | 55.6 | 58.8 | 60.6 | 59.5 | 59.4 | 60.1 | 59.0 | 56.5 | 53.4 | 56.7 |
| Guatemala | 6 | 53.2 | 54.3 | 56.7 | 57.7 | 60.4 | 60.8 | 59.9 | 59.9 | 60.3 | 59.5 | 57.2 | 54.5 | 57.9 |
| Quezaltenango | 5 | 37.9 | 39.2 | 43.9 | 47.3 | 51.6 | 52.9 | 50.4 | 49.8 | 50.7 | 50.5 | 46.9 | 40.3 | 46.8 |
| SALVADOR. | | | | | | | | | | | | | | |
| San Salvador | 14 | 58.8 | 60.3 | 61.3 | 63.9 | 64.8 | 64.9 | 64.6 | 64.6 | 64.6 | 64.2 | 62.1 | 59.5 | 62.8 |
| COSTA RICA. | | | | | | | | | | | | | | |
| San Jose [3] | 5 | 59.4 | 59.9 | 61.0 | 62.6 | 63.1 | 62.6 | 62.8 | 62.2 | 61.7 | 61.9 | 61.2 | 60.6 | 61.6 |
| CANAL ZONE. | | | | | | | | | | | | | | |
| Ancon | 8 | 71.0 | 70.6 | 71.3 | 72.7 | 73.4 | 73.0 | 72.9 | 72.7 | 72.8 | 72.2 | 73.0 | 71.6 | 72.2 |
| Culebra | 7 | 69.7 | 69.0 | 69.7 | 71.0 | 72.2 | 72.2 | 72.1 | 72.0 | 71.8 | 71.4 | 71.8 | 70.7 | 71.1 |
| PANAMA. | | | | | | | | | | | | | | |
| Colon | 6 | 75.9 | 75.9 | 76.4 | 76.9 | 75.1 | 74.8 | 75.3 | 75.0 | 74.6 | 73.9 | 74.0 | 75.2 | 75.2 |

[3] Mean for 6 a. m.

Means for temperature obtained by use of the formula employed in Table 1 are probably slightly higher than the true values, hence the following table with probably more accurate values for a few stations is added.

TABLE 4.—*Mean temperatures by other formulae* (°*F.*).

(Compare with Table 1.)

| Stations. | Length of record (years). | January. | February. | March. | April. | May. | June. | July. | August. | September. | October. | November. | December. | Annual. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Belize [1] | 8 | 74.8 | 76.6 | 79.2 | 79.9 | 81.9 | 82.4 | 82.6 | 82.6 | 82.0 | 79.3 | 76.1 | 73.6 | 79.3 |
| Chimax [1] | 14 | 59.7 | 61.3 | 63.5 | 66.0 | 67.5 | 67.3 | 66.2 | 66.6 | 66.7 | 64.8 | 62.8 | 59.9 | 64.4 |
| Guatemala [2] | 21 | 61.3 | 62.8 | 65.7 | 67.6 | 68.0 | 66.2 | 65.8 | 66.0 | 65.7 | 64.8 | 62.8 | 61.3 | 64.8 |
| Tegucigalpa [1] | 2 | 66.0 | 68.4 | 70.5 | 73.4 | 76.1 | 75.4 | 74.3 | 73.2 | 72.5 | 71.2 | 70.5 | 66.9 | 71.5 |
| San Salvador [3] | 23 | 71.9 | 72.8 | 74.7 | 76.1 | 75.9 | 74.4 | 74.5 | 74.2 | 73.4 | 73.1 | 72.4 | 71.8 | 73.8 |
| San José [4] | 12 | 66.0 | 66.7 | 67.8 | 68.7 | 68.9 | 68.2 | 67.6 | 67.5 | 67.6 | 67.3 | 66.9 | 65.8 | 67.4 |

[1] Reduction to true mean by Hann.
[2] Formula, 7a+2p+9p÷3.
[3] Formula, 7a+2p+9p+9p÷4.
[4] Hourly readings from thermograph.

TABLE 5.—*Temperature extremes—Maximum* (°*F.*).

| Stations. | Length of record (years). | January. | February. | March. | April. | May. | June. | July. | August. | September. | October. | November. | December. | Annual. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Belize | 10 | 87 | 89 | 92 | 95 | 91 | 93 | 92 | 92 | 92 | 92 | 89 | 88 | 95 |
| Chimax | 11 | 83 | 88 | 91 | 90 | 88 | 86 | 82 | 82 | 84 | 84 | 84 | 84 | 91 |
| Guatemala | 13 | 86 | 85 | 86 | 90 | 89 | 86 | 84 | 83 | 82 | 82 | 83 | 83 | 90 |
| Quezaltenango | 6 | 78 | 73 | 79 | 80 | 83 | 77 | 77 | 75 | 75 | 75 | 72 | 69 | 83 |
| San Salvador | 5 | 101 | 103 | 103 | 103 | 103 | 97 | 96 | 98 | 100 | 101 | 102 | 102 | 103 |
| San José | 12 | 86 | 90 | 91 | 94 | 90 | 85 | 85 | 85 | 86 | 85 | 84 | 85 | 94 |
| Ancon | 8 | 93 | 95 | 96 | 97 | 96 | 95 | 95 | 94 | 93 | 95 | 94 | 94 | 97 |
| Culebra | 7 | 90 | 91 | 93 | 96 | 96 | 92 | 92 | 92 | 91 | 92 | 90 | 92 | 96 |
| Colon | 6 | 88 | 88 | 88 | 90 | 91 | 92 | 89 | 89 | 90 | 90 | 89 | 89 | 92 |

TABLE 6.—*Temperature extremes—Minimum* (°*F.*).

| Stations. | Length of record (years). | January. | February. | March. | April. | May. | June. | July. | August. | September. | October. | November. | December. | Annual. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Belize | 10 | 59 | 58 | 61 | 60 | 69 | 72 | 72 | 70 | 72 | 67 | 61 | 56 | 56 |
| Chimax | 11 | 36 | 38 | 38 | 43 | 46 | 51 | 52 | 51 | 50 | 45 | 44 | 37 | 36 |
| Guatemala | 13 | 41 | 43 | 41 | 47 | 52 | 52 | 51 | 52 | 54 | 50 | 44 | 41 | 41 |
| Quezaltenango | 6 | 26 | 27 | 28 | 36 | 35 | 39 | 38 | 38 | 38 | 38 | 31 | 28 | 26 |
| San Salvador | 5 | 45 | 51 | 54 | 54 | 58 | 61 | 61 | 60 | 60 | 58 | 52 | 50 | 45 |
| San José | 12 | 50 | 47 | 48 | 51 | 53 | 56 | 56 | 56 | 56 | 56 | 52 | 49 | 47 |
| Ancon | 8 | 63 | 66 | 65 | 64 | 69 | 70 | 67 | 69 | 68 | 68 | 67 | 66 | 63 |
| Culebra | 7 | 60 | 59 | 61 | 62 | 68 | 67 | 67 | 68 | 67 | 66 | 67 | 64 | 59 |
| Colon | 6 | 70 | 71 | 67 | 72 | 71 | 70 | 70 | 71 | 71 | 70 | 69 | 66 | 66 |

*Precipitation.*—Relative to precipitation received, the region may be divided into two parts: The Pacific slope with moderately heavy rainfall of the *invierno* type, following the course of the sun from May to October, and with very light to scant amount during the *verano;* and the mountainous region, eastern slope, and eastern coast with rainfall throughout the year and with highly excessive amounts at many stations during the period of maximum fall. In the latter regions, where there is more than one source of moisture supply, there arise great

differences in the amounts of precipitation received annually, with considerable difference in the time of maximum, which occurs within the period from June to December. For the several political divisions the ranges in amounts are as follows: British Honduras, 50 to 80 inches; Salvador, 60 to 90 inches; Canal Zone–Panama, 70 to 160 inches; Guatemala, 30 to 200 inches; Nicaragua, 55 to 255 inches. The greatest annual average is 255 inches at Greytown, Nicaragua, and the least is 28 inches at the high station in Guatemala, Quezaltenango. Numerous stations in Guatemala have several successive months with average precipitation above 20 inches; this is found at Greytown also, the averages for July and December being the unusual amounts of 34 and 36 inches, respectively. The following are low averages at stations with long records for the period December–April: Rivas, Nicaragua, 2.34 inches; Guatemala, Guatemala, 3.06 inches; San Salvador, Salvador, 3.43 inches; San José, Costa Rica, 4.90 inches. Table 7 sets forth other interesting contrasts in precipitation.

