W. B. No. 917

Received February 12, 1927
Issued April, 1927

U. S. DEPARTMENT OF AGRICULTURE
WEATHER BUREAU

MONTHLY WEATHER REVIEW

SUPPLEMENT No. 28

CLIMATOLOGICAL DATA FOR THE TROPICAL ISLANDS OF THE PACIFIC OCEAN (OCEANIA)

By W. W. Reed

Submitted for publication January 14, 1927

QC
983
.A21
no. 28
1927

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON
1927

National Oceanic and Atmospheric Administration

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SUPPLEMENTS TO THE MONTHLY WEATHER REVIEW

During the summer of 1913 the issue of the system of publications of the Department of Agriculture was changed and simplified so as to eliminate numerous independent series of bureau bulletins. In accordance with this plan, among other changes, the series of quarto bulletins—letters from A to Z—and the octavo bulletins—numbered from 1 to 44—formerly issued by the U. S. Weather Bureau have come to their close.

Contributions to meteorology such as would have formed bulletins are authorized to appear hereafter as Supplements of the MONTHLY WEATHER REVIEW. (Memorandum from the Office of the Assistant Secretary, May 18, 1914.)

These supplements comprise those more voluminous studies which appear to form permanent contributions to the science of meteorology and of weather forecasting, as well as important communications relating to the other activities of the U. S. Weather Bureau. They appear at irregular intervals as occasion may demand, and contain approximately 100 pages of text, charts, and other illustrations.

Owing to necessary economies in printing, and for other reasons, the edition of SUPPLEMENTS is much smaller than that of the MONTHLY WEATHER REVIEW. SUPPLEMENTS will be sent free of charge to cooperating meteorological services and institutions and to individuals and organizations cooperating with the bureau in the researches which form the subject of the respective supplements. Additional copies of this SUPPLEMENT may be obtained from the Superintendent of Documents, Washington, D. C., to whom remittances should be made.

The price of this SUPPLEMENT is 10 cents.

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CLIMATOLOGICAL DATA FOR THE TROPICAL ISLANDS OF THE PACIFIC OCEAN (OCEANIA)

By W. W. Reed

(Prepared under the direction of Chief, Climatological Division, Weather Bureau, Washington, D. C.)

INTRODUCTION

Most of the oceanic islands of the Pacific lie west of midocean, and practically all are situated west of 130° west longitude. The region covered by the major subdivisions, Micronesia, Melanesia, and Polynesia, is a vast diamond-shaped area extending nearly 6,000 miles from northwest to southeast (Marianne Islands to Low Archipelago) and nearly 4,000 miles from northeast to southwest (Hawaiian Islands to New Caledonia). West of 155° west longitude the region between the Tropics is fairly well covered by the numerous archipelagoes, and the number and distribution of meteorological stations is such as to give interesting information on the climate, which is truly tropical-oceanic or at least only slightly influenced by land.

The data presented here were compiled in large part from the well-known publications listed under "Bibliography" (p. 22). The titles of the observers given with the current reports indicate a competent personnel, and the notations by the editors show that care has been taken to exclude all faulty records.

Throughout this paper temperatures are expressed in degrees Fahrenheit (°F.), relative humidity in percentage of saturation, cloudiness on the scale 0–10, precipitation in inches, and wind velocity in miles per hour.

GENERAL CONDITIONS

Before presenting the data for the several groups in order it will be well to give a brief general survey of the main features of the distribution of temperature, relative humidity, cloudiness, precipitation, and wind.

Temperature.—Table 1 gives mean monthly and annual temperatures for a selected list of stations at or near sea level arranged according to latitude. From this table it appears that the highest mean annual temperature, 83.4° (at Nauru, Gilbert Islands), is found in the immediate vicinity of the Equator. The mean annual temperature of the zone from 5° N. to 4° S. exceeds 82°, and that of the zone from about 15° N. to about 15° S. is generally above 80°. This symmetry of temperature distribution continues to the limits of the Torrid Zone as shown by the mean of 74° at Honolulu, Hawaiian Islands, and Noumea, New Caledonia. The decrease in temperature with increase in latitude is not entirely uniform, probably on account of the entrance of factors such as difference in exposure (windward or leeward), as at Hilo and Honolulu, and change to greater elevation as at Herbertshohe.

The difference in the temperature means for the warmest and the coolest months is only 0.6° at Ocean Island (0° 52′ S.), and it is still less than 2.5° over the middle zone of 20° width, beyond which there is an increase to about 7.5° at the northern and 10.5° at the southern limit of this region. Temperature march of the Northern Hemisphere type is fairly well defined as far south as 9° N., and that of the Southern Hemisphere type as far north as 10° S.

The only records of maximum temperatures of 100° or higher are those for the stations on Christmas and Fanning Islands. Maximum temperatures are 95° to 99° for most of the reporting stations, but at some of the stations near the Tropics they are only slightly above 90°. The lowest temperatures recorded near sea level in the middle zone of 20° width range from 65° to 70°; at the distance of 15° from the Equator there is an occasional fall to below 60° and at 20° to about 50°.

Data on decrease in temperature with increase in elevation are available only for the Hawaiian Islands; those for Hawaii are given in Table 32. The mean annual temperatures on the island of Hawaii are Hilo (40 feet), 72°; Holualoa (1,450 feet), 69°; Waimea (2,700 feet), 63°; Volcano House (4,000 feet), 61°; and Humuula (6,685 feet), 52°.

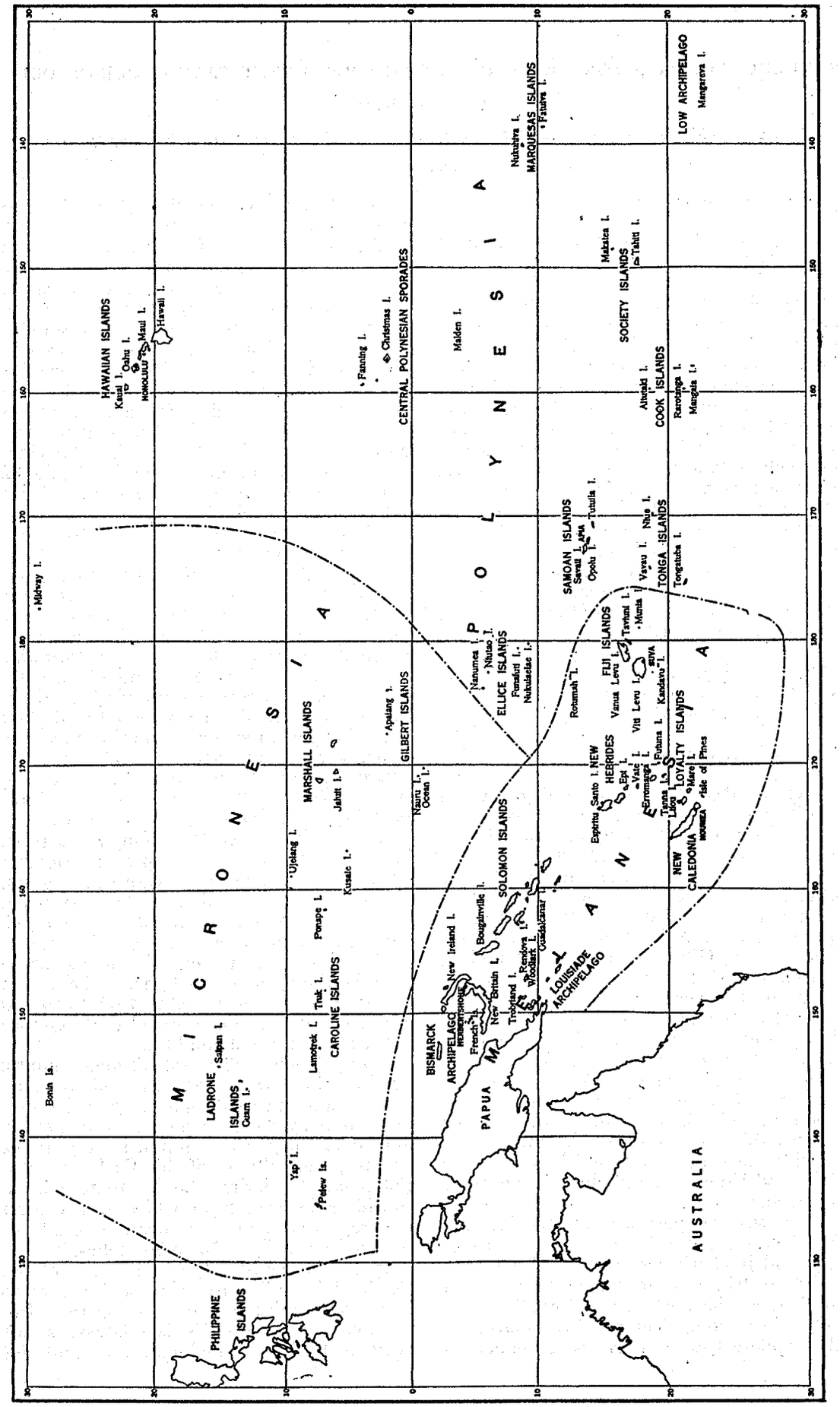
Relative humidity.—Reference to the values for Apia, Samoan Islands, (Table 40), shows that means according to the formula (7a. + 2p. + 9p.) ÷ 3 give a rather close approximation to the mean of 24 hours. The values in Table 2 are derived by use of this formula.

Over nearly all parts of this extensive area the mean annual value of relative humidity, as determined by the above formula, lies between 80 and 85 per cent, and the difference in extreme monthly means averages about 6 per cent. The mean annual value for 2 p. m., an approximation to the minimum for the day, is generally between 70 and 80 per cent, and the difference in extreme monthly means is about the same as that found for the tridaily values. At Honolulu, as is probably the case in other regions with light precipitation, relative humidity has very much lower values, the annual daily mean (bihourly) being a little below 70 per cent and the mean for 2 p. m. about 60 per cent, with a seasonal change of about 6 per cent in both cases.

Cloudiness.—Data on cloudiness are given in the records of only a few stations. The means from tridaily observations given in Table 3 relate to widely separated areas, but it may be assumed that they are fairly representative of general conditions.

Precipitation.—The table of mean monthly and annual precipitation for stations selected to indicate either the average amount by data for a typical station or the range in amount by data for stations where extreme conditions are found shows that rainfall is very abundant to excessive in practically all of this Pacific territory. Southern Polynesia, bordering the Temperate Zone, is the only considerable area from which heavy annual rainfall is not reported; here the mean amount of precipitation received annually is 55 to 80 inches.