TABLE 7.—*Monthly and annual average precipitation (inches).*

| Stations. | North latitude. | West longitude (Greenwich). | Elevation, feet. | Length of record, years. | Jan. | Feb. | Mar. | Apr. | May. | June. | July. | Aug. | Sept. | Oct. | Nov. | Dec. | Annual. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BRITISH HONDURAS. | ° ′ | ° ′ | | | | | | | | | | | | | | | |
| Belize | 17 29 | 88 14 | ..... | 24 | 7.44 | 3.22 | 2.47 | 2.23 | 4.91 | 7.86 | 8.23 | 8.27 | 9.38 | 10.58 | 13.29 | 6.65 | 84.53 |
| Corozal [1] | 18 22 | 88 26 | ..... | 16 | 2.57 | 1.47 | 1.24 | 1.36 | 3.99 | 8.74 | 6.95 | 5.80 | 6.41 | 6.70 | 5.19 | 2.05 | 52.47 |
| GUATEMALA. | | | | | | | | | | | | | | | | | |
| Chimax | 15 40 | 90 10 | 4,260 | 20 | 6.00 | 4.22 | 4.54 | 4.28 | 8.28 | 11.85 | 10.11 | 7.96 | 9.88 | 13.54 | 8.63 | 6.68 | 95.97 |
| El Porvenir | 14 59 | 91 57 | 3,000 | 14 | 2.54 | 2.85 | 5.13 | 10.46 | 21.70 | 27.87 | 18.98 | 20.28 | 23.29 | 21.88 | 8.40 | 2.74 | 166.12 |
| Guatemala | 14 37 | 90 31 | 4,855 | 29 | .30 | .13 | .47 | 1.22 | 6.00 | 10.84 | 7.98 | 7.77 | 9.11 | 6.76 | .94 | .32 | 51.84 |
| Las Mercedes | 14 42 | 91 46 | 3,280 | 20 | 1.42 | 2.05 | 3.70 | 8.27 | 20.24 | 24.65 | 18.98 | 20.63 | 23.46 | 21.93 | 6.54 | 2.28 | 154.15 |
| Livingston | 15 49 | 88 47 | 65 | 3 | 25.62 | 7.50 | 8.53 | 5.80 | 18.85 | 17.80 | 23.34 | 26.11 | 24.16 | 13.14 | 13.09 | 14.98 | 198.92 |
| Magdalena | 15 24 | 91 7 | 7,220 | 11 | .26 | .12 | 1.22 | 1.34 | 3.18 | 6.72 | 5.49 | 5.42 | 7.14 | 4.32 | 1.15 | .23 | 36.59 |
| Panzos | 15 25 | 89 40 | 118 | 7 | 3.34 | 1.49 | 2.93 | 3.22 | 10.54 | 23.17 | 23.82 | 17.39 | 18.60 | 10.39 | 5.07 | 2.94 | 122.90 |
| Patulul | 14 25 | 91 10 | 666 | 3 | .66 | .11 | 1.59 | 3.25 | 16.97 | 19.47 | 11.77 | 21.26 | 19.06 | 16.86 | 5.16 | .20 | 116.3 |
| Quezaltenango | 14 57 | 91 30 | 7,710 | 4 | .04 | .14 | .02 | .59 | 5.13 | 6.18 | 3.26 | 3.86 | 4.75 | 3.54 | .47 | .21 | 28.19 |
| Samac | 15 40 | 90 20 | 4,260 | 17 | 12.16 | 8.46 | 8.50 | 9.09 | 12.76 | 17.80 | 12.95 | 10.39 | 14.65 | 22.60 | 15.87 | 13.82 | 159.05 |
| Salama | 15 6 | 90 17 | 3,050 | 4 | .00 | .00 | .47 | 1.89 | 3.15 | 9.17 | 4.02 | 3.19 | 3.11 | 3.62 | 1.34 | .12 | 30.08 |
| San Diego | 14 22 | 90 49 | 1,800 | 6 | 1.14 | 1.46 | 5.39 | 6.50 | 19.65 | 27.48 | 12.36 | 14.49 | 20.08 | 19.06 | 6.42 | 1.02 | 135.05 |
| San Francisco Miramar | 14 40 | 91 48 | 2,430 | 25 | 1.50 | 1.56 | 3.54 | 9.20 | 19.80 | 27.04 | 19.52 | 22.35 | 28.18 | 25.64 | 7.50 | 2.99 | 168.82 |
| San Jose | 13 55 | 90 50 | 10 | 3 | .00 | .44 | .00 | .32 | 4.77 | 11.58 | 8.38 | 10.02 | 11.58 | 7.20 | 1.26 | .25 | 55.80 |
| San Luis | 14 53 | 92 0 | 2,300 | 11 | 1.96 | 3.65 | 4.87 | 12.26 | 23.97 | 28.04 | 21.25 | 25.90 | 31.18 | 27.46 | 9.86 | 2.31 | 192.71 |
| Setal | 15 47 | 90 10 | 2,430 | 17 | 15.24 | 11.30 | 9.96 | 8.54 | 11.46 | 20.98 | 18.11 | 15.43 | 19.84 | 28.46 | 18.54 | 15.28 | 193.14 |
| HONDURAS. | | | | | | | | | | | | | | | | | |
| San Juancito | 14 17 | 86 40 | ..... | 4 | 1.94 | .91 | 2.50 | 3.14 | 6.72 | 11.22 | 8.36 | 7.21 | 8.00 | 7.81 | 5.64 | 2.24 | 65.69 |
| SALVADOR. | | | | | | | | | | | | | | | | | |
| La Laguna | 13 39 | 89 15 | 2,490 | 5 | .08 | .04 | 1.57 | 1.81 | 8.23 | 9.92 | 15.47 | 11.46 | 11.22 | 14.53 | 1.34 | .08 | 75.75 |
| Mirasol | 13 47 | 89 15 | 2,300 | 5 | .00 | .12 | 2.80 | 3.94 | 8.90 | 10.94 | 14.13 | 13.62 | 11.42 | 10.35 | 2.13 | .00 | 78.35 |
| San Salvador | 13 42 | 89 12 | 2,155 | 23 | .17 | .21 | .50 | 1.96 | 6.69 | 11.13 | 12.11 | 11.72 | 11.03 | 10.37 | 1.79 | .59 | 68.27 |
| Santa Lucia | 13 45 | 89 16 | 4,500 | 5 | .12 | .04 | 2.48 | 4.33 | 8.07 | 12.09 | 18.07 | 15.16 | 14.25 | 12.32 | 2.60 | .16 | 89.69 |
| Santa Tecla | 13 39 | 89 18 | 3,000 | 8 | .00 | .08 | .32 | 1.26 | 8.50 | 10.04 | 13.35 | 12.68 | 12.16 | 7.56 | 2.87 | .47 | 69.29 |
| Sonsonate | 13 43 | 89 44 | 745 | 10 | .00 | .08 | 1.18 | 1.57 | 7.23 | 9.55 | 9.79 | 9.99 | 9.68 | 11.22 | 2.08 | .23 | 62.60 |
| NICARAGUA. | | | | | | | | | | | | | | | | | |
| Bluefields | 12 0 | 83 45 | ..... | 5 | 9.86 | 6.93 | 3.61 | 3.12 | 8.08 | 17.00 | 28.58 | 16.07 | 8.74 | 11.22 | 11.40 | 14.28 | 138.89 |
| Fort San Carlos | 11 8 | 84 48 | 108 | 3 | 4.45 | 2.99 | 1.02 | 1.65 | 8.54 | 10.94 | 12.68 | 10.83 | 12.09 | 11.06 | 8.23 | 5.08 | 89.56 |
| Granada | 11 56 | 85 58 | 197 | 10 | .22 | .04 | .10 | .87 | 7.89 | 12.87 | 11.34 | 8.66 | 10.38 | 12.75 | 2.73 | .31 | 68.16 |
| Greytown | 10 55 | 83 43 | ..... | 6 | 22.50 | 10.77 | 6.11 | 11.20 | 17.86 | 23.19 | 34.41 | 27.28 | 17.40 | 19.98 | 36.45 | 27.76 | 254.91 |
| Managua | 12 10 | 86 15 | 135 | 3 | .00 | .00 | .00 | .00 | 5.43 | 11.29 | 6.45 | 4.95 | 6.86 | 14.56 | 3.62 | .18 | 53.34 |
| Masaya | 11 58 | 86 5 | 785 | 12 | .14 | .19 | .20 | .28 | 5.58 | 16.53 | 6.62 | 7.49 | 17.06 | 11.00 | 1.96 | .37 | 67.42 |
| Rivas | 11 26 | 85 47 | 150 | 21 | .46 | .20 | .15 | .26 | 8.19 | 11.83 | 7.20 | 8.07 | 10.17 | 17.38 | 4.58 | 1.27 | 69.76 |
| Sabalos | 11 2 | 84 22 | ..... | 3 | 6.26 | 4.06 | 2.16 | 3.07 | 8.58 | 12.28 | 17.84 | 14.65 | 12.24 | 11.61 | 9.02 | 8.11 | 109.88 |
| San Antonio | 12 35 | 87 3 | 66 | 6 | .04 | .07 | .30 | .30 | 10.43 | 12.53 | 8.83 | 9.15 | 13.65 | 20.48 | 3.58 | .22 | 79.58 |
| Valle Menier | 11 46 | 86 3 | 490 | 4 | .09 | .00 | .00 | .05 | 7.41 | 10.31 | 5.91 | 7.44 | 6.87 | 17.74 | 5.13 | .20 | 61.15 |
| COSTA RICA. | | | | | | | | | | | | | | | | | |
| Boca Banana | 9 55 | 83 0 | ..... | 7 | 12.91 | 6.46 | 7.64 | 10.93 | 7.52 | 5.98 | 12.28 | 13.31 | 5.00 | 6.54 | 11.46 | 12.95 | 112.98 |
| Juan Vinas | 9 53 | 83 48 | 3,410 | 6 | 8.94 | 3.07 | 2.56 | 4.84 | 8.50 | 8.03 | 8.50 | 8.35 | 5.94 | 8.23 | 8.23 | 10.47 | 85.66 |
| La Verbena | ..... | ..... | 3,740 | 6 | .32 | .16 | .35 | 1.18 | 7.68 | 12.56 | 9.49 | 7.52 | 11.50 | 14.80 | 8.46 | 2.20 | 76.22 |
| Limon | 10 0 | 83 5 | ..... | 7 | 14.57 | 6.45 | 7.06 | 10.62 | 8.50 | 6.22 | 16.87 | 12.23 | 5.69 | 5.01 | 11.86 | 16.64 | 121.72 |
| Ochoa | 10 48 | 84 10 | ..... | 3 | 12.09 | 8.86 | 7.13 | 7.87 | 13.74 | 16.14 | 22.76 | 18.70 | 15.75 | 8.15 | 19.25 | 18.50 | 168.94 |
| Peralta | 10 1 | 83 37 | 1,090 | 6 | 9.28 | 6.21 | 7.27 | 8.58 | 14.06 | 13.40 | 11.86 | 12.69 | 10.18 | 12.09 | 13.56 | 16.31 | 135.49 |
| San Carlos | 10 13 | 84 29 | 525 | 6 | 9.37 | 6.14 | 4.88 | 5.39 | 11.38 | 13.23 | 16.50 | 14.25 | 12.52 | 17.09 | 19.13 | 14.73 | 144.61 |
| San Francisco Guadelupe | 9 58 | 84 2 | 3,895 | 7 | .79 | .16 | .75 | 2.09 | 8.15 | 11.57 | 10.28 | 8.62 | 11.50 | 12.24 | 6.46 | 1.26 | 73.87 |
| San Jose | 9 56 | 84 7 | 3,760 | 34 | .60 | .18 | .77 | 1.76 | 9.04 | 9.53 | 8.27 | 9.53 | 12.04 | 11.78 | 5.75 | 1.59 | 70.84 |
| Sarapiqui | 10 15 | 84 8 | 2,750 | 6 | 19.56 | 9.28 | 6.37 | 10.67 | 19.41 | 21.10 | 19.36 | 18.26 | 14.21 | 22.66 | 29.94 | 18.62 | 209.45 |
| Siquirres | 10 6 | 83 35 | 197 | 5 | 16.08 | 8.48 | 7.82 | 12.45 | 8.44 | 9.35 | 10.03 | 10.17 | 5.49 | 7.68 | 11.36 | 15.22 | 122.57 |
| Tres Rios | 9 55 | 84 15 | 4,260 | 14 | .35 | .12 | .28 | 2.05 | 7.28 | 11.26 | 7.99 | 9.09 | 8.86 | 15.51 | 6.18 | 1.93 | 70.90 |
| Turrialba | 9 50 | 83 45 | 2,035 | 7 | 8.86 | 2.24 | 2.80 | 7.68 | 8.11 | 11.77 | 10.63 | 10.55 | 9.57 | 9.21 | 7.32 | 15.79 | 104.53 |
| CANAL ZONE. | | | | | | | | | | | | | | | | | |
| Balboa | ..... | ..... | ..... | 23 | 1.00 | .69 | .74 | 3.82 | 7.83 | 7.20 | 7.90 | 7.79 | 6.98 | 9.55 | 9.30 | 5.15 | 67.95 |
| Balboa Heights [3] | ..... | ..... | 118 | 24 | .95 | .84 | .72 | 3.00 | 8.24 | 7.46 | 7.64 | 7.97 | 7.75 | 10.32 | 10.35 | 4.12 | 69.36 |
| Culebra | 9 2 | 79 45 | ..... | 31 | 1.47 | .63 | .56 | 3.62 | 10.69 | 8.87 | 9.47 | 10.07 | 10.99 | 11.67 | 12.23 | 6.57 | 86.84 |
| Frijoles | ..... | ..... | ..... | 10 | 1.79 | 2.19 | .57 | 4.61 | 10.65 | 10.42 | 11.59 | 10.83 | 11.57 | 16.10 | 15.95 | 5.50 | 101.77 |
| Gamboa | 9 10 | 79 50 | ..... | 39 | 1.64 | .95 | .69 | 3.57 | 10.50 | 9.70 | 10.26 | 11.80 | 10.44 | 13.05 | 11.79 | 6.40 | 90.79 |
| Gatun | ..... | ..... | ..... | 17 | 2.88 | 2.59 | 1.92 | 5.59 | 13.27 | 12.35 | 11.98 | 14.40 | 10.07 | 16.18 | 19.15 | 9.62 | 120.00 |
| Rio Grande | ..... | ..... | ..... | 17 | 1.02 | .62 | .35 | 3.34 | 10.07 | 9.12 | 9.73 | 9.33 | 10.64 | 12.77 | 11.20 | 5.03 | 83.22 |
| PANAMA. | | | | | | | | | | | | | | | | | |
| Alhajuela | ..... | ..... | ..... | 22 | .96 | .76 | .45 | 3.54 | 11.51 | 12.06 | 13.07 | 12.49 | 11.45 | 14.89 | 13.75 | 5.52 | 100.45 |
| Colon [3] | 9 22 | 79 55 | 25 | 51 | 3.69 | 1.62 | 1.57 | 4.35 | 12.48 | 13.39 | 15.89 | 15.07 | 12.51 | 14.94 | 21.02 | 11.32 | 127.85 |
| Porto Bello | ..... | ..... | ..... | 10 | 5.85 | 3.54 | 2.08 | 7.73 | 15.90 | 16.08 | 18.04 | 21.04 | 12.74 | 13.68 | 26.48 | 16.84 | 160.00 |

[1] Santa Rita Plantation. [2] Station at Ancon prior to October 1, 1914. [3] Within Canal Zone.

In addition to the averages of precipitation it is interesting and important to know the variations from month to month and from year to year. This is shown for a number of stations representing practically all regions in Table 8, which gives the monthly amounts for individual years, also the greatest and least monthly amounts during the period of observation.

TABLE 8.—*Monthly and annual precipitation (in inches).*

BELIZE, BRITISH HONDURAS.

| Year. | January. | February. | March. | April. | May. | June. | July. | August. | September. | October. | November. | December. | Annual. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1894 | 6.60 | 1.25 | 1.50 | 0.04 | 13.78 | 5.81 | 8.01 | 3.90 | 4.49 | 5.90 | 13.97 | 3.49 | 68.74 |
| 1895 | .99 | 3.34 | .08 | 4.15 | 6.29 | 13.64 | 2.62 | 6.70 | 24.07 | 11.55 | 11.64 | 4.75 | 89.82 |
| 1896 | 3.67 | .71 | 4.77 | 2.37 | 3.64 | 10.21 | 14.22 | 6.97 | 2.15 | 6.26 | 17.44 | 4.72 | 77.13 |
| 1897 | 1.81 | 3.73 | 3.60 | 10.63 | 5.14 | 11.31 | 7.81 | 6.31 | 6.22 | 4.87 | 19.80 | 5.99 | 87.22 |
| 1898 | 7.73 | 1.16 | .65 | 2.89 | 2.85 | 26.25 | 4.94 | 13.26 | 16.17 | 13.50 | 6.81 | 3.85 | 100.06 |
| 1899 | 5.87 | 1.44 | 2.17 | 2.04 | 3.11 | 6.88 | 4.39 | 8.00 | 6.19 | 16.00 | 11.58 | 5.70 | 73.37 |
| 1909 | 5.75 | .00 | .00 | 7.00 | .00 | 6.30 | 3.60 | 8.24 | 5.95 | 18.05 | 5.50 | 4.10 | 64.49 |
| 1910 | 6.02 | 2.90 | 7.23 | 1.65 | 12.80 | 4.06 | 6.00 | 5.55 | 5.80 | 5.45 | 5.15 | 1.15 | 63.76 |
| 1911 | 12.58 | 3.80 | 1.45 | 1.30 | 26.39 | 22.40 | 12.39 | 7.65 | 13.85 | 2.70 | 20.12 | 6.30 | 130.93 |
| 1912 | 13.20 | .00 | 3.22 | .10 | 8.40 | 8.70 | 10.22 | 10.37 | 8.10 | 7.29 | 9.33 | 15.52 | 97.45 |
| 1913 | 10.28 | 1.80 | .60 | 8.28 | 7.16 | 7.10 | 13.10 | 6.20 | 13.52 | 30.17 | 15.73 | 12.80 | 126.74 |
| 1914 | 12.58 | 5.40 | .90 | .13 | 2.90 | 12.05 | 5.15 | 5.75 | 10.75 | 13.20 | 18.50 | 10.45 | 97.76 |
| 1915 | 9.40 | 1.15 | 2.60 | .83 | 3.85 | 9.67 | 9.35 | 6.70 | 12.00 | 10.35 | 15.30 | 5.25 | 86.45 |
| Means [1] | 7.44 | 3.22 | 2.47 | 2.23 | 4.91 | 7.83 | 8.23 | 8.27 | 9.38 | 10.58 | 13.29 | 6.65 | 84.53 |
| Greatest | 16.20 | 5.40 | 7.23 | 10.63 | 26.39 | 26.25 | 14.22 | 13.26 | 24.07 | 30.17 | 20.12 | 15.52 | 130.93 |
| Least | .99 | .00 | .00 | .04 | .00 | 4.06 | 2.62 | 3.90 | 2.15 | 2.70 | 5.15 | 1.15 | 63.76 |

COROZAL, BRITISH HONDURAS.

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1882 | ..... | ..... | ..... | ..... | ..... | 5.30 | 2.74 | 8.03 | 5.63 | 2.45 | 2.87 | 2.64 | ..... |
| 1883 | 3.22 | 2.41 | 3.99 | 0.31 | 2.01 | 7.93 | 7.05 | 4.50 | 8.12 | 8.15 | 5.80 | 3.58 | 57.07 |
| 1884 | 4.84 | 1.54 | .78 | 2.30 | 4.09 | 4.46 | 7.34 | 5.96 | 4.83 | 14.14 | 5.41 | 2.68 | 58.37 |
| 1885 | 4.10 | .47 | .44 | 2.58 | 2.77 | 3.39 | 1.79 | 2.56 | 3.55 | 7.29 | 2.91 | 1.92 | 33.68 |
| 1886 | .46 | 1.74 | .18 | 1.86 | 10.95 | 3.86 | 11.72 | 4.61 | 13.24 | 3.66 | 6.83 | .81 | 59.92 |
| 1887 | 3.96 | 4.10 | .54 | .52 | 6.81 | 8.19 | 7.15 | 6.52 | 4.55 | 8.74 | 4.27 | 3.79 | 59.14 |
| 1888 | 3.43 | .67 | .80 | 1.68 | 5.29 | 7.52 | 1.12 | 9.06 | 4.58 | 9.76 | 4.40 | .72 | 49.03 |
| 1889 | .76 | 1.07 | 2.31 | 2.40 | 2.56 | 14.22 | 7.87 | 5.63 | 6.75 | 3.96 | 3.97 | 3.69 | 55.19 |
| 1890 | 2.84 | 3.27 | 3.03 | .20 | 5.72 | 8.98 | 3.20 | 3.43 | 9.53 | 4.72 | 7.83 | .30 | 53.05 |
| 1891 | 2.07 | 2.77 | .80 | .33 | 2.30 | 4.61 | 11.23 | 3.74 | 5.92 | 5.10 | 4.08 | 1.89 | 44.84 |
| 1892 | 1.46 | .10 | 1.40 | .00 | 2.88 | 15.05 | 10.68 | 5.57 | 6.00 | 4.76 | 2.31 | 1.38 | 51.59 |
| 1893 | .65 | 1.44 | 1.28 | .20 | 2.96 | 4.87 | 9.87 | 10.21 | 12.04 | 2.10 | 1.45 | 5.09 | 52.16 |
| 1894 | 4.21 | .39 | 1.56 | .17 | 6.38 | 8.60 | 7.75 | 2.52 | 3.65 | 1.84 | 5.59 | 1.07 | 43.73 |
| 1896 | .64 | .79 | 2.01 | .16 | 1.85 | 12.78 | 15.56 | 3.01 | 3.27 | 8.08 | 11.05 | 2.30 | 61.50 |
| 1897 | 2.18 | .14 | .05 | 2.76 | 3.31 | 14.56 | 4.34 | 9.88 | 3.40 | 17.50 | 7.91 | .45 | 66.48 |
| 1898 | .80 | 1.26 | .39 | 5.76 | 3.75 | 10.58 | 5.94 | 9.73 | 9.06 | 8.62 | 5.74 | 1.22 | 62.85 |
| 1899 | 5.54 | 1.37 | .27 | .48 | .27 | 13.62 | 2.74 | 3.66 | 4.83 | 3.16 | 5.73 | 1.28 | 42.95 |
| Mean | 2.57 | 1.47 | 1.24 | 1.36 | 3.99 | 8.74 | 6.95 | 5.80 | 6.41 | 6.70 | 5.19 | 2.05 | 52.47 |
| Greatest | 5.54 | 4.10 | 3.99 | 5.76 | 10.95 | 15.05 | 15.56 | 10.21 | 13.24 | 17.50 | 11.05 | 5.09 | 66.48 |
| Least | .46 | .10 | .05 | .00 | .27 | 3.39 | 1.12 | 2.52 | 3.27 | 1.84 | 1.45 | .30 | 33.68 |

[1] 24-year period.