In the larger islands and in some of the smaller ones the land is sufficiently elevated to give the contrast in amount of rainfall typical of change from leeward to windward exposure. This contrast is well defined for stations in New Caledonia, Fiji, and Samoan Islands,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Oahu I.
HONOLULU
Maui I.
Hawaii I.
Midway I.
Fanning I.
Christmas I.
CENTRAL POLYNESIAN SPORADES
Malden I.
Nukuhiva I.
MARQUESAS ISLANDS
Fatuiva I.
LOW ARCHIPELAGO
Mangareva I.
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Tahiti I.
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Erromango I.
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NEW HEBRIDES
Epi I.
Vate I.
NEW CALEDONIA
NOUMEA
Nanumea I.
Nhutao I.
ELLICE ISLANDS
Funafuti I.
Nukulaelae I.
Apaiang I.
GILBERT ISLANDS
Nauru I.
Ocean I.
Ujelang I.
MARSHALL ISLANDS
Jaluit I.
Kusaie I.
Ponape I.
Truk I.
CAROLINE ISLANDS
Lamotrek I.
Yap I.
Palau Is.
Bonin Is.
LADRONE ISLANDS
Saipan I.
Guam I.
PHILIPPINE ISLANDS
BISMARCK ARCHIPELAGO
HERMENSHORN
New Ireland I.
New Britain I.
Bougainville I.
SOLOMON ISLANDS
Guadalcanal I.
Rennova I.
Woodlark I.
Trobriand I.
French I.
LOUISIADE ARCHIPELAGO
PAPUA
AUSTRALIA
MICRONESIA
POLYNESIA
MELANESIA

and is unusually striking in the values for the principal islands of the Hawaiian group. The annual means for Waiawa (22 inches) and Mount Waialeale (476 inches), both on the island of Kauai, may be considered the extremes for all Oceania.

At some distance north and south of the Equator, where the range in monthly mean temperature is such that the year may be considered to be divided into a warmer and a cooler season, there is a tendency to maximum precipitation in the warmer season and minimum in the cooler season. This holds rather uniformly for nearly all of Micronesia, southern Melanesia, and southern Polynesia.

In all three of the major subdivisions local monthly means exceed 10 inches for several successive months or even through the year; local maximum monthly means exceed 20 inches. On the other hand, there are found in these grand divisions stations where the minimum monthly mean falls to 2 inches or considerably less.

Data on number of days with precipitation and maximum amount in 24 hours are given in tables accompanying the discussion of the several minor subdivisions.

Precipitation is extremely variable in all of Oceania. From table 50, containing the monthly records for several stations with rather long series of observations and showing this variation in detail, there are presented here in Table 5 some data on precipitation extremes.

The changes from year to year are sometimes exceedingly abrupt and the extreme values show most remarkable differences. Even at Noumea, New Caledonia, where this feature is least marked, the extreme annual totals differ by 56 inches, while on Nauru Island there is a difference of 142 inches. Differences in extreme monthly totals and in extreme totals for the same month of the year give further evidence of the large variability in amounts of precipitation. Many of the stations have received practically no rain in some months and amounts exceeding 25 inches in others.

Winds.—In the table giving prevailing wind directions the data, which are taken from the Pilot Charts issued by the United States Hydrographic Office, supplemented by maps in Bartholomew's Physical Atlas, volume III, Plate 12, and text in Hann's Handbuch der Klimatologie, third edition, are arranged for three zones. The division is according to latitude, showing northeast wind prevailing north of 7° 30′ N., and, with the exception of the midocean area, southeast wind prevailing south of 2° 30′ S. The width and the location of the intermediate zone, commonly known as the belt of calms, as indicated by this division agrees approximately with the limits given in Hann's Lehrbuch der Meteorologie, third edition, page 463: 5°–3° N. in March and 10°–7° N. in September, which are called the extreme months.

In the northern zone the northeast trade wind prevails throughout the year in the Hawaiian Islands, and approximately from November to April in all of the area to the west of that region. In the summer of the Northern Hemisphere the wind shifts to east on and west of the Marshall Islands, and in the regions of the Marianne Islands is known as the east monsoon. East winds prevail in the middle zone, but northeast and southeast winds have frequency approaching that of the prevailing direction, and in the Gilbert Islands northeast is the prevailing direction approximately from December to April, conditions closely resembling those found in the Marshall Islands immediately to the north.

A very interesting discussion of wind and other meteorological elements in the region of the Central Sporades and the Gilbert Islands is given by C. E. P. Brooks and H. W. Braby in the paper, "The Clash of the Trades in the Pacific" in the Quarterly Journal of the Royal Meteorological Society (London), January, 1921.

In the southern zone, the region of the southeast trade winds, two features are to be noted. In the eastern groups of islands the prevailing wind is charted as east throughout the year; however, the southeast trade, which might be considered as normal, and the northeast winds have such great frequency that the winds may be classified more properly as northeast to southeast. The second feature is the prevalence of northwest winds (northwest monsoon) in the western part of this zone, the region of the Bismarck Archipelago and the Solomon Islands, from December to February. The two groups last named constitute the only considerable region of Oceania in which the wind has a westerly component in any part of the year.

Tropical storms.—Storms of hurricane force, generally known as typhoons, visit many of the island groups of the Pacific. The region between the Marianne and the western Caroline Islands is an important center of origin, and the islands of Guam and Yap may be considered as marking the main gateway through which these storms pass to recurve over the ocean at some moderate distance to the west or to continue to the Philippine Islands or even the coast regions of China, as is shown in the tracks given by Algué in "Cyclones of the Far East" and by Froc in the "Atlas of the Tracks of 620 Typhoons in the Far East, 1893–1918." Many of these typhoons probably have their beginning at a considerable distance to the east of Yap and Guam, as is evidenced by the fact that Algué classifies as a group those recurving in the vicinity of the Marianne Islands. In this area these violent storms have occurred in all months of the year; the seasons showing extremes of frequency are practically the same as given by Froc for the Far East—maximum from July to October and minimum from February to April. In "Tropical Storms of the Eastern North Pacific Ocean," by W. E. Hurd, published in the Pilot Chart of the North Pacific Ocean, August, 1926, there appears a chart of hurricane paths off the western coast of Mexico. The latitude of the center of origin is the same as found for the western Pacific, but here, while the season of maximum frequency is in agreement with conditions in the western limits of the ocean, the occurrence is limited to summer and autumn.

Charts accompanying the paper by Visher, "Tropical Cyclones in Australia and the South Pacific and Indian Oceans," published in the Monthly Weather Review for June, 1922, give distribution of hurricanes in the South Pacific Ocean. These storms are much more frequent in the region between Australia and the Samoan Islands than farther to the east. The latitude of the centers of origin is practically the same as noted for the North Pacific. The season of greatest frequency begins in December and ends in April; the maximum activity occurs from January to March. In this region also, typhoons have occurred in all other months of the year, but are rare from May to October.

TABLE 1.—*Mean monthly and annual temperature (° F.)*

Stations	Island group	Latitude	Elevation in feet	Length of record in years	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
		° ′															
Honolulu (Oahu)	Hawaii	21 18 N.	111	14	70.5	70.7	71.1	72.7	74.6	76.2	77.3	78.1	78.0	76.8	74.6	72.6	74.4
Hilo (Hawaii)	do	19 44	40	14	69.7	69.2	69.8	70.6	72.2	73.0	73.9	74.8	74.4	74.0	72.6	70.8	72.1
Sumay (Guam)	Marianne	13 24	67	17	79.0	78.6	79.8	81.2	82.0	82.2	81.0	80.6	80.6	80.5	80.7	80.0	80.5
Ujelang I	Marshall	9 42	30	4	80.6	80.6	81.2	81.4	82.3	82.4	82.4	82.8	82.8	82.8	81.8	81.4	81.9
Meeth (Yap)	Caroline	9 29	104	12	81.1	81.0	81.6	82.4	82.5	82.5	81.2	81.3	81.5	81.6	82.0	81.5	81.7
Jaluit I	Marshall	5 56	15	4	82.4	83.0	82.1	82.0	81.6	81.7	81.6	82.2	81.8	83.2	83.3	82.8	82.3
Fanning I	Central Sporades	3 55	10	10	81.8	81.6	81.8	81.8	82.0	82.3	82.4	82.8	82.4	82.8	83.6	82.1	82.3
Nauru I	Gilbert	0 26 S.	26	4	83.2	83.0	83.8	83.4	84.0	83.1	82.8	83.0	83.2	83.8	83.8	83.4	83.4
Ocean I	do	0 52	85	12	82.2	82.2	82.2	82.2	82.1	82.2	82.0	82.3	82.2	82.4	82.6	82.4	82.2
Malden I	Central Sporades	3 59	26	7	81.5	81.7	82.0	82.0	82.4	83.2	82.8	82.6	82.4	81.9	81.7	81.6	82.2
Herbertshohe (New Britain)	Bismarck Archipelago	4 20	200	6	80.5	79.9	80.0	80.8	80.9	80.6	79.9	79.6	80.4	80.8	80.8	80.8	80.4
Tulagi (Florida)	Solomon	9 45	7	9	82.7	82.0	82.3	82.4	82.0	81.2	81.0	80.6	81.2	81.6	82.5	83.2	81.9
Apia (Opolu)	Samoa	13 48	16	15	79.6	79.9	80.0	79.4	78.7	77.6	77.2	77.4	77.9	78.7	79.0	79.6	78.8
Makatea I	Low Archipelago	15 47	154	6	81.9	80.9	81.6	80.6	79.6	78.5	77.6	77.6	78.2	79.8	81.0	81.3	79.9
Delanasua (Vanua Levu)	Fiji	16 38	70	15	80.7	80.5	80.4	80.0	79.3	77.7	76.8	77.3	77.8	79.1	80.1	81.1	79.2
Papeiti (Tahiti)	Society	17 32	20	15	80.2	80.4	80.4	80.2	78.4	77.4	76.3	76.6	77.8	78.4	79.2	79.6	78.7
Suva (Viti Levu)	Fiji	18 8	44	33	79.9	80.4	80.0	78.6	76.6	74.8	73.6	73.7	74.6	76.0	77.2	79.0	77.0
Alofi (Niue)	Tonga	19 2	120	8	79.7	80.0	80.6	78.8	76.2	73.8	73.4	73.2	74.1	75.4	76.7	78.8	76.7
Futuna I	New Hebrides	19 30	98	6	81.2	82.0	80.8	78.9	76.8	73.4	73.4	73.0	74.0	76.1	77.9	79.8	77.3
Pouebo	New Caledonia	20 20	26	6	79.2	80.4	79.6	78.2	74.6	72.0	70.7	70.2	72.0	73.9	76.4	78.6	75.5
Avarua (Rarotanga)	Cook	21 12	20	14	78.0	78.4	78.0	76.2	73.4	71.2	70.2	70.0	71.2	72.6	74.4	76.6	74.2
Noumea	New Caledonia	22 16	30	10	79.0	79.0	78.5	76.4	72.6	70.3	68.7	68.6	70.4	72.4	75.5	78.0	74.1

TABLE 2.—*Mean monthly and annual relative humidity (per cent)*

Mean, 7a., 2p., 9p.

Stations	Length of record, years	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Honolulu [1]	5	71	69	67	67	67	66	65	66	65	68	68	71	68
Ujelang I	4	80	80	80	81	83	83	84	84	84	85	84	81	82
Jaluit I	4	85	85	84	86	86	86	85	84	83	82	85	85	85
Nauru I	4	80	82	80	80	80	81	80	80	77	77	79	80	80
Herbertshohe (B. Archipelago)	4	83	84	83	83	81	81	80	81	79	78	78	82	81
Ro-Mare (Loyalty Is.)	4	81	81	82	82	83	79	83	81	78	75	77	76	80
Apia (Samoa)	20	87	87	86	87	85	84	83	82	83	84	86	86	85
Avarua (Cook Islands)	2	86	86	83	82	84	82	80	78	84	76	82	86	84

Mean, 2 p. m.