CHIMAX, GUATEMALA.

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1897 | 3.09 | 2.22 | 2.94 | 3.98 | 8.97 | 10.87 | 6.84 | 8.78 | 9.09 | 9.58 | 11.22 | 6.01 | 83.57 |
| 1898 | 3.54 | 3.11 | 1.89 | 4.45 | 14.65 | 11.06 | 10.35 | 12.64 | 9.80 | 27.09 | 8.58 | 9.68 | 116.84 |
| 1899 | 8.05 | 3.41 | 8.69 | 4.47 | 4.28 | 7.05 | 8.97 | 8.33 | 10.40 | 19.81 | 8.88 | 5.13 | 97.47 |
| 1900 | 5.53 | 8.22 | 6.04 | 6.59 | 9.80 | 7.48 | 14.99 | 6.48 | 12.63 | 13.63 | 9.92 | 7.76 | 109.10 |
| 1901 | 6.51 | 4.06 | 4.41 | 1.15 | 4.62 | 17.80 | 10.35 | 7.54 | 10.08 | 16.53 | 5.07 | 9.19 | 97.31 |
| 1902 | 2.77 | 2.60 | 2.89 | 7.28 | 8.95 | 17.74 | 8.22 | 6.10 | 4.22 | 10.66 | 4.66 | 3.41 | 79.50 |
| 1903 | 3.36 | 4.83 | 5.72 | 5.05 | 5.05 | 9.72 | 11.16 | 10.11 | 14.01 | 12.56 | 10.18 | 7.27 | 99.02 |
| 1904 | 8.14 | 5.66 | 5.59 | 9.11 | 13.01 | 17.77 | 13.34 | 9.80 | 8.25 | 14.16 | 5.93 | 6.11 | 116.87 |
| 1905 | 7.71 | 6.44 | 3.32 | 7.02 | 6.51 | 10.55 | 8.60 | 6.92 | 9.34 | 7.83 | 5.73 | 8.42 | 88.39 |
| 1906 | 5.95 | 3.02 | 8.50 | 2.48 | 5.24 | 11.67 | 5.68 | 7.03 | 6.92 | 14.30 | 7.51 | 8.36 | 88.66 |
| 1907 | 4.86 | 4.89 | 1.05 | 2.38 | 6.71 | 4.62 | 9.72 | 6.17 | 9.79 | 7.67 | 4.57 | 6.43 | 68.86 |
| 1908 | 5.53 | 7.93 | 2.26 | 1.08 | 7.70 | 11.72 | 8.59 | 7.35 | 11.07 | 21.02 | 9.44 | 6.19 | 99.88 |
| 1909 | 6.55 | 3.09 | 3.39 | 6.98 | 2.83 | 6.20 | 7.02 | 8.09 | 15.40 | 20.07 | 4.80 | 2.35 | 87.27 |
| 1910 | 10.49 | 6.44 | 6.04 | 7.17 | 7.15 | 14.27 | 7.52 | 7.32 | 11.77 | 11.49 | 3.43 | 5.49 | 98.58 |
| 1911 | 6.93 | 2.96 | .55 | 1.73 | 14.42 | 18.78 | 8.78 | 4.59 | 8.43 | 8.51 | 19.26 | 3.40 | 98.34 |
| 1912 | 8.08 | 1.52 | 5.21 | 1.20 | 8.26 | 12.73 | 8.63 | 5.28 | 6.28 | 9.00 | 17.76 | 8.01 | 91.96 |
| 1913 | 7.94 | 1.02 | 10.22 | 7.21 | 13.92 | 10.67 | 10.51 | 8.31 | 10.65 | 10.26 | 7.24 | 6.49 | 104.41 |
| Mean [2] | 6.00 | 4.22 | 4.54 | 4.28 | 8.28 | 11.85 | 10.11 | 7.96 | 9.88 | 13.54 | 8.63 | 6.68 | 95.97 |
| Greatest | 10.49 | 8.22 | 10.22 | 9.11 | 14.65 | 18.78 | 14.99 | 12.64 | 15.40 | 27.09 | 19.26 | 9.68 | 116.87 |
| Least | 2.77 | 1.02 | .55 | 1.08 | 2.83 | 4.62 | 5.68 | 4.59 | 4.22 | 7.67 | 3.43 | 2.85 | 68.86 |

[2] 20-year period.

EL PORVENIR, GUATEMALA.

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1898 | 1.14 | 5.86 | 3.66 | 17.99 | 30.98 | 29.17 | 17.28 | 35.47 | 32.40 | 18.50 | 8.28 | 4.49 | 205.22 |
| 1899 | 8.66 | 1.22 | 6.85 | 13.94 | 12.40 | 23.03 | 16.02 | 17.24 | 23.23 | 24.41 | 10.59 | 1.02 | 158.61 |
| 1900 | 2.87 | 6.57 | 5.55 | 15.87 | 25.51 | 27.40 | 41.18 | 9.02 | 21.02 | 31.61 | 9.13 | 2.76 | 198.49 |
| 1901 | 2.44 | 4.33 | 1.69 | 5.83 | 24.06 | 38.90 | 43.54 | 24.49 | 26.77 | 15.24 | 7.48 | 4.80 | 199.57 |
| 1903 | 1.81 | 2.83 | 3.35 | 7.28 | 17.16 | 36.26 | 17.28 | 27.80 | 22.99 | 19.17 | 5.87 | 2.60 | 164.40 |
| 1904 | .79 | 1.40 | 11.89 | 19.09 | 32.28 | 31.42 | 15.67 | 23.35 | 16.87 | 17.54 | 9.82 | 3.66 | 183.78 |
| 1905 | 4.21 | .14 | 16.59 | 16.34 | 26.93 | 22.36 | 11.59 | 14.02 | 19.33 | 23.74 | 6.48 | 4.43 | 166.16 |
| 1906 | 4.98 | 3.37 | 3.92 | 5.02 | 13.19 | 32.76 | 17.64 | 15.94 | 17.28 | 27.56 | 13.70 | 2.79 | 158.16 |
| 1907 | .23 | 9.51 | 4.19 | 4.17 | 16.28 | 22.26 | 17.46 | 11.93 | 12.20 | 12.46 | 11.91 | 2.30 | 124.89 |

TABLE 8.—*Monthly and annual precipitation (in inches)*—Continued.

EL PORVENIR, GUATEMALA—Continued.

| Year. | January. | February. | March. | April. | May. | June. | July. | August. | September. | October. | November. | December. | Annual. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1908 | 1.40 | 1.24 | 3.46 | 7.24 | 20.14 | 24.74 | 12.20 | 14.25 | 32.95 | 30.47 | 7.44 | 0.45 | 155.98 |
| 1909 | 1.65 | 1.06 | 1.71 | 14.76 | 17.20 | 25.18 | 18.01 | 31.67 | 35.06 | 21.20 | 1.69 | 2.99 | 172.18 |
| 1910 | .45 | .37 | 5.76 | 6.17 | 27.74 | 24.78 | 15.98 | 20.91 | 23.42 | 22.18 | 7.70 | 1.14 | 156.60 |
| 1911 | 3.86 | 1.26 | 2.95 | 7.99 | 23.82 | 26.12 | 12.15 | 22.78 | 18.90 | 19.02 | 7.11 | 1.10 | 147.06 |
| 1912 | 1.08 | .73 | .26 | 4.80 | 16.06 | 25.79 | 9.74 | 15.04 | 24.61 | 24.15 | 10.33 | 3.85 | 136.44 |
| Mean | 2.54 | 2.85 | 5.13 | 10.46 | 21.70 | 27.87 | 18.98 | 20.28 | 23.29 | 21.88 | 8.40 | 2.74 | 166.12 |
| Greatest | 8.66 | 9.51 | 16.59 | 19.09 | 32.28 | 38.90 | 43.54 | 35.47 | 35.06 | 31.61 | .1370 | 4.80 | 205.29 |
| Least | .22 | .14 | .26 | 4.17 | 12.40 | 22.26 | 9.74 | 9.02 | 12.20 | 12.46 | 1.69 | .45 | 124.82 |

GUATEMALA, GUATEMALA.

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1850 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 7.01 | 17.87 | 1.38 | 3.23 | ..... |
| 1851 | .39 | 0.00 | 1.42 | 0.43 | 9.06 | 14.21 | 22.64 | 11.81 | 13.23 | ..... | ..... | ..... | ..... |
| 1856 | .12 | .00 | .23 | .47 | 5.35 | 13.98 | 11.74 | 12.17 | 10.99 | 6.85 | .55 | .53 | 62.98 |
| 1857 | .18 | .02 | .58 | 2.09 | 5.31 | 13.27 | 11.72 | 11.11 | 5.39 | 3.53 | 1.08 | .24 | 54.52 |
| 1858 | .50 | .02 | 1.66 | 1.87 | 5.76 | 12.84 | 11.24 | 4.49 | 8.38 | 3.24 | .07 | .10 | 50.17 |
| 1859 | .39 | .13 | 1.94 | 2.30 | 8.06 | 10.07 | 5.95 | 8.81 | 11.42 | 9.48 | .51 | .19 | 59.25 |
| 1860 | .15 | .07 | .10 | 2.03 | 3.26 | 6.41 | 7.02 | 9.26 | 9.36 | 9.82 | .10 | .74 | 48.32 |
| 1861 | .12 | .15 | .52 | 6.87 | 8.15 | 12.86 | 13.14 | 9.13 | 9.50 | 9.96 | .63 | .66 | 71.69 |
| 1862 | .48 | .07 | .00 | .00 | 3.31 | 12.57 | 8.22 | 11.06 | 8.01 | 4.02 | .11 | .13 | 47.98 |
| 1863 | .37 | .03 | 1.52 | .36 | 7.30 | 10.34 | 6.46 | 3.90 | 5.93 | 3.81 | 2.59 | .14 | 42.75 |
| 1864 | .18 | .75 | .04 | 1.09 | 2.57 | 11.67 | 5.35 | 8.10 | 9.56 | 9.54 | .51 | .41 | 49.77 |
| 1879 | ..... | ..... | .28 | 2.53 | 3.02 | 10.72 | 15.56 | 10.52 | 9.66 | 7.37 | .43 | .14 | ..... |
| 1880 | .37 | .22 | .06 | .79 | 5.68 | 9.95 | 5.40 | 9.20 | 9.08 | 6.26 | 2.35 | .07 | 49.43 |
| 1881 | 1.66 | .03 | .01 | .46 | 2.84 | 10.26 | 7.29 | 9.60 | 10.70 | 8.93 | 1.41 | .00 | 53.19 |
| 1882 | .01 | .14 | .00 | 2.24 | 3.07 | 6.68 | 2.86 | 11.46 | 14.06 | 8.24 | .72 | .00 | 49.48 |
| 1883 | .00 | .67 | .91 | .43 | 2.95 | 12.76 | 9.57 | 4.41 | 11.33 | 7.40 | 1.77 | .16 | 52.36 |
| 1885 | .00 | .32 | .00 | .51 | 4.65 | 9.45 | 4.88 | 6.22 | 5.51 | 7.44 | 2.64 | .00 | 41.62 |
| 1892 | .00 | .08 | .47 | .00 | 14.65 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| 1894 | .00 | .00 | .08 | 2.72 | 7.80 | 10.35 | 2.83 | 3.31 | 8.42 | 4.61 | 1.26 | .16 | 41.54 |
| 1895 | .00 | .04 | .00 | .00 | 5.75 | 8.07 | 3.54 | 8.31 | 8.54 | 3.35 | .47 | .04 | 38.11 |
| 1896 | .04 | .00 | 3.35 | .12 | 4.53 | 11.06 | 9.76 | 1.22 | 11.46 | 3.94 | .71 | .08 | 46.27 |
| 1897 | .08 | .00 | .12 | .16 | 8.31 | 15.47 | 4.88 | 11.97 | 5.83 | 6.34 | .28 | .04 | 53.48 |
| 1898 | 1.50 | .05 | .01 | .15 | 6.47 | 13.88 | 9.90 | 10.10 | 9.50 | 4.47 | .21 | .35 | 56.59 |
| 1899 | .50 | .04 | .07 | .64 | 3.32 | 6.89 | 7.06 | 6.05 | 5.95 | 8.90 | 2.52 | .02 | 41.96 |
| 1901 | .06 | .57 | .06 | .28 | 4.27 | 11.39 | 13.83 | 7.70 | 10.96 | 3.20 | .03 | .23 | 52.58 |
| 1902 | .24 | .04 | .04 | 2.24 | 7.47 | 10.57 | 4.81 | 2.96 | 9.51 | 13.10 | 1.74 | .12 | 52.84 |
| 1909 | ..... | ..... | ..... | ..... | 1.60 | 10.33 | 9.85 | 10.40 | 11.57 | 5.15 | .33 | .00 | ..... |
| 1910 | .00 | .00 | .00 | .15 | 5.19 | 11.59 | 6.84 | 7.61 | 9.16 | 4.43 | .00 | .63 | 45.60 |
| 1911 | .65 | .00 | .00 | 3.30 | 12.09 | 12.94 | 3.34 | 7.61 | 9.77 | 6.38 | 2.83 | .10 | 59.01 |
| 1912 | .00 | .00 | .00 | .83 | 1.45 | 6.69 | 2.02 | 3.28 | 5.83 | 4.89 | .00 | .00 | 24.99 |
| 1913 | .50 | .18 | .25 | .34 | 16.85 | 6.05 | 3.69 | 3.50 | 7.56 | 3.54 | .00 | .68 | 44.04 |
| Mean | .30 | .13 | .47 | 1.22 | 6.00 | 10.84 | 7.98 | 7.77 | 9.11 | 6.76 | .94 | .32 | 51.84 |
| Greatest | 1.66 | .75 | 3.35 | 6.87 | 16.85 | 15.47 | 22.64 | 12.17 | 14.06 | 17.87 | 2.83 | 3.23 | 71.69 |
| Least | .00 | .00 | .00 | .00 | 1.45 | 6.41 | 2.02 | 1.22 | 5.39 | 3.20 | .00 | .00 | 24.99 |

LIVINGSTON, GUATEMALA.

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1909 | ..... | ..... | ..... | ..... | ..... | ..... | 19.32 | 10.66 | 19.76 | 14.64 | 16.75 | 12.68 | ..... |
| 1910 | 25.52 | 12.58 | 6.27 | 4.99 | 15.99 | 13.44 | 20.07 | 22.00 | 20.33 | 11.18 | 9.02 | 14.11 | 174.50 |
| 1911 | 31.15 | 8.87 | 13.39 | 10.14 | 23.60 | 23.54 | 31.30 | 29.87 | 44.13 | 11.53 | 17.18 | 17.12 | 261.82 |
| 1912 | 20.19 | 1.06 | 5.91 | 2.26 | 16.95 | 16.40 | 22.66 | 41.95 | 12.41 | 15.19 | 9.40 | 16.04 | 180.42 |
| Mean | 25.62 | 7.50 | 8.53 | 5.80 | 18.85 | 17.80 | 23.34 | 26.11 | 24.16 | 13.14 | 13.09 | 14.98 | 198.92 |

QUEZALTENANGO, GUATEMALA.

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1895 | 0.00 | 0.00 | 0.00 | 0.24 | 5.43 | 8.11 | 2.36 | 3.07 | 6.37 | 4.10 | 0.28 | 0.20 | 30.16 |
| 1896 | .00 | .00 | .00 | .08 | 3.17 | 4.39 | 5.47 | 2.86 | 2.98 | 1.67 | 1.10 | .50 | 22.22 |
| 1897 | .00 | .05 | .08 | .95 | 6.91 | 6.47 | 3.02 | 6.17 | 3.22 | 4.00 | .32 | .00 | 31.19 |
| 1913 | .15 | .50 | .00 | 1.10 | 5.00 | 5.77 | 2.17 | 3.35 | 6.43 | 4.39 | .17 | .14 | 29.17 |
| Mean | .04 | .14 | .02 | .59 | 5.13 | 6.18 | 3.26 | 3.86 | 4.75 | 3.54 | .47 | .21 | 28.19 |

SETAL, GUATEMALA

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1900 | 15.75 | 12.20 | 12.72 | 10.35 | 21.22 | 18.45 | 19.45 | 16.06 | 24.76 | 24.06 | 12.72 | 30.24 | 218.05 |
| 1901 | 17.13 | 7.20 | 11.93 | 9.21 | 9.45 | 36.85 | 20.71 | 20.55 | 26.69 | 39.72 | 13.54 | 28.74 | 241.72 |
| 1902 | 11.57 | 7.83 | 5.71 | 16.26 | 17.99 | 31.34 | 24.21 | 18.35 | 10.08 | 35.82 | 22.87 | 13.42 | 215.46 |
| 1903 | 10.43 | 18.62 | 18.19 | 8.38 | 17.32 | 25.28 | 23.58 | 22.60 | 30.04 | 49.92 | 17.40 | 21.82 | 263.61 |
| 1904 | 28.82 | 11.06 | 6.89 | 15.87 | 19.72 | 22.84 | 19.13 | 15.71 | 16.97 | 24.72 | 18.62 | 15.56 | 215.90 |
| 1905 | 19.88 | 15.35 | 8.94 | 14.25 | 12.05 | 20.43 | 18.35 | 12.80 | 18.98 | 15.79 | 10.59 | 32.80 | 200.21 |
| 1906 | 20.08 | 9.64 | 29.17 | 5.04 | 7.76 | 14.57 | 13.35 | 16.93 | 13.58 | 23.11 | 17.99 | 13.27 | 184.49 |
| 1907 | 9.53 | 12.76 | 1.30 | 1.38 | 9.17 | 10.16 | 16.85 | 18.94 | 15.20 | 14.45 | 11.42 | 23.42 | 144.58 |
| 1908 | 9.49 | 15.03 | 6.97 | 3.74 | 4.09 | 17.05 | 2.24 | 9.09 | 22.05 | 45.67 | 19.57 | 13.78 | 169.37 |
| 1909 | 10.28 | 10.12 | 1.65 | 9.53 | 2.68 | 10.51 | 9.06 | 13.39 | 15.67 | 41.73 | 9.65 | 4.72 | 138.99 |
| 1910 | 15.90 | 20.30 | 9.41 | 6.46 | 5.35 | 21.18 | 7.32 | 8.94 | 27.48 | 17.01 | 10.28 | 8.46 | 158.09 |
| 1911 | 14.78 | 5.43 | .55 | 4.45 | 22.09 | 36.89 | 13.31 | 15.24 | 19.61 | 15.55 | 32.91 | 9.33 | 190.14 |
| 1912 | 14.49 | 8.07 | 3.35 | .79 | 9.45 | 12.09 | 13.66 | 18.54 | 16.34 | 17.36 | 25.43 | 14.45 | 154.02 |
| 1913 | 19.72 | 3.03 | 21.54 | 18.66 | 18.46 | 18.27 | 18.86 | 6.18 | 17.48 | 24.84 | 20.67 | 10.31 | 198.02 |
| Mean [3] | 15.24 | 11.30 | 9.96 | 8.54 | 11.46 | 20.98 | 18.11 | 15.43 | 19.84 | 28.46 | 18.54 | 15.28 | 193.14 |
| Greatest | 28.82 | 20.30 | 29.17 | 18.66 | 22.09 | 36.89 | 24.21 | 22.60 | 30.04 | 49.92 | 32.91 | 32.80 | 263.61 |
| Least | 9.49 | 3.03 | .55 | .79 | 2.68 | 10.16 | 2.24 | 6.18 | 10.08 | 14.45 | 9.65 | 4.72 | 138.99 |

[3] 17-year period.

TABLE 8.—*Monthly and annual precipitation (in inches)*—Continued.

SAN JUANCITO, HONDURAS.

| Year. | January. | February. | March. | April. | May. | June. | July. | August. | September. | October. | November. | December. | Annual. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1912 | ..... | ..... | ..... | ..... | ..... | ..... | 10.00 | 6.57 | 7.30 | 7.79 | 2.38 | 3.54 | ..... |
| 1913 | 3.15 | 0.88 | 1.46 | 4.80 | 9.74 | 13.37 | 8.19 | 5.74 | 10.67 | 10.31 | 4.35 | 1.89 | 74.55 |
| 1914 | .92 | 1.52 | 1.20 | 2.64 | 3.45 | 7.07 | 3.75 | 2.27 | 5.81 | 5.72 | 3.98 | 2.22 | 40.55 |
| 1915 | .83 | .72 | 5.87 | 2.51 | 4.86 | 14.49 | 7.22 | 5.94 | 7.97 | 6.76 | 13.17 | 1.72 | 72.06 |
| 1916 | 2.76 | 1.10 | 1.46 | 2.60 | 8.82 | 9.97 | 12.64 | 15.52 | 8.23 | 8.47 | 4.33 | 1.83 | 77.73 |
| 1917 | 2.04 | .35 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Mean | 1.94 | .91 | 2.50 | 3.14 | 6.72 | 11.22 | 8.36 | 7.21 | 8.00 | 7.81 | 5.64 | 2.24 | 65.69 |

SAN SALVADOR, SALVADOR.

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1912 | 0.00 | 0.00 | 0.00 | 0.33 | 4.11 | 7.83 | 10.56 | 14.17 | 5.83 | 12.98 | 0.21 | 2.09 | 58.11 |
| 1913 | .00 | .00 | .28 | 3.87 | 5.68 | 9.38 | 9.01 | 13.11 | 11.31 | 17.99 | 1.93 | 1.34 | 73.90 |
| 1914 | .32 | .18 | .00 | .73 | 10.09 | 13.27 | 9.38 | 9.92 | 15.82 | 8.86 | 1.42 | .00 | 69.99 |
| 1915 | .30 | .00 | .02 | 2.19 | 9.49 | 12.31 | 14.58 | 12.11 | 9.20 | 3.53 | 1.31 | 4.64 | 69.68 |
| 1916 | 1.17 | .00 | .00 | 2.12 | 4.48 | 11.73 | 7.64 | 8.73 | 10.18 | 7.76 | 4.71 | .22 | 58.47 |
| 1917 | .00 | .02 | .45 | .40 | 2.69 | 14.02 | 16.24 | 12.14 | 11.55 | 12.89 | .58 | .00 | 69.98 |
| 1918 | .41 | 1.39 | 3.14 | 11.12 | 12.86 | 13.84 | 12.44 | 9.74 | 7.24 | 9.60 | 1.54 | .11 | 83.43 |
| 1919 | .50 | .54 | .00 | 2.20 | 3.45 | 11.47 | 13.81 | 14.17 | 10.78 | 12.09 | 1.63 | .16 | 70.80 |
| 1920 | .06 | .00 | .01 | .00 | 7.39 | 10.66 | 9.94 | 12.39 | 10.44 | 6.09 | 1.29 | .07 | 58.34 |
| Mean [4] | .17 | .21 | .50 | 1.96 | 6.69 | 11.13 | 12.11 | 11.72 | 11.03 | 10.37 | 1.79 | .59 | 68.27 |
| Greatest | 1.17 | 1.39 | 3.14 | 11.12 | 12.86 | 14.02 | 15.24 | 14.17 | 15.82 | 17.99 | 4.71 | 4.64 | 83.43 |
| Least | .00 | .00 | .00 | .00 | 2.69 | 7.83 | 7.64 | 8.73 | 5.83 | 3.53 | .21 | .00 | 58.11 |

[4] 23-year period.

BLUEFIELDS, NICARAGUA.

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1883 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 3.42 | 8.13 | 12.13 | 17.00 | ..... |
| 1884 | 10.25 | 6.39 | 3.21 | 2.06 | 2.67 | 8.01 | 17.06 | 16.40 | 5.82 | 4.99 | 9.71 | 11.15 | 97.72 |
| 1885 | 1.96 | 1.60 | 2.66 | 2.87 | 5.89 | 13.37 | 19.82 | 11.75 | 8.07 | 2.69 | 7.70 | 3.15 | 81.53 |
| 1886 | 7.28 | 3.94 | 1.63 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| 1908 | 7.90 | 9.43 | 6.85 | 4.85 | 13.89 | 27.10 | 31.66 | ..... | ..... | 19.90 | 12.56 | 22.27 | ..... |
| 1909 | 7.31 | 8.82 | 3.26 | 2.68 | 6.02 | 21.39 | 32.29 | 16.21 | 7.76 | 20.41 | 14.92 | 17.81 | 159.38 |
| 1910 | 24.46 | 11.41 | 4.05 | ..... | 11.93 | 14.62 | 42.05 | 19.90 | 18.63 | ..... | ..... | ..... | ..... |
| Mean | 9.86 | 6.93 | 3.61 | 3.12 | 8.08 | 17.00 | 28.58 | 16.07 | 8.74 | 11.22 | 11.40 | 14.28 | 138.89 |
| Greatest | 24.46 | 11.41 | 6.85 | 4.85 | 13.89 | 27.10 | 42.05 | 19.90 | 18.63 | 20.41 | 14.92 | 22.27 | 159.38 |
| Least | 1.96 | 1.60 | 1.63 | 2.06 | 2.67 | 8.01 | 17.06 | 11.75 | 3.42 | 2.69 | 7.70 | 3.15 | 81.53 |

GREYTOWN, NICARAGUA.

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1890 | 26.80 | 6.36 | 5.93 | 18.11 | 4.93 | 46.84 | 52.55 | 35.72 | 8.14 | 24.36 | 25.55 | 41.65 | 296.94 |
| 1891 | 20.30 | 2.57 | 1.95 | 10.40 | 13.78 | 26.95 | 23.57 | 19.49 | 14.16 | 20.21 | 28.15 | 32.74 | 214.27 |
| 1892 | 28.57 | 11.38 | 4.98 | 18.38 | 50.88 | 13.42 | 38.96 | 23.63 | 11.47 | 27.95 | 36.93 | 24.65 | 291.20 |
| 1893 | 17.70 | 7.53 | 3.93 | 9.99 | 2.77 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| 1898 | 19.44 | 25.17 | 10.16 | 7.82 | 9.37 | 19.52 | 24.63 | 16.38 | 7.24 | 12.50 | 32.35 | 17.08 | 201.64 |
| 1899 | 23.48 | 11.69 | 8.33 | 9.09 | 21.24 | 20.97 | 39.62 | 29.50 | 36.95 | 12.44 | 40.36 | 32.25 | 285.93 |
| 1900 | 21.20 | 10.72 | 7.47 | 4.62 | 22.03 | 11.43 | 27.13 | 38.96 | 26.45 | 22.44 | 55.38 | 18.24 | 266.10 |
| Mean | 22.50 | 10.77 | 6.11 | 11.20 | 17.86 | 23.19 | 34.41 | 27.28 | 17.40 | 19.98 | 36.45 | 27.76 | 254.91 |
| Greatest | 28.57 | 25.17 | 10.16 | 18.38 | 50.88 | 46.84 | 52.55 | 38.96 | 36.95 | 27.95 | 55.38 | 41.65 | 296.94 |
| Least | 17.70 | 2.57 | 1.95 | 4.62 | 2.77 | 11.43 | 23.57 | 16.38 | 7.24 | 12.44 | 25.55 | 17.08 | 201.64 |

RIVAS, NICARAGUA.