Honolulu	5	64	59	58	58	59	57	57	57	57	60	59	63	59
Ujelang I	4	77	77	76	78	78	79	79	78	80	80	80	78	78
Jaluit I	4	78	77	77	79	80	79	77	75	75	73	77	78	77
Nauru I	4	71	74	71	71	70	72	71	71	67	67	70	72	71
Herbertshohe (B. Archipelago)	4	74	77	75	76	71	72	72	72	70	68	72	75	73
Ro-Mare (Loyalty Is.)	4	75	76	76	75	72	71	74	73	70	67	69	68	73
Apia (Samoa)	20	80	80	78	79	76	76	75	75	77	78	79	79	78
Avarua (Cook Islands)	2	78	78	72	74	76	72	68	70	77	68	74	81	76

[1] Bihourly observations.

TABLE 3.—*Mean monthly and annual cloudiness* [1] *(scale 0–10)*

Stations	Length of record, years	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Honolulu	10	4.4	4.9	4.7	5.0	4.6	4.1	4.0	4.6	4.0	4.6	4.9	4.5	4.5
Ujelang I	4	4.5	4.3	4.5	5.0	5.1	5.0	5.2	5.0	5.5	5.5	5.0	4.5	4.8
Herbertshohe (B. Archipelago)	4	6.4	7.9	6.4	6.0	5.4	6.4	6.8	6.5	6.1	5.9	6.1	6.6	6.4
Apia (Samoa)	20	7.1	6.3	6.1	5.7	4.7	4.9	4.5	4.2	5.2	5.4	6.1	6.7	5.6

[1] Mean of three observations: 7 a. m., 2 p. m., and 9 p. m.

TABLE 4.—*Mean monthly and annual precipitation (in inches)*

Stations	Length of record, years	January	February	March	April	May	June	July	August	September	October	November	December	Annual
MICRONESIA														
Marianne Islands														
Sumay (Guam)	17	2.42	2.86	3.19	2.18	4.07	5.65	14.24	15.70	16.14	12.61	7.20	4.80	91.06
Caroline Islands														
Meeth (Yap)	20	6.35	7.29	6.03	5.13	10.13	10.15	15.72	15.76	13.02	11.86	9.46	8.17	119.07
Ponape I	10	10.41	7.31	11.74	20.26	18.92	15.31	16.83	16.08	15.73	14.56	14.70	15.88	177.73
Kusaie I., Mission	10	19.00	15.28	27.25	21.35	28.74	22.55	23.93	20.19	24.88	15.57	19.35	16.70	254.79
Marshall Islands														
Ujelang I	17	2.12	1.78	2.62	5.25	6.63	7.14	8.36	8.46	10.29	10.38	9.55	4.85	77.43
Jaluit I	17	10.19	8.53	14.22	15.76	16.57	15.27	15.36	12.04	13.05	12.17	11.89	13.57	158.62
Gilbert Islands														
Ocean I	12	12.88	9.03	8.43	8.49	6.07	5.13	5.67	2.67	3.90	4.80	5.74	8.03	80.84
MELANESIA														
Bismarck Archipelago														
Herbertshohe (New Britain)	9	8.20	6.95	8.92	5.43	4.37	5.75	6.02	6.34	3.93	3.39	6.20	7.99	73.51
Peterhafen (French Islands)	10	15.63	11.94	17.91	13.80	10.27	6.08	6.49	4.23	5.70	6.92	13.65	17.63	130.25
Solomon Islands														
Lunga (Guadalcanar)	7	15.31	12.64	17.63	6.37	5.40	4.81	3.26	3.21	4.22	5.09	6.35	9.71	94.00
Kau Kau (Guadalcanar)	5	13.64	10.35	11.84	12.04	16.70	17.76	22.03	18.81	13.62	21.47	12.90	8.47	179.63
New Hebrides Islands														
Dillons Bay (Erromango)	6	11.60	8.03	10.34	5.96	4.75	2.12	2.77	1.34	2.57	2.13	3.80	5.14	60.55
Port Narraven (Erromango)	7	21.01	12.04	18.84	11.63	10.81	6.60	6.29	8.90	8.93	6.88	8.88	11.73	132.54
Loyalty Islands														
Ro-Mare (Mare)	4	6.69	3.30	9.19	5.10	3.87	4.52	4.92	4.88	4.40	3.13	1.75	2.43	54.18
New Caledonia														
Centre-Oumanie	10	3.82	4.44	4.28	2.40	2.86	4.70	2.48	2.19	1.15	0.88	1.95	1.45	32.60
Annaville	3	12.56	14.59	9.04	16.22	12.72	10.63	4.07	7.40	9.65	2.53	6.44	3.46	109.81
Fiji Islands														
Labasa (Vanua Levu)	24	12.72	14.14	13.54	8.12	4.26	2.32	1.94	1.86	2.71	3.20	5.14	10.12	80.07
Wainunu (Vanua Levu)	39	18.95	17.48	18.49	15.27	11.47	6.62	5.67	6.86	9.27	11.16	12.11	16.11	149.86
Lautoka (Viti Levu)	18	9.06	12.49	10.63	4.31	4.57	2.14	1.99	3.32	1.80	2.96	3.79	7.89	64.95
Navua (Viti Levu)	34	14.81	12.07	16.28	15.07	13.69	8.34	5.83	10.08	8.82	11.02	12.41	14.77	143.19
Rabi (Rambe)	14	20.06	16.76	20.43	17.63	15.81	8.04	4.85	7.98	8.99	9.67	11.92	18.67	160.81
POLYNESIA														
Hawaiian Islands														
Humuula (Hawaii)	8	2.43	2.89	2.39	2.12	1.85	1.00	1.79	4.73	2.08	2.59	4.22	4.19	32.28
Kawainui (Hawaii)	12	18.17	19.58	19.70	24.33	24.90	28.67	30.30	27.60	20.02	17.97	23.95	21.42	276.61
Kaanapali (Maui)	20	4.22	3.24	2.26	1.43	0.93	0.36	0.48	1.22	0.50	0.69	1.55	3.24	20.12
Puu Kukui (Maui)	7	25.81	22.52	32.61	46.91	26.00	33.51	35.09	29.80	22.20	24.93	38.21	32.48	370.07
Honolulu (Oahu)	35	3.24	4.52	3.65	2.05	1.66	0.93	0.92	1.24	1.47	1.75	3.80	4.52	29.75
Luakaha (Oahu)	14	12.32	9.98	15.49	15.59	16.01	11.29	11.06	13.45	13.26	10.18	14.71	16.92	160.26
Waiawa (Kauai)	35	3.08	3.16	4.07	1.03	1.05	0.44	0.47	0.38	1.36	1.37	2.69	3.11	22.21
H-M Divide (Kauai) [1]	8	19.02	10.70	16.92	20.15	17.79	18.78	22.51	19.08	20.71	19.14	27.08	25.17	237.05
Mt. Waialeale (Kauai)	5													476.00
Central Sporades														
Malden Island	27	3.33	1.52	4.34	4.12	3.88	1.79	1.93	1.59	0.80	1.00	0.77	0.83	25.90
Fanning Island	13	10.77	9.72	12.54	17.04	13.99	11.49	11.24	5.71	3.99	4.98	3.76	12.99	118.22
Samoan Islands														
Salailua (Savaii)	6	15.67	12.04	15.38	9.72	13.02	7.77	10.85	13.12	13.00	11.81	14.41	11.80	148.59
Mulifanua (Opolu)	14	13.59	11.58	11.72	6.91	4.21	4.62	2.93	2.88	4.52	6.17	9.54	11.05	89.72
Falealili (Opolu)	4	15.44	11.50	18.92	14.65	14.19	12.80	14.10	10.61	19.53	20.74	21.53	11.75	185.76
Pago Pago (Tutuila)	22	21.92	23.50	19.06	17.67	15.27	14.38	9.90	7.66	12.87	15.76	19.33	18.93	196.25
Tonga Islands														
Alofi (Niue)	12	10.28	10.86	11.68	7.55	5.11	3.45	2.36	4.55	5.08	3.70	5.26	9.78	79.66
Cook Islands														
Avarua (Rarotanga)	20	9.80	10.85	11.80	8.25	6.43	4.13	3.66	4.55	4.54	4.75	6.49	7.47	82.72
Society Islands														
Papeiti (Tahiti)	35	8.21	7.44	6.94	4.34	3.33	2.72	1.91	1.63	2.29	3.52	5.18	8.01	55.52
Low Archipelago														
Makatea I	6	6.72	8.84	6.10	7.13	3.57	4.76	3.21	4.29	3.68	3.29	5.06	5.46	62.11

[1] Hiloa-Manawalopuna Divide.

TABLE 5.—*Precipitation—Extreme records, annual and monthly, at selected stations (in inches)*

Stations	Annual mean	Greatest annual total	Least annual total	Difference	Greatest monthly amount	Least monthly amount	Difference	Greatest difference for same month of the year	Month
Meeth (Caroline Is.)	119.07	152.02	72.92	79.10	45.76	0.70	45.06	41.33	July.
Ujelang I. (Marshall Is.)	77.43	114.33	51.32	63.01	24.26	0.29	23.97	22.39	June.
Nauru I. (Gilbert Is.)	84.22	163.20	21.40	141.80	29.65	0.03	29.62	29.48	Feb.
Raniola (Bismarck Archipelago)	84.05	133.33	42.19	91.14	25.35	0.12	25.23	22.87	Dec.
Tulagi (Solomon Is.)	115.37	162.08	62.12	99.96	41.93	0.24	41.69	37.31	Mar.
Noumea (New Caledonia)	43.52	75.77	19.65	56.12	19.06	0.00	19.06	18.91	Nov.
Suva (Fiji Is.)	112.38	169.62	73.03	96.59	37.33	0.11	37.22	36.52	Aug.
Malden Is. (Central Sporades)	25.90	93.59	3.94	89.65	25.75	0.00	25.75	25.59	Mar.
Apia (Samoan Is.)	113.12	172.71	68.78	103.93	39.96	0.08	39.88	36.38	Jan.
Avarua (Cook Is.)	82.72	116.64	46.05	70.59	38.30	0.31	37.99	33.22	Mar.
Papeiti (Society Is.)	55.52	130.33	12.26	118.07	42.43	0.00	42.43	42.08	Dec.

TABLE 6.—*Prevailing wind direction*

Islands	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Hawaiian Is.	ne.	ne.	ne.	ne.	ne.	ne.	ne.	ne.	ne.	ne.	ne.	ne.	ne.
Marshall Is.	ne.	ne.	ne.	ne.	e.	e.	e.	e.	e.	e.	ne.	ne.	ne.
Caroline Is.	ne.	ne.	ne.	ne.	ne.	e.	e.	e.	ne.	ne.	ne.	ne.	ne.
Marianne Is.	ne.	ne.	ne.	ne.	ne.	e.	e.	e.	ne.	ne.	ne.	ne.	ne.
Central Sporades [1]	e.	e.	e.	e.	e.	e.	e.	e.	e.	e.	e.	e.	e.
Gilbert Is.	ne.	ne.	ne.	ne.	e.	e.	e.	e.	e.	e.	e.	ne.	e.
Marquesas Is.[1]	e.	e.	e.	e.	e.	e.	e.	e.	e.	e.	e.	e.	e.
Samoan Is.[2]	se.	se.	se.	se.	se.	se.	e.	e.	e.	se.	se	se.	se.
Solomon Is.	nw.	nw.	e.	e.	se.	se.	se.	se.	se.	se.	se.	nw.	se.
Bismarck Archipelago	nw.	nw.	se.	se.	se.	se.	se.	se.	se.	se.	nw.	nw.	se.
Low Archipelago [2]	e.	e.	e.	e.	e.	e.	e.	e.	e.	e.	e.	e.	e.
Society Is.[1]	e.	e.	e.	e.	e.	e.	e.	e.	e.	e.	e.	e.	e.
Cook Is.[2]	se.	se.	se.	se.	se.	se.	se.	se.	se.	se.	se.	se.	se.
Fiji Is.[2]	se.	se.	se.	se.	se.	se.	se.	se.	se.	se.	se.	se.	se.
New Hebrides Is.[2]	se.	se.	se.	se.	se.	se.	se.	se.	se.	se.	se.	se.	se.
New Caledonia [2]	se.	se.	se.	se.	se.	se.	se.	se.	se.	se.	se.	se.	se.

[1] Northeast and southeast winds have frequency approaching very nearly that of the east wind.
[2] East winds, given as prevailing in adjacent regions, show a percentage of frequency not much lower than that of the southeast winds.

CLIMATIC CONDITIONS IN THE SEVERAL ISLANDS OR GROUPS OF ISLANDS

The remainder of the paper is given to a presentation of short descriptive text and tabulated data for the region generally called Oceania and subdivided into three grand divisions—Micronesia, occupying the northwestern, Melanesia, the southwestern, and Polynesia, the eastern area.

MICRONESIA

This name, derived from the Greek words for "small" and "island," is very aptly descriptive. With the exception of some of the Gilbert Islands this grand division lies north of the Equator; it stretches from the vicinity of the Philippine Islands, 130° east longitude, nearly to midocean, 180° E. The northern Marianne (or Ladrone) Islands belong to the volcanic region extending south from Japan. The remaining lands are mainly of coral origin; coral reefs surround many of the western islands and atoll formations appear rather generally in the eastern groups.

The groups forming Micronesia are the following: Marianne (Ladrone), Pelew, Caroline, Marshall, and Gilbert Islands.

MARIANNE OR LADRONE ISLANDS

This archipelago lies between 12° and 21° north latitude at about 145° east longitude, 1,500 miles east of Luzon of the Philippines. Guam and Saipan are the largest and most important islands.

Meteorological data for Sumay, Guam (13° 24′ N., 144° 38′ E., elevation 67 feet), for the period 1906–1922 published in the monthly bulletins and annual reports of the Philippine Weather Bureau are chosen to represent conditions in this region; the records at the agricultural experiment station (U. S. Weather Bureau) beginning in 1917 are less complete.

The mean annual temperature in the southern part of the Marianne group is about 80°; the temperature march is of the Northern Hemisphere type, but the difference between the means for January–February and May–June is only 3°. The mean annual rainfall is 80 to 100 inches, about 60 per cent of which is received from July to October, inclusive. From October to July the winds at Sumay blow from east-northeast or east, in the remaining months south to southwest winds and calms are frequent.

TABLE 7.—*Sumay, Guam*

	Length of record, years	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Temperature														
Mean maximum	17	83.3	83.4	84.9	86.4	87.4	87.6	86.2	85.6	85.6	85.3	85.1	84.2	85.4
Mean minimum	17	74.7	73.9	74.8	76.1	76.5	76.8	75.9	75.7	75.6	75.7	76.3	75.9	75.6
Mean	17	79.0	78.6	79.8	81.2	82.0	82.2	81.0	80.6	80.6	80.5	80.7	80.0	80.5
Highest	17	87	88	90	91	91	93	92	90	90	90	89	87	93
Lowest	17	69	64	68	70	71	72	70	71	70	69	69	70	64
Relative humidity														
Mean, 6a	11	84	84	84	83	84	85	88	90	89	88	87	85	86
Mean, 2p	11	72	71	69	67	68	71	75	78	78	78	76	73	73
Cloudiness														
Mean, 6a, 2p	12	7.4	7.4	7.0	6.6	6.6	7.2	8.0	8.5	8.4	8.2	7.2	7.3	7.5
Wind														
Prevailing direction	7	ene.	ene.	ene.	ene.	e.	ene.	ene.	s,sw	s,sw	ene.	ene.	ene.	ene.
Mean velocity, miles per hour [1]	1–4	8.4	8.5	7.9	6.8	5.3	4.4	3.6	5.4	3.4	3.9	6.5	8.1	6.0
Days with thunderstorm														
Mean number	5	0	0	0	1	0	1	2	2	3	3	3	0	15

[1] Agricultural experiment station situated a few miles northeast of Sumay.

TABLE 8.—*Precipitation data, Marianne Islands*

Stations	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Guam I.	Mean precipitation (in inches)												
Sumay [1]	2.42	2.86	3.19	2.18	4.07	5.65	14.24	15.70	16.14	12.61	7.20	4.80	91.06
Agricultural Experiment Station [2]	3.19	3.44	[3] 4.66	3.04	4.19	6.86	17.18	16.86	15.14	11.76	7.28	4.46	98.06
Saipan I.													
Garapan [4]	2.02	3.40	4.08	2.85	3.04	5.56	9.01	14.09	12.74	12.14	8.17	5.66	82.76
Guam I.	Maximum precipitation in 24 hours (in inches)												
Sumay [1]	1.55	3.40	6.50	2.30	4.50	2.95	10.50	6.70	6.60	5.70	8.85	3.00	10.50
Agricultural Experiment Station [2]	2.26	4.47	[3] 7.60	2.70	3.10	4.78	10.50	5.90	5.78	4.60	4.11	2.71	10.50
Saipan I.													
Garapan [4]	1.28	2.13	6.09	2.80	5.34	3.71	4.09	8.86	5.39	4.57	13.07	2.73	13.07
Guam I.	Mean number of days with precipitation												
Sumay [1]	14	11	11	9	13	17	24	23	22	22	19	18	203
Agricultural Experiment Station [2]	17	14	16	16	17	20	24	26	23	25	23	20	241
Saipan I.													
Garapan [4]	12	11	13	14	13	17	23	23	23	23	19	19	210

[1] Period 1906–1922.
[2] 8-year record in the period 1917–1925. Coordinates of station 13° 26′ N., 144° 40′ E.
[3] Raingage blown away by typhoon in March, 1923; record for one day missing.
[4] Period 1901–1913. Record in Mitteilungen aus den deutschen Schutzgebieten, 15–27.

PELEW ISLANDS

The largest and most important of these islands lie between 7° and 8° north latitude and 134° and 135° east longitude about 500 miles east of Mindanao of the Philippines. They are hilly and heavily wooded, and, like the southern Ladrones, surrounded by coral reefs.

In Mitteilungen aus den deutschen Schutzgebieten, 30, are found references to the volumes of that publication containing data for Angaur, Malakal, and Korror (7° 20′ N., 134° 33′ E.). No temperature data are available; approximately accurate information may be derived from the data given for Yap, of the Caroline Islands. Precipitation data are given for Korror only; the records for the other islands are short and fragmentary.

Precipitation data appear in the table for the Caroline Islands.

CAROLINE ISLANDS

This subdivision is the largest in Micronesia and one of the largest in Oceania. It lies between latitudes 5° and 10° north and extends from the vicinity of the Pelew Islands eastward about 1,800 miles to the Marshall Islands. The area is dotted with coral islets; only a few of the larger islands have any considerable elevation.

Meeth, on the island of Yap near the western limit of the group, is the only station for which there are records of meteorological elements other than precipitation. The data for Ujelang Island of the Marshall group may be taken as representative of conditions prevailing in the eastern part of the region. Information on rainfall is much more complete; records are available for the following islands: Yap, 9° 29′ N., 138° 8′ E. (elevation of station 104 feet); Lamotrek, 7° 27′ N., 146° 22′ E., Truk, 7° 21′ N., 151° 54′ E.; Ponape, 6° 58′ N., 158° 16′ E.; Kusaie, 5° 20′ N., 163° 5′ E.

Records for all of these stations are published in Mitteilungen aus den deutschen Schutzgebieten (Südsee), 14–27, 30; those for Yap are supplemented by data given in the publications of the Philippine Weather Bureau.

In the western region (Meeth, Yap) mean monthly temperatures range from 81.0° in February to 82.5° in May and June; the highest temperatures recorded in the several months range from 93° to 98° and the lowest from 67° to 72°. The average annual rainfall is 105 to 125 inches over the western half of the area; toward the eastern limits it increases to 175 inches or more. The marked difference in the means for Lelahafen and Mission Station on Kusaie is probably an indication of the extent to which topography may influence precipitation in this region. In general rainfall is least from January to March; it then increases more or less rapidly to the April–May maximum in the east and the July–August maximum in the west. On Yap northeasterly winds prevail from November to June, while calms or southwesterly winds are most frequent in the remaining months.

TABLE 9.—*Meeth, Yap*

	Length of record, years	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Temperature														
Mean maximum	12	87.4	87.3	88.5	89.2	89.1	89.1	87.6	87.8	88.2	88.5	88.3	87.4	88.2
Mean minimum	12	74.8	74.7	74.8	75.7	75.9	75.9	74.8	74.8	74.8	75.0	75.7	75.6	75.2
Mean	12	81.1	81.0	81.6	82.4	82.5	82.5	81.2	81.3	81.5	81.6	82.0	81.5	81.7
Highest	12	94	93	96	98	94	95	94	94	94	94	94	94	98
Lowest	12	68	67	68	67	70	72	70	70	69	69	70	70	67
Relative humidity														
Mean, 6a	7	87	88	87	88	91	91	92	91	91	92	91	89	90
Mean, 2p	7	73	72	70	71	75	76	77	78	76	78	76	75	75
Cloudiness														
Mean, 6a, 2p	7	8.0	7.9	7.8	7.4	8.0	8.4	8.6	9.0	8.6	8.4	7.9	8.2	8.2
Wind														
Prevailing direction	2	ne.	ne.	ne.	ne.	ne.	ene.	sw.	sw.	sw.	sw.	ne.	ene.	ne.