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1880 | 0.00 | 0.00 | 0.00 | 0.00 | 10.23 | 12.58 | 3.62 | 10.48 | 7.95 | 13.83 | 5.02 | 0.67 | 64.38 |
| 1881 | .00 | .00 | .00 | .12 | 5.20 | 13.17 | 8.88 | 6.96 | 7.42 | 24.67 | 10.88 | 1.91 | 79.21 |
| 1882 | .00 | .13 | .00 | .00 | 4.26 | 9.80 | 4.04 | 6.25 | 7.65 | 23.38 | 4.20 | 1.61 | 61.32 |
| 1883 | .28 | .00 | .00 | .14 | 1.00 | 8.07 | 4.87 | 4.34 | 5.78 | 18.25 | 5.70 | 1.34 | 49.77 |
| 1884 | .59 | .09 | .00 | 2.03 | 2.80 | 10.43 | 4.98 | 3.84 | 4.48 | 15.83 | 7.43 | 2.24 | 54.74 |
| 1885 | .04 | .00 | .00 | .00 | 1.78 | 7.27 | 4.81 | 2.76 | 5.40 | 7.88 | 4.36 | .29 | 34.59 |
| 1886 | .23 | .20 | .00 | .17 | 13.00 | 7.87 | 15.00 | 20.80 | 15.30 | 10.40 | 3.75 | .49 | 87.21 |
| 1887 | .90 | .81 | .00 | .00 | 9.17 | 8.18 | 4.10 | 5.03 | 19.42 | 22.47 | 2.50 | 2.31 | 74.89 |
| 1888 | 1.83 | .04 | .00 | .00 | 7.12 | 8.50 | 4.18 | 5.00 | 9.80 | 16.80 | 1.11 | 1.13 | 55.51 |
| 1889 | .00 | .19 | .07 | 1.71 | 11.34 | 11.64 | 7.48 | 12.95 | 9.80 | 24.13 | 3.38 | 1.67 | 84.36 |
| 1890 | .49 | .11 | .94 | .00 | 2.63 | 4.56 | 4.73 | 3.78 | 2.77 | 9.68 | 1.30 | .82 | 31.81 |
| 1891 | .00 | .00 | .00 | .78 | .75 | 24.58 | 4.38 | 4.21 | 12.42 | 14.90 | 2.34 | 1.67 | 66.03 |
| 1892 | .19 | .00 | .00 | .00 | 13.30 | 9.80 | 9.19 | 7.48 | 12.22 | 21.26 | 4.40 | .43 | 78.27 |
| 1893 | .06 | .39 | .00 | .11 | 20.03 | 21.14 | 13.22 | 18.70 | 14.00 | 13.56 | 2.44 | 2.48 | 106.13 |
| 1894 | 2.12 | .24 | .08 | .00 | 7.76 | 6.32 | 3.64 | 4.57 | 4.33 | 14.62 | 3.21 | .43 | 47.32 |
| 1895 | .00 | .08 | .19 | .39 | 8.11 | 11.02 | 5.25 | 3.42 | 8.01 | 8.97 | 2.04 | .20 | 47.68 |
| 1896 | .40 | .08 | .00 | T. | 3.26 | 6.23 | 7.43 | 6.57 | 7.40 | 7.42 | 8.62 | .39 | 47.80 |
| 1897 | .33 | T. | 1.04 | .00 | 21.30 | 24.34 | 6.41 | 12.10 | 17.63 | 33.85 | 5.15 | 1.28 | 123.43 |
| 1898 | 1.07 | .12 | .10 | .00 | 16.17 | 18.95 | 13.65 | 11.85 | 13.99 | 20.83 | 8.19 | 3.14 | 108.06 |
| 1899 | .85 | 1.70 | .65 | .00 | 1.62 | 7.53 | 10.69 | 9.26 | 5.15 | 20.39 | 9.06 | .92 | 67.82 |
| 1900 | .19 | .02 | .11 | .02 | 11.19 | 16.38 | 10.61 | 9.16 | 22.58 | 21.93 | 1.18 | 1.31 | 94.68 |
| Mean | .46 | .20 | .15 | .23 | 8.19 | 11.83 | 7.20 | 8.07 | 10.17 | 17.38 | 4.58 | 1.27 | 69.76 |
| Greatest | 2.12 | 1.70 | 1.04 | 2.03 | 21.30 | 24.58 | 15.00 | 20.80 | 22.58 | 33.85 | 10.88 | 3.14 | 123.43 |
| Least | .00 | .00 | .00 | .00 | .75 | 4.56 | 3.62 | 2.76 | 2.77 | 7.42 | 1.11 | .20 | 31.81 |

SAN ANTONIO, NICARAGUA.

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1895 | 0.00 | 0.00 | 0.00 | 0.00 | 7.98 | 6.29 | 3.36 | 5.07 | 21.68 | 21.71 | 3.42 | 0.32 | 69.83 |
| 1896 | .00 | .00 | .00 | .20 | 12.20 | 10.50 | 7.54 | 4.71 | 13.39 | 11.22 | 4.76 | .98 | 65.50 |
| 1897 | .00 | .00 | 1.26 | .59 | 18.23 | 14.53 | 6.81 | 13.86 | 10.94 | 31.06 | .98 | .00 | 98.26 |
| 1898 | .24 | .00 | .00 | .00 | 16.00 | 11.60 | 8.37 | 14.85 | 16.71 | 7.60 | 5.64 | .04 | 81.05 |
| 1899 | .00 | .44 | .00 | .00 | 2.12 | 9.82 | 8.08 | 9.60 | 5.50 | 26.85 | 4.81 | .00 | 67.22 |
| 1900 | .00 | .00 | .55 | 1.02 | 6.05 | 22.46 | 18.81 | 6.80 | 13.69 | 24.45 | 1.85 | .00 | 95.68 |
| Mean | .04 | .07 | .30 | .30 | 10.43 | 12.53 | 8.83 | 9.15 | 13.65 | 20.48 | 3.58 | .22 | 79.58 |

TABLE 8.—*Monthly and annual precipitation (in inches)*—Continued.

LIMON, COSTA RICA.

| Year. | January. | February. | March. | April. | May. | June. | July. | August. | September. | October. | November. | December. | Annual. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1894 | ..... | ..... | 6.30 | 9.68 | 7.16 | 9.25 | 33.94 | 15.55 | 6.46 | 4.76 | 14.37 | 14.72 | ..... |
| 1895 | 15.63 | 2.44 | 5.71 | 6.69 | 10.87 | 7.72 | 25.32 | 16.46 | 8.11 | 7.36 | 7.52 | 41.06 | 154.89 |
| 1898 | [5] 20.83 | 2.16 | 11.38 | 9.37 | 15.55 | 6.89 | 7.76 | [5] 3.90 | [5] 1.42 | 2.99 | 13.62 | 6.22 | 102.09 |
| 1899 | [5] 11.38 | [5] 14.76 | 5.28 | 8.03 | 14.53 | [5] 7.72 | 29.29 | [5] 13.70 | [5] 7.99 | 3.94 | 11.22 | 13.15 | 140.99 |
| 1900 | [5] 7.05 | 8.31 | 9.57 | 10.28 | 3.58 | 3.82 | 8.27 | [5] 25.24 | 10.91 | 3.98 | 8.07 | 13.74 | 112.82 |
| 1901 | 11.97 | 2.83 | 8.42 | 7.60 | 3.78 | 1.30 | 5.08 | 9.29 | 2.20 | 6.42 | 10.16 | 11.18 | 80.23 |
| 1902 | 19.76 | 8.19 | 6.73 | 21.06 | 11.85 | 10.39 | 16.10 | 11.85 | 7.40 | 5.63 | 18.03 | 16.42 | 153.41 |
| 1903 | 15.39 | ..... | 3.07 | 12.28 | .67 | 2.68 | 9.17 | 1.85 | 1.02 | ..... | ..... | ..... | ..... |
| Mean | 14.57 | 6.45 | 7.06 | 10.62 | 8.50 | 6.22 | 16.87 | 12.23 | 5.69 | 5.01 | 11.86 | 16.64 | 121.72 |
| Greatest | 20.83 | 14.76 | 11.38 | 21.06 | 15.55 | 10.39 | 33.94 | 25.24 | 10.91 | 7.36 | 18.03 | 41.06 | 154.89 |
| Least | 7.05 | 2.16 | 3.07 | 6.69 | .67 | 1.30 | 5.08 | 1.85 | 1.02 | 2.99 | 7.52 | 11.18 | 80.23 |

[5] Interpolated.

SAN CARLOS, COSTA RICA.

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1898 | 9.29 | 10.00 | 4.88 | 5.04 | 11.46 | 13.78 | 16.54 | 13.03 | 13.23 | 13.42 | 15.29 | 6.14 | 132.09 |
| 1899 | 7.72 | 10.74 | 1.81 | 4.13 | 12.24 | 11.73 | 22.83 | 9.88 | 9.72 | 15.94 | 20.86 | 15.03 | 142.63 |
| 1900 | 8.03 | 3.78 | 3.11 | 5.43 | 14.96 | 7.95 | 17.13 | 13.50 | 12.87 | 19.88 | 21.69 | 10.24 | 138.57 |
| 1901 | 11.83 | 2.64 | 3.78 | 4.33 | 3.62 | 17.05 | 13.07 | 17.32 | 10.12 | 22.09 | 21.46 | 6.89 | 134.22 |
| 1902 | 12.40 | 7.13 | 1.97 | 10.35 | 15.75 | 11.22 | 16.77 | 18.11 | 16.93 | 12.01 | 11.85 | 8.66 | 143.15 |
| 1903 | 6.93 | 2.56 | 13.74 | 3.07 | 10.24 | 17.60 | 12.64 | 13.62 | 12.28 | 19.21 | [5] 23.62 | 41.42 | 176.93 |
| Mean | 9.37 | 6.14 | 4.88 | 5.39 | 11.38 | 13.23 | 16.50 | 14.25 | 12.52 | 17.09 | 19.13 | 14.73 | 144.61 |
| Greatest | 12.40 | 10.74 | 13.74 | 10.35 | 15.75 | 17.60 | 22.83 | 18.11 | 16.93 | 22.09 | [5] 23.62 | 41.42 | 176.93 |
| Least | 6.93 | 2.56 | 1.81 | 3.07 | 3.62 | 7.95 | 12.64 | 9.88 | 9.72 | 12.01 | 11.85 | 6.14 | 132.09 |

[5] Interpolated.

SAN JOSÉ, COSTA RICA.

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1866 | 1.30 | 0.28 | 0.00 | 1.14 | 5.47 | 4.84 | 12.60 | 6.14 | 10.79 | 9.84 | 6.73 | 4.80 | 63.93 |
| 1867 | 3.86 | 2.21 | .38 | 3.86 | 8.23 | 8.11 | 8.43 | 7.48 | 12.36 | 8.39 | 9.61 | .55 | 73.47 |
| 1868 | .00 | .00 | 7.13 | .01 | 3.27 | 5.91 | 4.02 | 5.12 | 8.82 | 15.47 | 5.67 | .67 | 56.09 |
| 1869 | .28 | .00 | .28 | 1.10 | 7.95 | 8.58 | 5.91 | 5.20 | 15.47 | 11.06 | 3.07 | 4.02 | 62.92 |
| 1870 | .04 | .24 | 1.22 | .67 | 13.11 | 10.87 | 9.45 | 11.18 | 9.45 | 10.32 | 7.24 | 1.30 | 75.09 |
| 1871 | 1.10 | .12 | .32 | .51 | 11.42 | 7.99 | 14.33 | 12.09 | 9.65 | 13.11 | 4.49 | .43 | 75.56 |
| 1872 | .12 | .12 | .59 | 1.97 | 9.61 | 10.04 | 7.56 | 14.88 | 15.63 | 19.84 | 5.59 | .83 | 86.78 |
| 1873 | 2.52 | .00 | .12 | 2.80 | 2.52 | 8.07 | 5.71 | 3.35 | 15.24 | 10.32 | 4.76 | .43 | 55.84 |
| 1874 | 1.81 | .04 | .79 | 2.36 | 13.23 | 6.57 | 6.38 | 7.13 | 12.56 | 7.52 | 1.65 | .79 | 60.83 |
| 1875 | .00 | .00 | .00 | 1.10 | 9.92 | 7.09 | 3.66 | 11.57 | 10.98 | 13.35 | .83 | 1.26 | 59.76 |
| 1876 | .55 | .00 | .43 | .24 | 9.72 | 9.33 | 6.02 | 7.56 | 8.11 | 4.61 | 2.76 | 1.10 | 50.43 |
| 1877 | .55 | .00 | .00 | .00 | 9.45 | 6.57 | 8.78 | 6.26 | 10.20 | 3.74 | 4.76 | 3.11 | 53.42 |
| 1878 | .00 | .00 | 1.50 | 1.97 | 3.59 | 7.36 | 8.07 | 5.87 | 12.99 | 9.37 | 8.78 | .79 | 60.29 |
| 1879 | .51 | .00 | 1.77 | 7.56 | 8.66 | 12.99 | 18.11 | 11.14 | 13.82 | 9.09 | 2.40 | .32 | 86.37 |
| 1880 | .32 | .00 | .00 | .59 | 10.00 | 8.27 | 4.09 | 17.17 | 6.50 | 10.94 | 3.62 | .00 | 61.50 |
| 1884 | .00 | .00 | .08 | .32 | .43 | 2.44 | .59 | .67 | 4.41 | 1.89 | 7.44 | 1.22 | 19.49 |
| 1885 | .00 | .00 | .00 | 1.85 | 5.98 | 3.07 | 7.84 | 3.86 | 15.59 | 12.87 | 16.22 | 2.32 | 69.60 |
| 1886 | .00 | .00 | 2.05 | 8.98 | 15.55 | 16.85 | 20.59 | 19.61 | 22.91 | 28.67 | 16.81 | 2.28 | 154.30 |
| 1887 | .00 | .00 | .67 | .28 | 9.96 | 14.16 | 5.61 | 9.40 | 11.24 | 13.16 | 4.93 | 2.07 | 71.48 |
| 1888 | .63 | .71 | .00 | .55 | 7.07 | 10.24 | 5.49 | 5.54 | 15.71 | 10.39 | 2.01 | .87 | 59.21 |
| 1889 | .01 | .08 | 2.91 | 2.41 | 14.57 | 8.08 | 6.06 | 10.76 | 16.89 | 20.48 | 2.45 | .48 | 85.18 |
| 1890 | .87 | .08 | .75 | 2.52 | 10.08 | 11.65 | 15.67 | 10.55 | 8.35 | 7.99 | 2.56 | .71 | 71.78 |
| 1891 | .03 | .01 | .05 | .74 | 4.26 | 7.74 | 8.00 | 9.84 | 12.30 | 15.48 | 5.57 | 1.16 | 65.18 |
| 1892 | .00 | .00 | .13 | .07 | 12.17 | 15.06 | 8.70 | 13.75 | 14.84 | 21.36 | 5.03 | .44 | 91.55 |
| 1893 | .04 | .00 | .02 | .47 | 8.73 | 15.28 | 13.90 | 13.76 | 20.75 | 14.93 | 7.08 | 2.94 | 97.90 |
| 1894 | .04 | .00 | .00 | .99 | 8.00 | 7.83 | 3.90 | 9.76 | 12.80 | 8.54 | 5.82 | .55 | 58.23 |
| 1895 | .15 | .35 | .04 | .86 | 15.12 | 12.36 | 4.76 | 9.92 | 11.50 | 7.32 | 8.35 | 6.02 | 76.75 |
| 1896 | 2.13 | .00 | .04 | 5.20 | 6.57 | 6.50 | 8.23 | 4.88 | 8.15 | 7.87 | 12.16 | 3.03 | 64.76 |
| 1897 | .20 | .00 | .28 | 1.54 | 12.20 | 8.98 | 4.33 | 15.75 | 12.05 | 14.92 | 3.11 | 1.61 | 74.97 |
| 1898 | .35 | .00 | .28 | 1.30 | 8.58 | 15.59 | 8.90 | 13.39 | 13.62 | 11.69 | 4.65 | .08 | 78.43 |
| 1901 | .15 | .34 | .96 | .03 | 5.07 | 11.16 | 15.67 | 13.45 | 17.00 | 18.82 | 7.19 | .99 | 90.83 |
| 1902 | .20 | .68 | .98 | 1.63 | 13.19 | 7.07 | 6.43 | 4.55 | 1.02 | 7.41 | 3.72 | .09 | 46.97 |
| 1903 | .19 | .01 | .11 | .98 | 14.60 | 13.42 | 8.38 | 15.43 | 9.83 | 11.83 | 2.57 | 5.25 | 82.60 |
| 1904 | 2.48 | .68 | 2.16 | 3.09 | 9.22 | 13.98 | 5.12 | 7.11 | 7.99 | 7.99 | ..... | ..... | ..... |
| Mean | .60 | .18 | .77 | 1.76 | 9.04 | 9.53 | 8.27 | 9.53 | 12.04 | 11.78 | 5.75 | 1.59 | 70.84 |
| Greatest | 3.86 | 2.21 | 7.13 | 8.98 | 15.55 | 16.85 | 20.59 | 19.61 | 22.91 | 28.67 | 16.81 | 6.02 | 154.30 |
| Least | .00 | .00 | .00 | .00 | .43 | 2.44 | .59 | .67 | 4.41 | 1.89 | .83 | .00 | 19.49 |

SARAPIQUI, COSTA RICA.