TABLE 10.—*Precipitation data, Caroline Islands*

Island	Length of record, years	January	February	March	April	May	June	July	August	September	October	November	December	Annual
						Mean precipitation (in inches)								
Yap	20	6.35	7.29	6.03	5.13	10.13	10.15	15.72	15.76	13.02	11.86	9.46	8.17	119.07
Lamotrek	4	5.69	2.06	5.33	11.58	9.30	10.90	12.85	13.43	6.03	9.90	7.46	9.59	104.12
Truk	7	5.71	8.10	7.28	11.40	12.10	11.38	13.47	12.31	12.67	9.91	11.16	11.87	127.36
Ponape	10	10.41	7.31	11.74	20.26	18.92	15.31	16.83	16.08	15.73	14.56	14.70	15.88	177.73
Kusaie [1]	9	15.40	13.40	15.88	19.27	17.82	17.06	12.34	11.91	12.59	10.39	13.82	16.38	176.26
Kusaie [2]	10	19.00	15.28	27.25	21.35	28.74	22.55	23.93	20.19	24.88	15.57	19.35	16.70	254.79
Korror [3]	9	8.76	7.18	7.87	6.82	11.68	12.03	18.24	15.44	11.04	9.72	13.08	15.29	137.15
						Maximum precipitation in 24 hours (in inches)								
Yap	20	8.23	7.10	5.48	3.36	8.80	6.54	12.57	5.13	3.98	4.61	5.91	5.85	12.57
Lamotrek	4	1.94	1.57	2.87	4.65	3.21	2.99	2.52	3.57	3.15	2.18	4.09	6.08	6.08
Truk	7	2.80	4.76	1.93	4.50	4.25	7.72	4.20	7.38	4.47	4.24	3.74	3.33	7.72
Ponape	10	6.42	9.46	5.04	5.91	5.54	5.63	5.05	4.25	6.64	3.90	5.11	6.06	9.46
Kusaie [1]	9	5.50	6.65	6.34	6.85	5.75	5.94	4.12	6.93	4.29	5.02	5.35	5.32	6.93
Kusaie [2]	10	3.25	4.93	5.40	3.00	4.90	3.90	4.10	6.76	10.43	4.46	8.35	3.25	10.43
Korror	9	3.78	3.91	8.46	4.29	4.72	4.44	6.54	5.47	6.26	3.82	4.17	6.61	8.46
						Mean number of days with precipitation								
Yap	20	18	17	17	18	20	23	25	23	22	22	22	23	250
Lamotrek	4	13	6	8	8	13	18	18	16	14	10	12	12	148
Truk	7	12	14	16	18	23	23	22	22	19	20	19	21	229
Ponape	10	19	16	21	24	26	24	24	24	23	20	23	22	266
Kusaie [1]	9	19	16	21	21	22	22	21	21	18	16	20	22	239
Kusaie [2]	10	21	20	26	25	27	25	28	23	21	20	21	20	280
Korror	9	18	18	15	14	22	22	24	21	18	18	21	23	234

[1] Lelahafen. [2] Mission Station. [3] In the Pelew Islands.

MARSHALL ISLANDS

Two parallel groups of atolls, Ratak and Ralik, constitute the greater part of this subdivision of Micronesia. They are situated immediately east of the Caroline Islands, between latitudes 4° and 15° N. and longitudes 161° and 174° E. Series of observations extending over nearly 20 years are available for two islands of the western group (Ralik): Ujelang (9° 42′ N., 161° 2′ E., elevation 30 feet) and Jaluit (5° 56′ N., 169° 41′ E., elevation 15 feet). The data are published in Mitteilungen aus den deutschen Schutzgebieten (Südsee), 16–27, 30.

The mean annual temperature is 82°, with a difference of about 2° between the extreme monthly means. The northern station, Ujelang, has temperature march of the Northern Hemisphere type with warmer season from May to October, while the southern station, Jaluit, shows the opposite type of march with warmer season from October to February. Maximum temperatures are rather high at Jaluit—95°, or above, in nearly all months of the year. There is a great difference in the amounts of rain received annually; at Ujelang the mean is slightly below 80 inches, while at Jaluit it is nearly 160 inches. Easterly winds prevail throughout the year.

TABLE 11.—*Ujelang, Marshall Islands*

	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Temperature													
Mean maximum	84.4	84.6	85.5	85.8	86.9	87.1	87.6	88.3	88.3	88.2	86.5	85.5	86.6
Mean minimum	76.8	76.6	77.0	77.0	77.7	77.7	77.2	77.4	77.4	77.4	77.2	77.2	77.2
Mean	80.6	80.6	81.2	81.4	82.3	82.4	82.4	82.8	82.8	82.8	81.8	81.4	81.9
Mean, 7a., 2p., 9p., 9p	80.2	80.2	80.8	81.5	81.9	82.0	82.0	82.4	82.0	82.0	81.7	81.1	81.5
Highest	90	91	91	91	90	90	93	94	93	95	92	90	95
Lowest	72	72	73	73	73	73	72	71	73	73	73	72	71
Relative humidity													
Mean, 7a., 2p., 9p	80	80	80	81	83	83	84	84	84	85	84	81	82
Mean, 2p	77	77	76	78	78	79	79	78	80	80	80	78	78
Cloudiness													
Mean, 7a., 2p., 9p	4.5	4.3	4.5	5.0	5.1	5.1	5.2	5.0	5.5	5.5	5.0	4.5	4.8

Means from records for 4 to 7 years during the period 1894–1903.

TABLE 12.—*Jaluit, Marshall Islands, 1892–1895*

	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Temperature													
Mean maximum	88.5	89.4	88.3	88.0	87.4	87.8	88.0	88.9	88.5	90.3	90.3	89.2	88.7
Mean minimum	76.3	76.5	75.9	75.7	75.9	75.6	75.2	75.4	75.2	76.1	76.3	76.3	75.9
Mean	82.4	83.0	82.1	82.0	81.6	81.7	81.6	82.2	81.8	83.2	83.3	82.8	82.3
Mean, 7a., 2p., 9p., 9p	80.6	81.0	80.4	80.2	80.1	80.4	80.2	80.4	80.2	80.6	80.8	80.4	80.4
Highest	98	97	95	94	94	93	95	94	95	97	98	98	98
Lowest	72	72	71	71	71	72	71	71	71	72	70	72	70
Relative humidity													
Mean, 7a., 2p., 9p	85	85	84	86	86	86	85	84	83	82	85	85	85
Mean, 2p	78	77	77	79	80	79	77	75	75	73	77	78	77
Cloudiness													
Mean, 7a., 2p., 9p	6.2	5.9	6.6	6.8	6.7	6.3	6.2	6.0	6.6	6.5	6.8	7.0	6.5

TABLE 13.—*Precipitation data.—Marshall Islands*

Station	January	February	March	April	May	June	July	August	September	October	November	December	Annual
	Mean precipitation (in inches)												
Ujelang I.[1]	2.12	1.78	2.62	5.25	6.63	7.14	8.36	8.46	10.29	10.38	9.55	4.85	77.43
Jaluit I.[2]	10.19	8.53	14.22	15.76	16.57	15.27	15.36	12.04	13.05	12.17	11.89	13.57	158.62
	Maximum precipitation in 24 hours (in inches)												
Ujelang I.[1]	2.44	2.11	6.33	5.66	3.41	7.05	5.70	4.46	5.03	5.20	11.69	3.89	11.69
Jaluit I.[2]	6.85	3.18	6.00	8.15	4.09	6.93	11.06	6.01	4.67	7.27	3.66	7.56	11.06
	Mean number of days with precipitation												
Ujelang I.[1]	13	13	11	16	18	21	23	22	23	23	23	21	227
Jaluit I.[2]	17	13	18	20	23	22	22	20	20	20	20	20	235

[1] 17-year record in the period 1894–1913.
[2] 17-year record in the period 1892–1913.

GILBERT ISLANDS

The low, coral islands of this group, situated southeast of the Marshall Islands, form the eastern subdivision of Micronesia. They lie in the immediate vicinity of the Equator near latitude 175° E.

Meteorological data are given for the following: Apaiang (1° 43′ N., 173° 2′ E., elevation 10 feet), Nauru (0° 26′ S., 166° 58′ E., elevation 26 feet), and Ocean Island (0° 52′ S., 169° 35′ E., elevation 85 feet).

Monthly temperatures vary but little from the annual mean of 82° to 83°; maximum temperatures for the different months range from 92° to 96° at Ocean Island and from 96° to 99° at Nauru; minimum temperatures fall to 70° or slightly lower. From 80 to 90 inches of rain are received annually; the amounts are generally greatest from December to February. East winds prevail; northeast and southeast winds are frequent.

The means for Apaiang and Nauru are derived from data in Mitteilungen aus den deutschen Schutzgebieten (Südsee), 30; those for Ocean Island from the Quarterly Journal of the Royal Meteorological Society (London), volume 44.

TABLE 14.—*Nauru, Gilbert Islands*

	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Temperature													
Mean maximum	88.9	88.7	90.5	90.3	91.2	90.1	89.8	90.3	91.0	91.0	90.7	90.1	90.2
Mean minimum	77.4	77.2	77.2	76.5	76.5	76.1	75.9	75.6	75.4	76.6	76.8	76.8	76.5
Mean	83.2	83.0	83.8	83.4	84.0	83.1	82.8	83.0	83.2	83.8	83.8	83.4	83.4
Mean, 7a, 2p, 9p	82.4	81.9	82.4	82.8	83.1	82.4	82.2	82.6	83.3	83.1	82.8	82.4	82.6
Highest	97	96	97	97	97	96	96	98	97	99	98	97	99
Lowest	71	71	71	70	71	71	71	70	70	68	70	71	70
Relative humidity													
Mean, 7a., 2p., 9p	80	82	80	80	80	81	80	80	77	77	79	80	80
Mean, 2p	71	74	71	71	70	72	71	71	67	67	70	72	71
Cloudiness													
Mean, 7a., 2p., 9p	4.7	5.4	4.5	4.2	4.0	4.2	4.3	3.8	3.6	3.6	4.3	4.8	4.3

Means for 4 to 11 years in the period 1894–1906.

TABLE 15.—*Ocean Island, Gilbert Islands, 1905–1916*

	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Temperature													
Mean maximum	88.8	88.9	88.6	88.7	88.6	88.5	88.1	88.4	88.8	89.0	89.2	89.1	88.7
Mean minimum	75.7	75.6	75.9	75.8	75.6	76.0	75.9	76.2	75.6	75.9	75.9	75.8	75.8
Mean	82.2	82.2	82.2	82.2	82.1	82.2	82.0	82.3	82.2	82.4	82.6	82.4	82.2
Mean, 24 hours	81.3	81.2	81.2	81.1	80.8	81.1	80.9	81.1	80.9	81.0	81.2	81.3	81.1
Highest	95	93	92	96	92	92	93	95	93	92	93	93	96
Lowest	69	70	68	70	70	70	70	71	70	70	70	70	68

TABLE 16.—*Precipitation data, Gilbert Islands*

Stations	January	February	March	April	May	June	July	August	September	October	Noyember	December	Annual
					Mean precipitation (in inches)								
Apaiang I.[1]	13.61	6.00	8.00	11.06	6.55	6.87	6.79	2.90	2.13	10.24	6.64	7.28	88.07
Nauru I.[2]	8.64	11.06	6.46	5.49	5.73	4.98	6.74	6.08	6.51	5.27	6.78	10.48	84.22
Ocean I.[3]	12.88	9.03	8.43	8.49	6.07	5.13	5.67	2.67	3.90	4.80	5.74	8.03	80.84
					Maximum precipitation in 24 hours (in inches)								
Apaiang I.[1]	4.08	3.24	6.52	5.93	3.49	4.54	3.36	2.46	2.28	7.99	1.76	3.24	7.99
Nauru I.[2]	4.65	7.72	6.00	3.90	4.70	2.99	3.99	4.02	4.85	4.39	6.54	5.60	7.72
Ocean I.[3]	4.55	6.73	5.02	4.76	5.34	3.96	6.71	2.33	3.27	3.35	3.98	4.54	6.73
					Mean number of days with precipitation								
Apaiang I.[1]	18	10	13	17	11	13	12	9	7	13	13	17	153
Nauru I.[2]	14	14	14	13	16	12	15	15	13	8	12	14	160
Ocean I.[3]	19	14	14	13	12	11	13	11	11	11	11	13	153

[1] 1905–1907.
[2] 16-year record in the period 1893–1913.
[3] 1905–1916.

BONIN ISLANDS

These islands, not included in Micronesia, are situated midway between the Marianne Islands and Japan. Monthly records for Chichijama (Peel Island) appear in the annual reports of the Central Meteorological Observatory of Japan, 1906–1919.

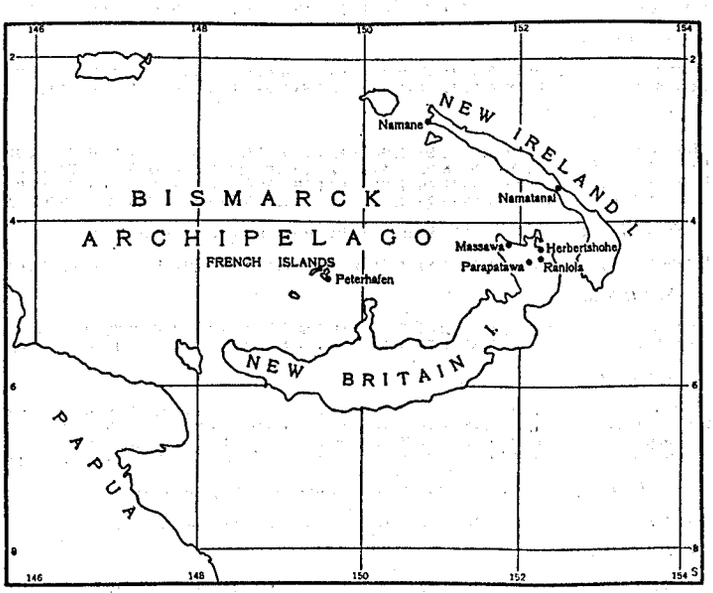
MELANESIA

Melanesia, the "black islands," so-called from the color of the natives, extends from the equatorial region northeast of Papua southeastward nearly to the Tropic of Capricorn. There is great contrast between this region and Micronesia. In nearly all of the Melanesian groups there are one or more islands of relatively large extent, some having rather lofty elevations. The land is mainly of volcanic origin, and volcanic activity occurs in some regions. Coral formation, occurring mainly as reef is found mostly in the extreme northern and southern portions of the area. The hilly, or even rugged surfaces, covered with luxuriant tropical vegetation, form the outstanding feature in the contrast with the preceding grand division of the islands of the Pacific.

Meteorological observations are available for stations in the following groups: Bismarck Archipelago, Solomon, New Hebrides, and Loyalty Islands, New Caledonia, and the Fiji Islands, and also for the Trobriand Islands and Woodlark Island.

BISMARCK ARCHIPELAGO

In this most western of the Melanesian groups, lying just northeast of Papua between 1° and 7° south latitude and 146° and 153° east longitude, meteorological records have been kept at a number of stations as shown in a table in Mitteilungen aus den deutschen Schutzgebieten (Südsee), 30. Data are presented here for Peterhafen in the French Islands, Namane and Namatanai in New Ireland, Massawa, Herbertshohe (4° 20′ S., 152° 17′ E., elevation about 200 feet), Raniola, and Parapatawa in the extreme northern part of New Britain.



Records for meteorological elements other than precipitation are available only for the neighboring stations of Herbertshohe and Ralum; the values given in the table for the former station may probably be considered as representative of conditions over the entire region. In the French Islands the mean annual precipitation is about 125 inches; in New Ireland, 105 inches; in northern New Britain there is considerable difference in annual precipitation within short distances, the extremes being about 75 inches at Herbertshohe and 100 inches at Parapatawa.

The values in the precipitation table are compiled from records in Mitteilungen aus den deutschen Schutzgebieten, 15–27, 30.

TABLE 17.—*Herbertshohe, New Britain*

	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Temperature													
Mean maximum	87.4	86.4	86.5	87.8	88.0	87.6	87.1	86.7	88.0	88.7	88.3	88.0	87.5
Mean minimum	73.6	73.4	73.6	73.8	73.8	78.6	72.7	72.5	72.7	72.9	73.4	73.6	73.3
Mean	80.5	79.9	80.0	80.8	80.9	80.6	79.9	79.6	80.4	80.8	80.8	80.8	80.4
Mean, 24 hours	79.0	78.8	78.8	79.2	79.3	78.6	77.9	77.9	78.6	79.2	79.2	79.5	78.8
Highest	94	92	91	94	91	92	94	94	97	95	95	94	97
Lowest	70	70	70	70	71	70	68	68	70	70	68	66	66
Relative humidity													
Mean, 7a., 2p., 9p	83	84	83	83	81	81	80	81	79	78	78	82	81
Mean, 2p	74	77	75	76	71	72	72	72	70	68	72	75	73
Cloudiness													
Mean, three observations	6.4	7.9	6.4	6.0	5.4	6.4	6.8	6.5	6.1	5.9	6.1	6.6	6.4

Temperature data are based on the somewhat fragmentary record for the period 1902–1912; means for relative humidity and cloudiness on continuous record for the years 1902–1905.

TABLE 18.—*Precipitation data, Bismarck Archipelago*

Stations	January	February	March	April	May	June	July	August	September	October	November	December	Annual
French Islands	Mean precipitation (in inches)												
Peterhafen [1]	15.63	11.94	17.91	13.80	10.27	6.08	6.49	4.23	5.70	6.92	13.65	17.63	130.25
New Ireland													
Namane [2]	10.77	8.76	11.13	9.38	8.09	5.88	6.61	8.39	6.72	6.65	9.46	11.22	103.06
Namatanai [3]	15.58	7.97	17.54	11.92	5.65	7.84	5.99	5.08	4.73	6.07	9.67	12.54	110.57
New Britain													
Massawa [4]	12.89	12.31	12.92	7.04	5.85	4.50	4.26	5.12	5.63	4.68	7.63	10.48	93.31
Herbertshohe [5]	8.20	6.95	8.92	5.43	4.37	5.75	6.02	6.34	3.93	3.39	6.20	7.99	73.51
Raniola [6]	9.80	8.16	11.56	7.24	5.03	4.30	5.76	6.04	5.27	4.50	6.13	10.26	84.05
Parapatawa [7]	12.59	7.99	10.70	11.02	7.51	5.39	7.13	6.96	4.88	6.88	10.29	10.88	102.22
French Islands	Maximum precipitation in 24 hours (in inches)												
Peterhafen [1]	7.83	4.72	7.83	4.72	4.80	4.52	3.86	2.76	3.50	2.48	5.51	11.02	11.02
New Ireland													
Namane [2]	2.95	2.99	2.68	3.15	2.60	2.60	3.39	3.90	2.79	2.87	2.72	2.36	3.90
Namatanai [3]	3.82	3.35	4.79	3.41	2.93	3.50	4.61	2.20	2.05	3.35	3.13	6.26	8.82
New Britain													
Massawa [4]	7.16	5.75	7.20	4.83	5.24	4.25	5.43	4.09	3.90	4.02	4.49	6.02	7.20
Herbertshohe [5]	4.42	3.78	3.43	2.94	3.65	3.63	4.92	6.56	4.92	4.00	4.39	3.63	6.56
Raniola [6]	6.54	4.57	5.24	3.54	3.86	3.94	7.16	3.74	7.52	3.74	3.54	6.57	7.52
Parapatawa [7]	4.96	4.33	3.35	6.26	3.62	2.56	5.55	6.26	3.54	6.42	2.68	4.61	6.42
French Islands	Mean number of days with precipitation												
Peterhafen [1]	23	16	22	17	13	13	12	11	10	12	18	19	186
New Ireland													
Namane [2]	22	16	22	18	17	14	15	15	13	14	17	19	202
Namatanai [3]	25	16	23	18	13	16	14	15	11	16	20	19	206
New Britain													
Massawa [4]	17	16	17	12	11	11	11	11	10	10	11	13	150
Herbertshohe [5]	18	19	19	15	11	12	13	14	10	12	14	17	174
Raniola [6]	18	16	19	15	12	12	11	11	10	12	14	17	167
Parapatawa [7]	18	16	19	17	10	10	13	12	12	12	14	18	171

[1] 10-year record in the period 1903–1913.
[2] 5-year record in the period 1905–1913.
[3] 7-year record in the period 1906–1913.
[4] 12-year record in the period 1900–1913.
[5] 9-year record in the period 1902–1913.
[6] 19-year record in the period 1891–1913.
[7] 10-year record in the period 1902–1911.

TROBRIAND ISLANDS AND WOODLARK ISLAND

Precipitation data for Losuia (8° 30′ S., 151° 15′ E.) in the Trobriand Islands and Bonagai (9° 0′ S., 153° 0′ E.) on Woodlark Island are given in the Government Gazette, Territory of Papua, 1908–1922.

The records are summarized in the table for the Solomon Islands.

SOLOMON ISLANDS

This archipelago, in which there are seven islands of considerable size, extends from the vicinity of New Britain of the Bismarck Archipelago southeastward over a distance of more than 600 miles.

The only temperature records available are those for Tulagi (9° 5′ S., 160° 8′ E., elevation, 7 feet) published in the Réseau Mondial, 1910–1918. At this station the mean annual temperature is 82°; the temperature march is that of the Southern Hemisphere with extreme monthly means of 83.2° in December and 80.6° in August; the highest and lowest temperatures recorded in the nine-year period (1910–1918) were 97° and 70°, respectively.

Rainfall stations are fairly well distributed over the area. The data on precipitation are found in the following publications: Kieta (Bougainville), in Mitteilungen aus den deutschen Schutzgebieten (Südsee), 20–27; Pepesala, Lunga, and Kau Kau, in Results of Rainfall Observations in Queensland, Appendix I; Rendova and Tulagi, in the volume just mentioned and, for recent years, in the Réseau Mondial.

The mean annual precipitation for this region is about 135 inches; the extreme values of 94 inches at Lunga and 180 inches at Kau Kau, both on Guadalcanar Island, are very probably related to marked difference in exposure. Over most of this archipelago there is a well-defined maximum of rainfall from January to March, inclusive, and monthly means are generally least from June to August.