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1898 | 14.72 | 11.81 | 10.94 | 14.76 | 17.52 | 22.68 | 16.81 | 17.48 | 19.41 | 19.29 | 21.73 | 5.16 | 192.31 |
| 1899 | 8.42 | 12.36 | 3.23 | 5.24 | 15.47 | 18.54 | 22.76 | 16.61 | 9.96 | 22.84 | 24.76 | 20.04 | 180.23 |
| 1900 | 8.31 | 8.31 | 4.02 | 10.55 | 20.34 | 25.35 | 22.76 | 8.86 | 15.71 | 27.76 | 27.40 | 11.81 | 191.18 |
| 1901 | 27.28 | 2.24 | 5.90 | 9.57 | 6.46 | 16.61 | 15.79 | 17.72 | 15.90 | 31.54 | 52.20 | 27.13 | 228.34 |
| 1902 | 42.44 | 16.61 | 5.63 | 17.76 | 27.40 | 22.68 | 21.89 | 30.63 | 18.50 | 7.36 | 23.62 | 28.94 | 263.46 |
| 1903 | 16.22 | 4.41 | 8.50 | 6.14 | 29.25 | 20.75 | 16.18 | ..... | 5.79 | 27.16 | ..... | ..... | ..... |
| Mean | 19.56 | 9.29 | 6.37 | 10.67 | 19.41 | 21.10 | 19.36 | 18.26 | 14.21 | 22.66 | 29.94 | 18.62 | 209.45 |
| Greatest | 42.44 | 16.61 | 10.94 | 17.76 | 29.25 | 25.35 | 22.76 | 30.63 | 19.41 | 31.54 | 52.20 | 28.94 | 263.46 |
| Least | 8.31 | 2.24 | 3.23 | 5.24 | 6.46 | 16.61 | 15.79 | 8.86 | 5.79 | 7.36 | 21.73 | 11.81 | 180.23 |

TABLE 8.—*Monthly and annual precipitation (in inches)*—Continued.

ANCON-BALBOA HEIGHTS,[6] CANAL ZONE.

| Year. | January. | February. | March. | April. | May. | June. | July. | August. | September. | October. | November. | December. | Annual. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1906 | 0.43 | 0.33 | 0.05 | 7.77 | 10.68 | 8.57 | 9.01 | 6.43 | 4.83 | 4.35 | 13.57 | 5.52 | 71.54 |
| 1907 | .29 | .04 | T. | T. | 4.44 | 12.64 | 4.23 | 7.46 | 11.14 | 9.26 | 10.51 | 3.46 | 63.52 |
| 1908 | .12 | .24 | .03 | 1.37 | 7.64 | 4.28 | 6.83 | 11.48 | 5.93 | 8.79 | 9.12 | 4.16 | 59.99 |
| 1909 | 2.90 | 2.90 | .18 | 2.92 | 9.10 | 9.90 | 9.01 | 6.84 | 3.86 | 8.77 | 15.14 | 12.39 | 83.91 |
| 1910 | 1.22 | .43 | 1.83 | 3.71 | 9.89 | 8.82 | 9.26 | 12.00 | 4.84 | 8.86 | 4.29 | 10.63 | 75.78 |
| 1911 | .83 | 2.75 | .26 | 6.34 | 11.04 | 3.40 | 5.78 | 7.21 | 6.03 | 10.90 | 7.57 | 1.99 | 64.10 |
| 1912 | T. | .08 | .01 | 2.68 | 10.71 | 5.80 | 10.25 | 6.33 | 8.38 | 17.89 | 6.38 | 3.27 | 71.73 |
| 1913 | .63 | .22 | .43 | .03 | 8.27 | 8.15 | 4.85 | 8.20 | 11.43 | 8.30 | 10.63 | 4.84 | 65.98 |
| 1914 | .32 | .02 | T. | 4.80 | 6.98 | 7.28 | 4.32 | 6.09 | 9.60 | 6.44 | 10.35 | 8.28 | 64.48 |
| 1915 | 2.12 | 2.96 | T. | 5.37 | 6.42 | 2.85 | 6.93 | 15.24 | 3.69 | 10.49 | 7.05 | 3.60 | 66.72 |
| 1916 | 1.41 | 1.48 | .89 | 2.84 | 12.59 | 4.39 | 10.13 | 10.53 | 8.02 | 10.17 | 8.77 | 5.86 | 77.08 |
| 1917 | .13 | .19 | .02 | 2.24 | 5.75 | 7.35 | 10.17 | 7.42 | 11.53 | 6.14 | 13.77 | 4.09 | 68.80 |
| 1918 | 1.78 | T. | 1.25 | 4.52 | 6.75 | 5.20 | 5.13 | 3.84 | 7.03 | 9.16 | 9.61 | .55 | 54.82 |
| 1919 | .28 | T. | T. | 6.43 | 5.21 | 8.93 | 4.75 | 5.82 | 10.84 | 12.11 | 4.97 | 1.81 | 61.15 |
| 1920 | .03 | .00 | .02 | 3.60 | 4.38 | 9.87 | 6.18 | 12.22 | 9.14 | 6.48 | 19.22 | 1.94 | 73.08 |
| 1921 | .88 | 2.37 | 2.98 | 1.19 | 8.60 | 7.86 | 8.07 | 9.51 | 3.27 | 13.86 | 7.11 | 5.19 | 70.89 |
| Mean [6] | .95 | .84 | .72 | 3.00 | 8.24 | 7.46 | 7.64 | 7.97 | 7.75 | 10.32 | 10.35 | 4.12 | 69.36 |
| Greatest [6] | 5.61 | 2.96 | 5.71 | 7.77 | 12.59 | 13.78 | 15.82 | 15.24 | 15.06 | 20.27 | 19.22 | 12.39 | 91.42 |
| Least [6] | .00 | .00 | .00 | .00 | 4.38 | 2.85 | 3.35 | 3.84 | 3.27 | 4.35 | 4.29 | .55 | 45.58 |

[6] 24-year period. Station moved to Balboa Heights October 1, 1914.

GAMBOA, CANAL ZONE.

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1897 | 0.94 | 0.20 | 0.00 | 3.23 | 17.44 | 12.64 | 9.10 | 17.20 | 18.82 | 12.80 | 5.91 | 9.05 | 107.33 |
| 1898 | 2.76 | .12 | .00 | 1.42 | 5.32 | 4.65 | 18.43 | 20.16 | 4.10 | 8.70 | 14.57 | 2.40 | 82.63 |
| 1899 | 5.00 | 1.73 | 1.34 | 1.42 | 8.54 | 8.78 | 9.45 | 10.95 | 13.46 | 7.95 | 8.70 | 2.68 | 80.00 |
| 1900 | 1.01 | .16 | .13 | 3.21 | 6.76 | 12.15 | 13.45 | 8.92 | 9.24 | 12.11 | 10.67 | .79 | 78.60 |
| 1901 | .35 | .24 | .20 | .79 | 10.87 | 7.68 | 9.21 | 13.87 | 8.43 | 14.14 | 19.11 | 6.70 | 91.59 |
| 1902 | 13.40 | .16 | 4.37 | 9.49 | 10.92 | 6.30 | 6.26 | 8.43 | 8.90 | 12.91 | 14.38 | 2.24 | 97.76 |
| 1903 | .67 | .12 | .32 | .41 | 11.35 | 11.03 | 13.45 | 12.87 | 9.30 | 14.18 | 11.94 | 13.83 | 99.47 |
| 1904 | 3.35 | 2.27 | 1.91 | 12.00 | 6.71 | 9.71 | 5.01 | 7.01 | 12.43 | 9.51 | 12.01 | 4.54 | 86.46 |
| 1905 | 2.74 | .05 | .41 | 2.94 | 10.72 | 8.59 | 5.77 | 11.58 | 6.65 | 14.85 | 5.49 | 6.68 | 76.47 |
| 1906 | 1.37 | .47 | .16 | 6.44 | 6.22 | 8.04 | 18.71 | 11.33 | 9.42 | 5.08 | 15.92 | 11.68 | 94.84 |
| 1907 | .28 | .29 | .35 | .44 | 5.98 | 9.68 | 7.92 | 12.69 | 14.01 | 13.02 | 10.43 | 2.96 | 78.05 |
| 1908 | .19 | .04 | .50 | 2.65 | 15.29 | 6.15 | 11.43 | 11.84 | 6.28 | 8.90 | 7.32 | 6.92 | 77.51 |
| 1909 | 2.77 | 4.07 | .56 | 5.55 | 15.37 | 9.55 | 11.59 | 7.03 | 7.90 | 16.98 | 28.41 | 12.33 | 122.11 |
| 1910 | 1.24 | 1.80 | 3.12 | 3.85 | 11.09 | 12.08 | 17.00 | 10.66 | 12.24 | 12.90 | 16.90 | 13.11 | 115.99 |
| 1911 | .11 | .71 | .38 | 4.01 | 14.53 | 6.98 | 7.26 | 7.68 | 5.20 | 12.75 | 10.09 | .97 | 70.67 |
| 1912 | .06 | 1.11 | .10 | .77 | 7.94 | 11.64 | 14.27 | 16.64 | 12.75 | 13.60 | 6.56 | 3.63 | 89.07 |
| 1913 | 2.65 | .68 | .08 | 1.07 | 15.13 | 8.02 | 8.06 | 16.45 | 9.48 | 8.71 | 14.13 | 1.82 | 86.28 |
| 1914 | .64 | .23 | .02 | 1.38 | 10.28 | 17.78 | 3.91 | 7.97 | 11.50 | 9.79 | 7.70 | 6.15 | 77.35 |
| 1915 | 1.74 | 2.75 | .02 | 7.09 | 5.10 | 9.01 | 8.03 | 4.51 | 9.91 | 15.93 | 8.37 | 7.00 | 79.46 |
| 1916 | 2.16 | 1.52 | .89 | 6.68 | 12.25 | 8.44 | 9.59 | 12.22 | 11.37 | 13.46 | 9.84 | 4.75 | 93.17 |
| 1917 | .09 | .30 | .26 | 3.96 | 8.14 | 7.82 | 17.75 | 12.62 | 9.93 | 11.21 | 22.05 | 8.31 | 102.44 |
| 1918 | 3.07 | .07 | .54 | 3.16 | 11.45 | 10.12 | 6.51 | 8.59 | 7.60 | 17.25 | 5.86 | 1.25 | 75.47 |
| 1919 | .55 | .21 | .03 | 7.02 | 5.82 | 6.02 | 6.70 | 7.37 | 9.39 | 11.72 | 3.50 | 3.69 | 62.02 |
| 1920 | .05 | .10 | .21 | 1.48 | 7.59 | 7.48 | 14.71 | 8.97 | 12.68 | 24.93 | 13.63 | 3.05 | 94.88 |
| 1921 | .09 | 5.39 | .09 | 1.16 | 5.39 | 12.81 | 11.33 | 15.68 | 10.48 | 11.83 | 5.96 | 4.42 | 86.13 |
| Mean [7] | 1.64 | 0.95 | 0.69 | 3.57 | 10.50 | 9.70 | 10.26 | 11.80 | 10.44 | 13.05 | 11.79 | 6.40 | 90.79 |
| Greatest [7] | 13.40 | 5.39 | 4.37 | 12.00 | 20.47 | 19.45 | 18.71 | 20.16 | 18.82 | 24.93 | 28.41 | 20.87 | 136.19 |
| Least [7] | .00 | .00 | .00 | .00 | 3.35 | 2.89 | 3.27 | 4.51 | 4.10 | 5.08 | 3.50 | .79 | 62.02 |

[7] 39-year period.

COLON, PANAMA.