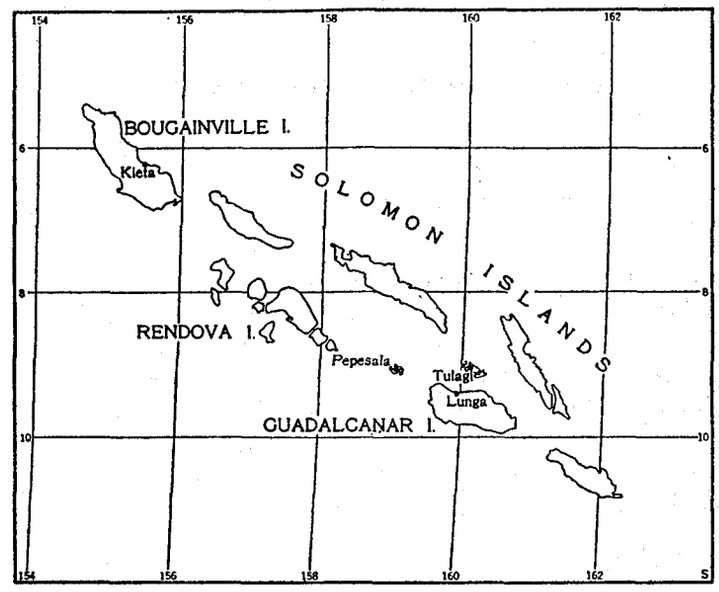


TABLE 19.—*Tulagi, Solomon Islands, 1910–1918*

	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Temperature													
Mean maximum	88.9	88.2	88.9	88.7	87.4	86.4	86.0	85.5	86.2	87.1	88.7	89.8	87.6
Mean minimum	76.5	75.9	75.7	76.1	76.5	76.1	76.1	75.7	76.3	76.1	76.3	76.5	76.2
Mean	82.7	82.0	82.3	82.4	82.0	81.2	81.0	80.6	81.2	81.6	82.5	83.2	81.9
Highest	95	96	96	95	93	93	91	92	94	93	95	97	97
Lowest	70	70	71	71	70	72	72	72	73	72	71	72	70

TABLE 20.—*Mean monthly and annual precipitation, Solomon Islands*

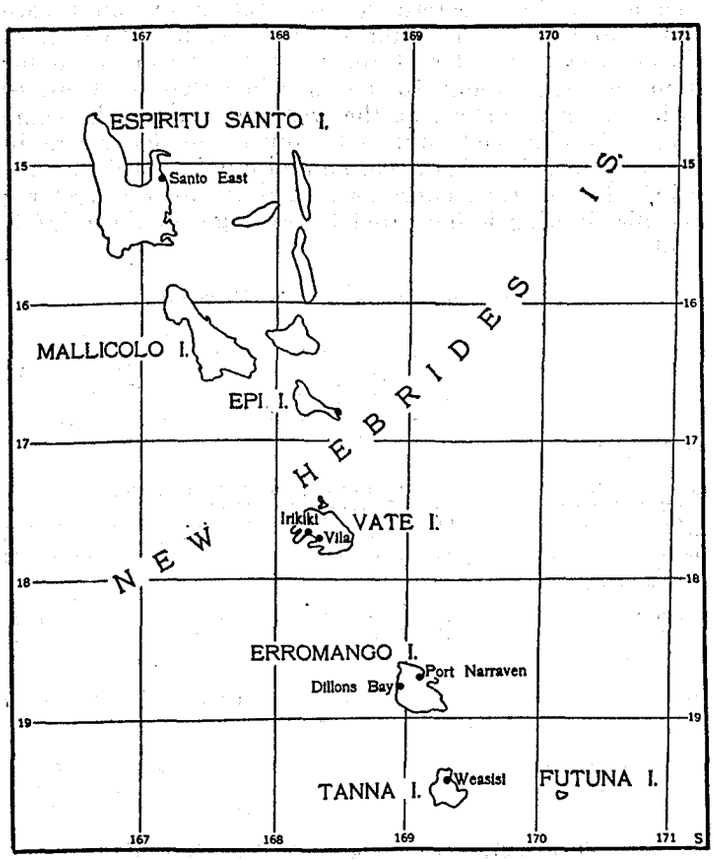
Stations	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Kieta [1]	12.70	9.46	14.29	8.34	8.16	8.11	10.98	10.34	9.38	8.67	11.57	8.35	120.35
Rendova [2]	18.61	18.72	20.90	11.27	12.74	13.76	12.65	14.58	12.42	14.46	12.84	11.84	174.79
Pepesala [3]	20.54	16.87	20.09	7.47	9.07	8.22	5.04	4.75	6.18	8.43	8.21	11.98	126.85
Tulagi [4]	13.44	16.18	16.45	8.24	7.50	5.66	6.26	6.86	7.74	7.91	8.48	10.65	115.37
Lunga [5]	15.31	12.64	17.63	6.37	5.40	4.81	3.26	3.21	4.22	5.09	6.35	9.71	94.00
Kau Kau [6]	13.64	10.35	11.84	12.04	16.70	17.76	22.03	18.81	13.62	21.47	12.90	8.47	179.63
Losuia [7]	13.29	17.65	18.75	14.22	15.42	12.88	9.61	9.01	9.09	9.03	11.71	10.68	151.34
Bonagai [8]	16.23	15.54	17.44	14.16	12.57	12.65	15.26	12.66	17.31	10.93	11.45	13.12	169.32

[1] 6-year record in the period 1906–1913.
[2] 1907–1918.
[3] 1906–1912.
[4] 1898–1918.
[5] 1906–1912.
[6] 1908–1912 (on Guadalcanar Island; location not given on maps).
[7] 12-year record in the period 1908–1922. Station in the Trobriand Islands.
[8] 10-year record in the period 1908–1920. Station on Woodlark Island.

NEW HEBRIDES ISLANDS

Most of the islands are small; Esperitu Santo at the north is the only one that compares in size with the rather large islands of the Solomon group.

Temperature data are available only for the southern half of the region. Here the mean annual temperature is about 77°; the warmest season, January–March, has a mean of 81° and the coldest, July–August, 72°. This difference of 9° is considerably greater than the corresponding value for the Solomon Islands (Tulagi, 3°), and the region may be considered as having temperature seasons. At Port Vila, on Vate Island, maximum temperatures of 95° and over have been recorded in the months from November to April and minimum temperatures slightly above 50° from June to October.



The average amount of rainfall received annually is about 90 inches. The distribution is not uniform, and it is very probable that contrasts, such as that between Port Narraven (132 inches) and Dillons Bay (60 inches), on Erromango Island, are to be found in other parts of the area. The season of heavy precipitation begins in November or December and ends in April or May and shows a rather marked contrast to the season of moderate precipitation, which includes the other months.

TABLE 21.—*Port Vila–La Kolle, New Hebrides Islands* [1]

	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Temperature													
Mean maximum	89.1	89.6	90.0	87.3	83.5	81.5	80.2	79.9	82.2	86.0	87.3	88.7	85.4
Mean minimum	71.6	70.7	70.0	69.8	66.2	65.5	62.1	62.8	63.5	63.9	68.2	68.9	66.9
Mean	80.4	80.2	80.0	78.6	74.8	73.5	71.2	71.4	72.8	75.0	77.8	78.8	76.2
Highest	97	98	96	95	92	91	88	88	93	94	97	96	98
Lowest	64	63	65	62	59	54	53	53	54	54	57	60	53

[1] Port Vila, 1906–1907; La Kolle, 1910–1911. Annales du Bureau Central Météorologique de France.

TABLE 22.—*Futuna, New Hebrides Islands, 1867–1876* [1]

	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Temperature													
Mean maximum	89.6	89.8	88.5	86.9	83.7	81.7	81.9	81.9	83.5	85.3	86.2	88.2	85.6
Mean minimum	72.7	74.3	73.2	70.9	69.8	65.1	64.8	64.0	64.6	66.9	69.6	71.4	68.9
Mean	81.2	82.0	80.8	78.9	76.8	73.4	73.4	73.0	74.0	76.1	77.9	79.8	77.3
Relative humidity													
Mean, 6a., 1p., 9 p	86	87	85	86	83	81	84	81	80	83	84	83	84
Cloudiness													
Mean, three observations	5.5	5.2	4.9	5.7	5.2	5.9	5.6	5.0	5.2	5.9	4.7	4.8	5.2

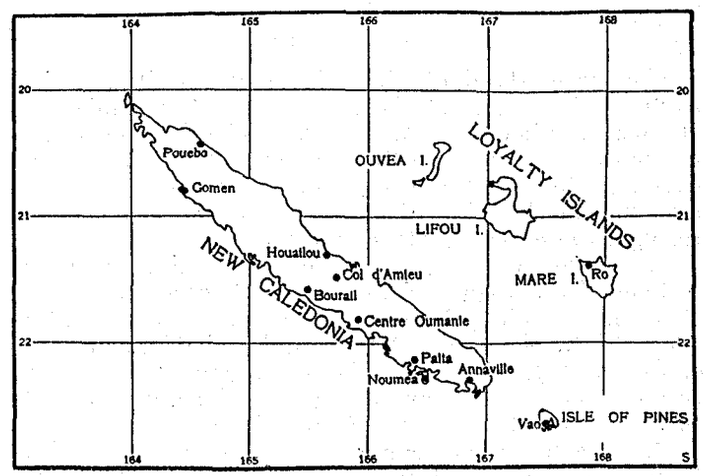
[1] Meteorologische Zeitschrift, 1891.

TABLE 23.—*Precipitation data, New Hebrides Islands*

Stations	January	February	March	April	May	June	July	August	September	October	November	December	Annual
	Mean precipitation (in inches)												
Santo East [1]	15.76	15.99	10.31	10.74	13.08	6.58	5.10	5.67	8.31	6.42	10.04	12.12	120.12
Epi [1]	13.94	10.18	9.54	10.08	7.65	4.28	4.40	4.82	5.60	5.53	8.05	5.78	89.85
Irikiki [2]	11.82	8.83	12.68	9.77	4.93	2.35	2.30	2.93	6.67	3.80	11.44	9.15	86.67
Port Narraven [3]	21.01	12.04	18.84	11.63	10.81	6.60	6.29	8.90	8.93	6.88	8.88	11.73	132.54
Dillons Bay [4]	11.60	8.03	10.34	5.96	4.75	2.12	2.77	1.34	2.57	2.13	3.80	5.14	60.55
Weasisi [5]	12.28	9.38	12.88	9.91	5.79	4.84	3.58	4.97	4.42	8.22	6.92	8.79	91.98
Futuna [6]	10.65	11.73	6.27	7.72	5.04	5.20	3.64	5.89	3.90	3.27	4.30	5.98	73.59
	Mean number of days with precipitation												
Santo East [1]	----	----	----	----	----	----	----	----	----	----	----	----	189
Epi [1]	----	----	----	----	----	----	----	----	----	----	----	----	226
Irikiki [7]	18	16	16	17	16	14	7	14	13	12	15	15	173
Port Narraven [3]	----	----	----	----	----	----	----	----	----	----	----	----	174
Dillons Bay [4]	----	----	----	----	----	----	----	----	----	----	----	----	123
Weasisi [5]	23	16	26	20	18	12	14	16	13	12	14	18	202
Futuna [6]	20	18	20	17	19	18	14	14	13	13	13	16	195

[1] 1905–1912.
[2] 1905–1907, 1909–1912.
[3] 1906–1912.
[4] 1905–1910.
[5] 1885–1887, 1889–1894.
[6] 7-year record in the period 1868–1876.
[7] 4-year record at Port Vila-LaKolle.