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1897 | 3.42 | 0.04 | 0.28 | 3.47 | 16.34 | 18.82 | 14.06 | 17.24 | 17.20 | 5.82 | 22.16 | 18.90 | 138.03 |
| 1898 | 5.04 | .35 | 1.58 | 4.72 | 12.83 | 16.38 | 21.89 | 10.91 | 10.24 | 11.38 | 12.23 | 7.95 | 115.55 |
| 1899 | 6.93 | 6.49 | 1.26 | .43 | 13.90 | 6.41 | 27.68 | 14.80 | 16.55 | 15.09 | 14.49 | 9.04 | 133.07 |
| 1900 | 6.06 | .33 | 1.06 | .75 | 12.25 | 11.65 | 16.81 | 17.00 | 9.37 | 16.33 | 20.28 | 4.13 | 116.02 |
| 1901 | 1.28 | .94 | 1.67 | 1.50 | 6.19 | 11.05 | 9.94 | 12.51 | 11.88 | 12.65 | 32.73 | 5.41 | 107.75 |
| 1902 | 19.20 | .59 | 2.33 | 4.46 | 11.10 | 7.00 | 16.81 | 5.78 | 11.06 | 14.24 | 12.18 | 7.10 | 111.85 |
| 1903 | 1.00 | .35 | .96 | 1.65 | 14.74 | 10.91 | 16.73 | 14.25 | 11.61 | 10.04 | 28.30 | 15.75 | 126.29 |
| 1904 | 7.02 | .47 | 1.65 | 11.46 | 11.06 | 15.83 | 14.21 | 11.14 | 13.86 | 8.14 | 26.33 | 7.02 | 128.19 |
| 1905 | 8.42 | 1.13 | .62 | 2.28 | 22.96 | 8.10 | 9.07 | 15.01 | 6.80 | 13.45 | 17.92 | 9.50 | 115.26 |
| 1906 | 1.47 | 1.14 | 1.42 | 4.23 | 10.07 | 14.09 | 19.23 | 18.31 | 12.48 | 13.34 | 26.64 | 15.64 | 138.06 |
| 1907 | 2.47 | 1.37 | 2.16 | 1.06 | 6.33 | 16.89 | 17.86 | 18.89 | 11.72 | 21.99 | 15.37 | 9.36 | 125.47 |
| 1908 | 3.84 | 1.08 | 3.53 | 1.27 | 22.49 | 10.53 | 14.76 | 16.89 | 11.57 | 10.96 | 31.72 | 9.07 | 137.71 |
| 1909 | 10.61 | 1.92 | 1.85 | 3.56 | 7.21 | 17.49 | 12.83 | 15.42 | 16.33 | 19.31 | 42.50 | 34.38 | 183.41 |
| 1910 | 2.94 | 3.58 | 5.46 | 3.30 | 12.09 | 13.63 | 21.07 | 14.93 | 12.05 | 15.65 | 30.04 | 15.20 | 149.94 |
| 1911 | .99 | 1.81 | 1.41 | 3.06 | 17.13 | 15.58 | 14.58 | 11.60 | 11.62 | 16.53 | 15.81 | 2.63 | 112.75 |
| 1912 | .28 | 1.81 | .66 | .75 | 12.03 | 15.90 | 13.13 | 9.87 | 12.23 | 17.65 | 21.81 | 11.47 | 117.59 |
| 1913 | 6.71 | 1.75 | .79 | 2.69 | 22.60 | 11.81 | 15.13 | 17.91 | 9.90 | 18.63 | 16.75 | 6.55 | 131.22 |
| 1914 | 1.35 | 1.32 | .91 | 4.12 | 17.76 | 16.30 | 10.74 | 16.01 | 14.80 | 22.16 | 18.35 | 8.88 | 132.70 |
| 1915 | 3.41 | 12.37 | 1.71 | 10.42 | 7.75 | 16.01 | 20.72 | 12.89 | 13.85 | 21.86 | 22.33 | 9.45 | 152.77 |
| 1916 | 2.33 | 1.96 | 2.68 | 6.25 | 9.38 | 14.28 | 10.44 | 8.34 | 10.41 | 17.59 | 14.08 | 5.71 | 103.45 |
| 1917 | 1.10 | .45 | .76 | 1.87 | 12.11 | 14.37 | 13.58 | 15.79 | 17.67 | 7.87 | 20.49 | 11.66 | 117.72 |
| 1918 | 3.28 | .67 | .41 | 5.34 | 19.26 | 8.56 | 10.36 | 18.85 | 15.34 | 27.07 | 14.23 | 1.90 | 125.27 |
| 1919 | 1.82 | .36 | .61 | 10.95 | 6.95 | 12.08 | 13.60 | 6.77 | 11.74 | 21.94 | 6.63 | 7.37 | 100.82 |
| 1920 | .51 | .54 | 1.08 | 1.72 | 5.48 | 13.29 | 17.58 | 23.04 | 6.81 | 17.16 | 21.27 | 2.06 | 110.54 |
| 1921 | 1.31 | 1.63 | .98 | 7.43 | 13.61 | 15.18 | 10.49 | 18.45 | 11.21 | 8.27 | 19.96 | 6.50 | 115.02 |
| Mean [8] | 3.69 | 1.62 | 1.57 | 4.35 | 12.48 | 13.39 | 15.89 | 15.07 | 12.51 | 14.94 | 21.02 | 11.32 | 127.85 |
| Greatest [8] | 19.20 | 12.37 | 9.17 | 21.73 | 23.00 | 22.00 | 27.68 | 25.43 | 22.99 | 30.32 | 42.50 | 34.38 | 183.41 |
| Least [8] | .28 | .04 | .02 | .43 | 1.63 | 6.41 | 9.07 | 5.78 | 5.35 | 5.83 | 6.63 | .94 | 86.54 |

[8] 51-year period.

TABLE 8.—*Monthly and annual precipitation (in inches)*—Continued.

PORTO BELLO, PANAMA.

| Year. | January. | February. | March. | April. | May. | June. | July. | August. | September. | October. | November. | December. | Annual. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1906 | 2.76 | 1.52 | 0.93 | 5.98 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| 1908 | ..... | ..... | ..... | ..... | 21.03 | 16.99 | 9.98 | 16.98 | 8.59 | 7.28 | 41.73 | 25.72 | ..... |
| 1909 | 20.90 | 6.82 | 3.56 | 12.56 | 9.69 | 17.70 | 26.33 | 13.83 | 13.99 | 8.70 | 45.03 | 58.17 | 237.28 |
| 1910 | 14.05 | 5.89 | 6.32 | 7.14 | 9.30 | 15.25 | 22.80 | 20.71 | 13.15 | 9.54 | 23.08 | 22.89 | 170.12 |
| 1911 | .84 | 6.90 | 2.38 | 6.60 | 19.25 | 18.04 | 14.48 | 22.56 | 17.55 | 13.78 | 24.40 | 2.16 | 148.94 |
| 1912 | .67 | 1.64 | .60 | .54 | 16.65 | 19.77 | 24.21 | 14.15 | 15.03 | 17.01 | 25.82 | 11.52 | 147.61 |
| 1913 | 5.84 | 2.03 | 1.17 | 2.34 | 30.51 | 9.00 | 20.83 | 25.35 | 11.34 | 18.85 | 33.47 | 10.46 | 171.19 |
| 1914 | 2.38 | 2.20 | .98 | 2.06 | 16.22 | 15.08 | 7.90 | 21.30 | ..... | ..... | ..... | ..... | ..... |
| 1919 | 4.31 | 1.58 | 1.18 | 30.21 | 13.86 | 10.04 | 24.23 | 17.76 | 14.37 | 15.71 | 7.74 | 6.46 | 147.45 |
| 1920 | 2.52 | 1.61 | 1.07 | 2.67 | 5.05 | 20.17 | 16.02 | 27.45 | 10.02 | 27.42 | 14.59 | 8.02 | 136.61 |
| 1921 | 4.21 | 5.30 | 2.57 | 6.61 | 17.46 | 18.77 | 13.59 | 30.32 | 10.65 | 4.84 | 31.34 | 9.53 | 155.09 |
| Mean | 5.85 | 3.54 | 2.08 | 7.73 | 15.90 | 16.08 | 18.04 | 21.04 | 12.74 | 13.68 | 26.48 | 16.84 | 160.00 |
| Greatest | 20.90 | 6.90 | 6.32 | 30.21 | 30.51 | 20.17 | 26.33 | 30.32 | 17.55 | 27.42 | 45.03 | 58.17 | 237.28 |
| Least | .67 | 1.52 | .60 | .54 | 5.05 | 9.00 | 7.90 | 13.83 | 8.59 | 7.28 | 7.74 | 2.16 | 136.61 |

For several other stations there are interesting data relative to greatest monthly and annual precipitation; these are combined with those preceding into Table 9.

TABLE 9.—*Greatest amount of precipitation—Monthly and annual (inches).*

| Stations. | Length of record (years). | Greatest monthly amount. | Month. | Year. | Greatest annual amount. | Year. |
|---|---|---|---|---|---|---|
| Belize | 13 | 30.17 | Oct. | 1913 | 130.39 | 1911 |
| Corozal | 16 | 17.50 | Oct. | 1897 | 66.48 | 1897 |
| Chimax | 17 | 27.09 | Oct. | 1898 | 116.84 | 1898 |
| El Porvenir | 14 | 43.54 | July | 1901 | 205.22 | 1898 |
| Guatemala | 29 | 22.64 | July | 1851 | 71.69 | 1861 |
| Livingston | 3 | 44.13 | Sept. | 1911 | 261.82 | 1911 |
| Magdalena | 7 | 11.28 | June | 1917 | 51.65 | 1916 |
| Quezaltenango | 4 | 8.11 | June | 1895 | 31.19 | 1897 |
| Samac | 17 | 51.93 | Nov. | 1911 | 220.99 | 1913 |
| San Francisco Miramar | 12 | 49.00 | Sept. | 1909 | 238.78 | 1909 |
| San Luis | 11 | 40.61 | Sept. | 1916 | 234.10 | 1909 |
| Setal | 14 | 49.92 | Oct. | 1903 | 263.61 | 1903 |
| San Salvador | 9 | 17.99 | Oct. | 1913 | 83.43 | 1918 |
| Santa Tecla | 8 | 24.94 | Aug. | 1886 | 87.49 | 1892 |
| Bluefields | 5 | 45.02 | July | 1910 | 159.38 | 1909 |
| Granada | 10 | 30.79 | June | 1897 | 93.62 | 1897 |
| Greytown | 6 | 55.38 | Nov. | 1900 | 296.94 | 1890 |
| Masaya | 12 | 23.56 | Oct. | 1887 | 78.78 | 1889 |
| Rivas | 21 | 33.85 | Oct. | 1897 | 123.43 | 1897 |
| Sabalos | 3 | 20.71 | July | 1898 | 124.25 | 1898 |
| San Antonio | 6 | 31.06 | Oct. | 1897 | 98.26 | 1897 |
| Boca Banana | 6 | 33.66 | Dec. | 1903 | 139.17 | 1902 |
| Limon | 7 | 41.06 | Dec. | 1895 | 154.89 | 1895 |
| Peralta | 6 | 49.45 | Dec. | 1903 | 175.63 | 1903 |
| San Carlos | 6 | 41.42 | Dec. | 1903 | 176.93 | 1903 |
| San Francisco Guadelupe. | 6 | 19.65 | Sept. | 1901 | 97.40 | 1901 |
| San Jose | 34 | 28.67 | Oct. | 1886 | 154.30 | 1886 |
| Sarapiqui | 6 | 52.20 | Nov. | 1901 | 263.46 | 1902 |
| Siquirres | 5 | 27.56 | Dec. | 1903 | 150.43 | 1902 |
| Balboa Heights | 24 | 20.27 | Oct. | 1900 | 91.42 | 1901 |
| Gamboa | 39 | 28.41 | Nov. | 1909 | 136.19 | 1887 |
| Colon | 51 | 42.50 | Nov. | 1909 | 183.41 | 1909 |
| Porto Bello | 10 | 45.03 | Nov. | 1909 | 237.28 | 1909 |

The few data available as to maximum amounts of precipitation in 24 hours are shown in Table 10.

TABLE 10.—*Maximum precipitation in 24 hours.*[1]

| Stations. | Amount. | Date. |
|---|---|---|
| | *Inches.* | |
| Ancon | 7.23 | May 12-13, 1912 |
| Gamboa | 6.56 | Dec. 2- 3, 1906 |
| Gatun | 10.48 | Do. |
| Colon | 8.53 | Do. |
| Porto Bello | 10.86 | Dec. 28-29, 1909 |

[1] For the years 1906-1921, except Porto Bello, 1909-1914 and 1918-1921.

In the wet season the number of days with rain show a maximum generally above 20 and exceeding 25 at some stations; in the *verano* the number is reduced to below 10 at many of the eastern stations, while there are practically none at some of the stations on the Pacific coast.

TABLE 11.—*Average number of days with precipitation.*

| Stations. | Length of record (years). | January. | February. | March. | April. | May. | June. | July. | August. | September. | October. | November. | December. | Annual. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Belize [1] | 12 | 14 | 7 | 6 | 6 | 8 | 15 | 18 | 18 | 17 | 15 | 16 | 14 | 154 |
| Chimax | 8 | 15 | 11 | 9 | 10 | 6 | 23 | 25 | 24 | 23 | 24 | 19 | 17 | 206 |
| Guatemala | 16 | 4 | 2 | 3 | 5 | 15 | 23 | 21 | 21 | 22 | 18 | 7 | 4 | 145 |
| Las Mercedes | 7 | 3 | 5 | 5 | 10 | 24 | 27 | 27 | 26 | 26 | 26 | 15 | 4 | 198 |
| Quezaltenango | 3 | 0 | 0 | 1 | 3 | 14 | 21 | 17 | 16 | 19 | 17 | 7 | 2 | 117 |
| San Diego | 6 | 1 | 2 | 6 | 9 | 17 | 23 | 12 | 15 | 17 | 16 | 8 | 3 | 129 |
| San Francisco Miramar | 9 | 3 | 2 | 5 | 9 | 18 | 23 | 21 | 20 | 23 | 21 | 12 | 3 | 160 |
| La Laguna | 5 | 0 | 0 | 3 | 6 | 12 | 17 | 21 | 18 | 16 | 10 | 2 | 0 | 105 |
| Mirasol | 5 | 0 | 1 | 4 | 6 | 13 | 14 | 20 | 19 | 17 | 10 | 4 | 0 | 108 |
| San Salvador | 14 | 1 | 1 | 3 | 6 | 15 | 22 | 24 | 23 | 22 | 16 | 7 | 2 | 142 |
| Santa Lucia | 5 | 1 | 0 | 3 | 7 | 15 | 17 | 22 | 19 | 16 | 10 | 4 | 0 | 114 |
| Santa Tecla | 4 | 0 | 1 | 1 | 6 | 16 | 19 | 21 | 24 | 21 | 16 | 6 | 2 | 133 |
| Bluefields | 5 | 18 | 10 | 13 | 14 | 12 | 25 | 31 | 25 | 23 | 18 | 22 | 12 | 223 |
| Masaya | 10 | 1 | 1 | 0 | 1 | 10 | 17 | 16 | 14 | 17 | 18 | 7 | 3 | 105 |
| Rivas | 21 | 4 | 3 | 0 | 1 | 8 | 17 | 13 | 15 | 19 | 22 | 12 | 6 | 120 |
| Boca Banana | 7 | 20 | 15 | 17 | 20 | 17 | 15 | 21 | 21 | 15 | 15 | 19 | 20 | 215 |
| La Verbena | 6 | 2 | 2 | 2 | 4 | 16 | 22 | 20 | 18 | 21 | 24 | 16 | 6 | 153 |
| Limon | 7 | 19 | 11 | 17 | 14 | 14 | 14 | 18 | 21 | 10 | 11 | 15 | 18 | 182 |
| Peralta | 6 | 17 | 10 | 3 | 14 | 10 | 20 | 20 | 24 | 20 | 18 | 22 | 17 | 195 |
| San Carlos | 6 | 18 | 10 | 11 | 19 | 18 | 21 | 26 | 24 | 22 | 29 | 29 | 18 | 245 |
| San Francisco Guadelupe | 9 | 5 | 1 | 2 | 7 | 17 | 22 | 22 | 20 | 22 | 23 | 16 | 6 | 163 |
| San Jose | 14 | 3 | 1 | 2 | 7 | 19 | 22 | 23 | 24 | 24 | 25 | 14 | 6 | 170 |
| Sarapiqui | 5 | 23 | 18 | 14 | 20 | 21 | 20 | 27 | 25 | 24 | 28 | 27 | 21 | 268 |
| Siquirres | 4 | 15 | 8 | 10 | 17 | 16 | 19 | 19 | 15 | 12 | 11 | 20 | 9 | 171 |
| Tres Rios | 13 | 2 | 2 | 2 | 5 | 14 | 18 | 16 | 18 | 20 | 22 | 20 | 6 | 145 |
| Turrialba | 7 | 16 | 10 | 11 | 12 | 19 | 16 | 22 | 18 | 17 | 18 | 18 | 18 | 195 |
| Ancon [1] | 8 | 7 | 5 | 2 | 8 | 20 | 20 | 21 | 20 | 19 | 21 | 23 | 16 | 182 |
| Culebra [1] | 7 | 9 | 7 | 4 | 9 | 21 | 22 | 23 | 24 | 23 | 24 | 25 | 16 | 207 |
| Colon [1] | 6 | 16 | 15 | 16 | 16 | 23 | 24 | 25 | 25 | 24 | 24 | 26 | 23 | 257 |

[1] With 0.01 inch or more. Other values based on 0.1 millimeter (0.004 inch) or more.

*Thunderstorms.*—In the Canal Zone region thunderstorms are frequent in the months from May to November, occurring usually on more than 15 days in each month, while in the remainder of the year they are rare. The same march in frequency is found at San José with the average number of days only 5 for a maximum.

TABLE 12.—*Average number of days with thunderstorm.*

| Stations. | Length of record (years). | January. | February. | March. | April. | May. | June. | July. | August. | September. | October. | November. | December. | Annual. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| San Jose | 11 | 0 | 0 | 1 | 1 | 5 | 3 | 5 | 4 | 5 | 2 | 1 | 0 | 27 |
| Ancon | 8 | 1 | 1 | 0 | 5 | 16 | 18 | 16 | 22 | 19 | 17 | 14 | 5 | 134 |
| Culebra | 7 | 1 | 1 | 0 | 3 | 17 | 20 | 20 | 21 | 19 | 19 | 12 | 4 | 137 |
| Colon | 6 | 1 | 0 | 0 | 2 | 13 | 18 | 17 | 16 | 17 | 14 | 10 | 4 | 112 |

*Relative humidity.*—This element shows a march very similar to that of rainfall. Means range from nearly 90 per cent in the southern region in the wet season to about 70 per cent on the Pacific slope in the dry season. The annual means for these regions are 85 and 75 per cent respectively.

TABLE 13.—*Monthly and annual mean relative humidity (per cent).*

| Stations. | Length of record (years). | January. | February. | March. | April. | May. | June. | July. | August. | September. | October. | November. | December. | Annual. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Belize | 12 | 83 | 79 | 77 | 76 | 78 | 78 | 77 | 78 | 83 | 81 | 84 | 83 | 80 |
| Chimax [1] | 5 | 87 | 84 | 83 | 81 | 85 | 87 | 88 | 87 | 88 | 90 | 89 | 88 | 86 |
| Guatemala [2] | 21 | 72 | 69 | 69 | 70 | 74 | 84 | 82 | 81 | 84 | 82 | 79 | 74 | 77 |
| San Salvador [2] | 9 | 69 | 68 | 68 | 70 | 80 | 85 | 82 | 82 | 85 | 79 | 77 | 72 | 76 |
| Greytown | 3 | 86 | 85 | 81 | 79 | 84 | 87 | 88 | 86 | 86 | 86 | 89 | 87 | 85 |
| San Jose [2] | 12 | 76 | 72 | 72 | 73 | 81 | 84 | 83 | 84 | 86 | 87 | 80 | 80 | 80 |
| Ancon [3] | 8 | 77 | 75 | 72 | 76 | 85 | 87 | 86 | 86 | 87 | 88 | 88 | 83 | 82 |
| Culebra [3] | 7 | 80 | 78 | 75 | 78 | 86 | 88 | 88 | 89 | 88 | 89 | 90 | 86 | 85 |
| Colon [3] | 6 | 80 | 80 | 77 | 80 | 86 | 87 | 87 | 87 | 87 | 87 | 89 | 85 | 84 |

[1] Mean from observations at 6 a. m., noon, and 6 p. m.
[2] Mean from observations at 7 a. m., 2 p. m., and 9 p. m.
[3] Mean from bihourly readings.
Mean for Belize and Greytown probably from early morning and late afternoon observations.

*Cloudiness.*—This has a march practically the same as that for the preceding element, with monthly means 8 or higher, on a scale of 0–10, as maximum in the rainy season and means ranging about 5 for most regions in the dry season.

TABLE 14.—*Monthly and annual mean cloudiness (scale 0–10).*

| Stations. | Length of record (years). | January. | February. | March. | April. | May. | June. | July. | August. | September. | October. | November. | December. | Annual. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Belize | 12 | 5.4 | 4.2 | 4.4 | 4.3 | 5.4 | 6.3 | 6.0 | 5.8 | 6.0 | 6.0 | 6.3 | 5.2 | 5.4 |
| Chimax | 7 | 7.1 | 5.9 | 5.9 | 6.3 | 6.7 | 7.8 | 7.9 | 7.3 | 7.5 | 8.0 | 7.7 | 7.5 | 7.1 |
| San Salvador | 14 | 2.4 | 3.1 | 4.1 | 5.6 | 7.0 | 7.5 | 7.3 | 7.3 | 7.6 | 6.4 | 4.6 | 2.4 | 5.4 |
| San Jose | 5 | 4.1 | 4.6 | 5.7 | 6.5 | 7.9 | 8.0 | 7.1 | 7.7 | 7.8 | 8.3 | 6.5 | 6.0 | 6.7 |
| Ancon | 8 | 5.0 | 5.5 | 5.4 | 6.7 | 8.0 | 8.2 | 7.3 | 7.4 | 7.2 | 7.2 | 7.0 | 6.1 | 6.8 |
| Culebra | 7 | 4.9 | 5.0 | 4.7 | 6.3 | 7.7 | 8.1 | 8.0 | 7.8 | 7.7 | 7.9 | 8.0 | 6.1 | 6.8 |
| Colon | 6 | 4.8 | 4.8 | 4.3 | 5.2 | 6.9 | 7.0 | 7.1 | 6.9 | 6.7 | 6.8 | 7.6 | 5.8 | 6.2 |

*Sunshine.*—The average duration of sunshine varies from slightly over 5 hours a day at San José to nearly 9 hours a day at San Salvador, with extremes of about 3.5 hours in July at the former and 10.5 hours in January at the latter station.

TABLE 15.—*Average duration of sunshine (hours).*

| Stations. | Length of record (years). | January. | February. | March. | April. | May. | June. | July. | August. | September. | October. | November. | December. | Annual. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| San Salvador | 14 | 10.4 | 10.3 | 9.6 | 8.5 | 7.7 | 6.6 | 8.2 | 8.8 | 7.5 | 7.7 | 9.2 | 9.9 | 8.7 |
| San Jose | 4 | 7.0 | 8.1 | 7.0 | 6.5 | 5.5 | 3.9 | 3.5 | 4.5 | 4.8 | 3.9 | 5.1 | 4.7 | 5.3 |
| Ancon [1] | 7 | 8.9 | 8.6 | 8.3 | 6.6 | 4.4 | 4.3 | 4.8 | 4.2 | 4.8 | 4.5 | 4.6 | 7.0 | 5.9 |
| Colon [1] | 6 | 8.7 | 8.6 | 8.8 | 8.6 | 6.4 | 5.7 | 5.5 | 5.4 | 5.6 | 4.9 | 4.6 | 6.7 | 6.6 |

[1] Reduced from percentage of possible amount.

*Wind.*—The chief features relative to wind direction are the clockwise shift from about northeast to or somewhat beyond east with the approach of the rainy season over the eastern regions and the marked prevalence of northwest wind on the Pacific coast of the isthmus. Wind movement has a rather well defined march with maximum in February or March and with minimum in June or October. The extremes are about 15 miles an hour at Colon in March and about 4 miles an hour at San José in October. Data on maximum wind velocity are available for no region other than the Canal Zone and vicinity.

TABLE 16.—*Prevailing wind direction.*

| Stations. | Length of record (years). | January. | February. | March. | April. | May. | June. |
|---|---|---|---|---|---|---|---|
| Belize | 11 | ne. | ene, ese. | e, ese. | e, ese. | e. | e, ese. |
| Guatemala | ..... | n, ne. | n, ne. | n, ne. | n, ne. | s, sw. | s, sw. |
| San Salvador | 14 | nw. | s. | s. | sw. | nw. | nw. |
| San Jose | 5 | ne. | ne. | ne. | ne. | e. | e. |
| Ancon | 8 | nw. | nw. | nw. | nw. | nw. | nw. |
| Culebra | 7 | nw. | nw. | nw. | nw. | nw. | nw. |
| Colon | 6 | n, ne. | n, ne. | n. | n. | n. | se. |

| Stations. | July. | August. | September. | October. | November. | December. | Annual. |
|---|---|---|---|---|---|---|---|
| Belize | e. | e, ese. | ese. | nw, nnw. | ne, nnw. | ne, nnw. | e. |
| Guatemala | s, sw. | s, sw. | s, sw. | s, sw. | n, ne. | n, ne. | ..... |
| San Salvador | n. | nw. | nw. | s. | nw. | n. | nw. |
| San Jose | e. | ne. | ne. | ene. | ne. | ene. | ne. |
| Ancon | nw. | nw. | nw. | nw. | nw. | nw. | nw. |
| Culebra | nw. | nw . | nw. | nw. | nw. | nw. | nw. |
| Colon | n, se. | se, w. | se. | se. | w. | n. | n. |

TABLE 17.—*Mean wind movement (miles per hour).*

| Stations. | Length of record (years). | January. | February. | March. | April. | May. | June. | July. | August. | September. | October. | November. | December. | Annual. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| San Jose | 3 | 11.1 | 12.4 | 10.1 | 9.8 | 5.3 | 4.4 | 5.3 | 4.7 | 4.4 | 4.1 | 6.6 | 8.2 | 7.2 |
| Ancon | 8 | 8.9 | 9.6 | 10.4 | 8.6 | 6.2 | 5.8 | 6.9 | 6.3 | 6.0 | 6.4 | 6.3 | 7.3 | 7.4 |
| Culebra | 5 | 8.4 | 9.3 | 9.8 | 9.1 | 6.0 | 5.0 | 6.4 | 5.8 | 5.3 | 4.9 | 6.1 | 7.8 | 7.0 |
| Colon | 6 | 13.6 | 14.9 | 15.0 | 13.4 | 7.8 | 6.6 | 8.5 | 7.8 | 6.9 | 7.0 | 8.8 | 11.3 | 10.1 |

TABLE 18.—*Maximum wind velocity (miles per hour).*

| Stations. | Length of record (years). | January. | February. | March. | April. | May. | June. |
|---|---|---|---|---|---|---|---|
| Ancon | 8 | 28, nw. | 29, nw. | 30, nw. | 26, n. | 27, se. | 34, s. |
| Culebra | 7 | 30, n. | 33, n. | 35, n. | 31, n. | 28, ne. | 31, s. |
| Colon | 6 | 32, n. | 36, ne. | 36, ne. | 33, ne. | 30, n. | 33, se. |

| Stations. | July. | August. | September. | October. | November. | December. | Annual. |
|---|---|---|---|---|---|---|---|
| Ancon | 59, s. | 31, ne. | 31, ne. | 38, se. | 26, se. | 24, nw. | 59, s. |
| Culebra | 39, n. | 40, ne. | 32, ne. | 35, s. | 40, ne | 27, ne. | 40, ne. |
| Colon | 40, s. | 30, s. | 37, w. | 38, sw. | 39, sw. | 38, n. | 40, s. |

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# NOTES, ABSTRACTS, AND REVIEWS.

## HAWAIIAN RAINFALL STATISTICS FOR 1922.[1]

From the published rainfall statistics for Hawaii, 1922, we cull the following interesting information:

The rainfall during the first three months of the year was considerably in excess of the normal; then followed five successive months of deficient rains and the year closed with rainfall about 9 inches below the normal.

The greatest recorded catch, 452.00 inches, was on the summit of Mount Waialeale, Kaui, elevation 5,075 feet [2] and the least 3.18 inches at Olowalu, elevation 10 feet on the leeward shore of Maui. Other points where a catch of more than 300 inches was recorded are, Puu Kukui (upper) Maui, altitude 5,000 feet 346 inches, 103 inches of which is said to have fallen in the single month of January. The catch at Waiakamoi Gulch, Maui, altitude 4,250 ft. was 342.64 inches, which fell in 217 days, or an average of 1.5 inches per day. The rainfall of the Hawaiian Group is almost wholly orographic.

It is only when the northeast trades temporarily weaken or suspend, as happens in the case of the passage of barometric troughs (kona storms), that rain of any consequence falls on the leeward slopes of the islands and this is the explanation of the very small amount registered at Olowalu, as above.—*A. J. H.*

## CONCERNING THE ORIGIN AND DISAPPEARANCE OF SURFACES OF DISCONTINUITY IN THE ATMOSPHERE.

By J. W. SANDSTRÖM.

[Abstracted from *Meteorologische Zeitschrift*, Feb. 1923, pp. 37-39.]

The investigations which have been carried on in the mountains of Sweden have revealed several types of surface of discontinuity, some of which are very obvious and of practical importance, and some of which are easily overlooked. As an example of the former, the clear region bordering the coast which is much utilized by coastwise sailors, is due to the meeting of cold, heavy easterly air with warm, westerly air. The westerly air is underrun by the easterly and an ever-thickening cloud layer is formed which eventually reaches the surface of the sea as a fog bank with an almost vertical front. Other, less-marked, discontinuities occur above valleys in which air has been cooled by radiation and another current of air flows over the top of the valley air. Vague discontinuities occur at the upper surface of a layer of warm surface air in a convective region. After sufficient warm air has accumulated, the ascending column gives rise to very sharp discontinuities between itself and the surrounding atmosphere.

The author has conducted researches relative to the temperature distribution in water under quiet conditions and also when surfaces of discontinuity were formed. The results of these investigations, and also of his meteorological observations, indicate that the relative speed of the two adjacent streams and not the difference in temperature alone determines the degree of sharpness of the surface.

Owing to its geographical situation, Sweden becomes the meeting-ground, in winter, of sharp contrasts in temperature between continental air to the east and oceanic air to the west. With moving cyclones in which these masses of air are converted into rapidly moving streams there frequently appear upon the weather map the phenomena which Bjerknes has related to the Polar Front. But between such moving cyclones, the wind speed is diminished and often it is impossible to trace the surface of discontinuity. Thus, the author

[1] Climatological Data, Hawaii Section, Annual Summary 1922. *Thomas R. Blair, Meteorologist.*
[2] Cf. MO. WEA. REV. 47: 305-308.