Data for Futuna are taken from Meteorologische Zeitschrift, 1891; those for the other stations from Results of Rainfall Observations in Queensland, Appendix I (1914).



LOYALTY ISLANDS

These islands lie immediately west of the southern New Hebrides, off the coast of New Caledonia. Climatic tables compiled from records in Annales du Bureau Cen-

tral Météorologique de France are given here for Lifou (20° 45′ S., 167° 2′ E.) and Ro-Mare (21° 23′ S., 167° 52′ E.).

The mean annual temperature is 74°, slightly lower than that of the New Hebrides Islands. The mean annual precipitation averages about 60 inches; mean monthly rainfall is 6 to 9 inches from January to April, inclusive; in the remaining months it is much less, with minimum of less than 3 inches in November and December.

TABLE 24.—*Lifou, Loyalty Islands, 1908–1914*

	Length of record, years	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Temperature														
Mean maximum	3	86.7	85.6	83.8	82.0	77.5	75.6	75.0	74.8	77.5	79.3	82.2	86.0	80.5
Mean minimum	3	71.6	73.0	71.2	68.7	65.7	63.0	61.0	61.3	64.6	63.7	66.7	66.9	66.4
Mean	3	79.2	79.3	77.5	75.4	71.6	69.3	68.0	68.0	71.0	71.5	74.4	76.4	73.5
Precipitation														
Mean	7	8.60	8.48	9.67	10.40	4.01	3.62	5.44	3.88	3.49	2.63	2.71	2.40	65.33
Mean number of rainy days	7	13	12	14	10	8	8	9	7	8	6	6	7	108

TABLE 25.—*Ro-Mare, Loyalty Islands, 1908–1913*

	Length of record, years	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Temperature														
Mean maximum	2	90.9	90.5	87.6	85.1	83.4	79.2	79.2	79.5	81.1	82.3	86.0	89.8	84.6
Mean minimum	2	69.8	71.2	69.3	67.6	65.8	63.0	62.6	60.1	62.6	62.2	64.8	64.8	65.3
Mean	2	80.4	80.8	78.4	76.4	74.6	71.1	70.9	69.8	71.8	72.2	75.4	77.3	74.9
Relative humidity														
Mean, 7a., 2p., 9p	2	81	81	82	82	83	79	83	81	78	75	77	76	80
Mean, 2p	2	75	76	76	75	72	71	74	73	70	67	69	68	73
Cloudiness														
Mean, 3 observations	2	6.2	5.1	5.2	5.4	5.5	4.3	5.2	4.7	5.2	5.4	5.2	4.8	5.2
Precipitation														
Mean	4	6.69	3.30	9.19	5.10	3.87	4.52	4.92	4.88	4.40	3.13	1.75	2.43	54.18
Mean number of rainy days	4	13	9	11	10	9	9	10	10	10	8	6	7	112

NEW CALEDONIA

The large island of New Caledonia is situated just north of the Tropic of Capricorn about 1,000 miles east of Australia; it has a length of 250 miles from northwest to southeast and a width of about 30 miles. A very irregular, but continuous, mountain chain with peaks reaching an elevation of more than 5,000 feet stretches through the entire length of the island.

The meteorological records for this region appear in Annales du Bureau Central Météorologique de France. Pouebo, Houailou, Noumea near sea level (22° 16′S., 166° 27′ E. elevation 30 feet) and Col d'Amieu at an elevation of 1,150 feet are chosen to represent temperature conditions, and several other stations are added to these to show distribution of precipitation.

The mean annual temperature ranges from 76° at Pouebo near the northwestern extremity to 69° at the elevated station of Col d'Amieu near the middle of the island; the monthly means are highest in February (75° to 80°) and lowest in August (62° to 70°). The temperature extremes recorded at Noumea in a period of 22 years are 99° and 52°.

Precipitation is much the heavier on the eastern side of the island; the effect of the high mountain chain appears in the annual means for the eastern and western coasts, which are 96 and 46 inches, respectively, and in the much greater contrast between the annual means of 109 inches at Annaville and 33 inches at Centre-Ouamenie. At the eastern stations rainfall amounts are much greater from January to June, inclusive, than during the remainder of the year, the mean depth for January being about 15 inches, while that for October is less than 3 inches; at the western stations the same march is observed, but with much smaller range in monthly means. The mean annual number of days with rain is 160 for the eastern coast and 110 for the western; the distribution is indicated by averages in the rainfall tables.

TABLE 26.—*Noumea, New Caledonia*

	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Temperature													
Mean maximum [1]	85.6	85.3	85.0	82.8	79.2	76.8	75.7	75.9	78.1	80.1	82.8	85.5	81.1
Mean minimum [1]	72.4	72.6	72.0	70.0	66.0	63.8	61.7	61.2	62.6	64.6	68.2	70.5	67.1
Mean [1]	79.0	79.0	78.5	76.4	72.6	70.3	68.7	68.6	70.4	72.4	75.5	78.0	74.1
Highest [2]	97	99	95	96	91	89	87	85	90	93	94	98	99
Lowest [2]	64	64	63	61	56	55	52	54	55	56	60	63	52
Relative humidity [1]													
Mean, 9a	72	75	76	77	75	76	76	72	70	68	69	70	73
Mean, 3p	70	72	73	74	71	70	69	68	67	66	67	68	70
Cloudiness [1]													
Mean, 9a, 3p	4.4	4.3	4.0	4.4	4.4	4.6	4.3	4.2	4.2	4.0	4.4	3.8	4.2
Wind													
Prevailing direction [1]	e.	e.	e.	e.	e.	e.	e.	e.	e.	e.	e.	e.	e.

[1] 1905–1914. [2] 1891–1914.

TABLE 27.—*Temperature data, New Caledonia*

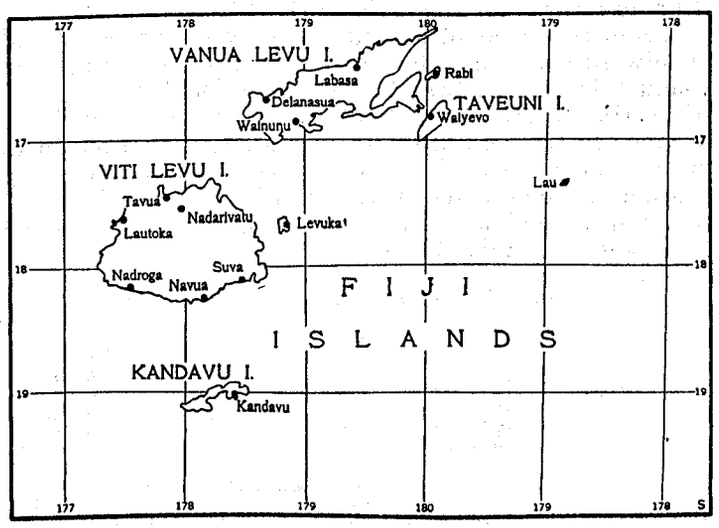
Stations	January	February	March	April	May	June	July	August	September	October	November	December	Annual
	Mean maximum temperature												
Pouebo [1]	87.8	89.2	88.7	87.1	83.7	80.6	79.7	80.6	81.7	83.8	86.4	88.5	84.8
Noumea [2]	85.6	85.3	85.0	82.8	79.2	76.8	75.7	75.9	78.1	80.1	82.8	85.5	81.1
Houailou [1]	84.9	86.2	86.0	84.9	81.9	79.7	78.8	79.3	80.2	82.2	84.0	85.3	82.8
Col d'Amieu [3]	84.2	85.1	83.8	80.8	76.6	75.2	74.1	73.4	77.4	81.0	83.7	84.7	80.0
	Mean minimum temperature												
Pouebo [1]	70.5	71.6	70.5	69.3	65.5	63.5	61.7	59.7	62.2	64.0	66.4	68.7	66.1
Noumea [2]	72.4	72.6	72.0	70.0	66.0	63.8	61.7	61.2	62.6	64.6	68.2	70.5	67.1
Houailou [1]	69.1	69.3	68.9	67.6	62.1	59.2	58.3	55.2	58.2	60.3	63.1	66.0	63.1
Col d'Amieu [3]	64.6	65.5	64.9	63.5	57.2	54.7	52.5	51.1	54.1	55.8	59.0	61.2	58.7
	Mean temperature												
Pouebo [1]	79.2	80.4	79.6	78.2	74.6	72.0	70.7	70.2	72.0	73.9	76.4	78.6	75.5
Noumea [2]	79.0	79.0	78.5	76.4	72.6	70.3	68.7	68.6	70.4	72.4	75.5	78.0	74.1
Houailou [1]	77.0	77.8	77.4	76.2	72.0	69.4	68.6	67.2	69.2	71.2	73.6	75.6	72.9
Col d'Amieu [3]	74.4	75.3	74.4	72.2	66.9	65.0	63.3	62.2	65.8	68.4	71.4	73.0	69.4

[1] 1909–1914. [2] 1905–1914. [3] 1909–1912.

TABLE 28.—*Precipitation data, New Caledonia*

Stations	January	February	March	April	May	June	July	August	September	October	November	December	Annual
						Mean precipitation (in inches)							
Pouebo [1]	17.27	14.66	14.40	7.85	6.84	6.10	4.14	2.62	5.25	2.06	6.62	6.97	94.78
Gomen [1]	9.57	8.07	7.61	3.32	3.13	3.41	2.51	1.70	2.03	0.65	2.15	3.32	47.47
Houailou [2]	14.11	8.87	12.73	9.32	5.54	9.17	5.63	3.89	3.99	1.60	5.39	4.88	85.12
Col d'Amieu [3]	11.94	18.14	10.54	7.35	6.44	2.94	3.49	4.23	2.41	1.84	2.74	6.28	78.34
Bourail [2]	6.62	6.95	7.57	3.65	5.67	4.99	3.27	2.91	1.50	1.00	2.32	3.02	49.47
Centre-Oumanie [4]	3.82	4.44	4.28	2.40	2.86	4.70	2.48	2.19	1.15	0.88	1.95	1.45	32.60
Paita [5]	4.93	7.14	5.46	3.99	3.50	5.30	3.91	3.02	1.65	1.33	2.64	3.15	46.02
Noumea [6]	3.79	4.77	5.81	5.13	4.50	3.63	3.69	2.69	2.46	2.06	2.35	2.64	43.52
Annaville [7]	12.56	14.59	9.04	16.22	12.72	10.63	4.07	7.40	9.65	2.53	6.44	3.46	109.31
Vao [8]	4.30	1.97	5.43	4.76	6.46	1.27	5.96	6.25	2.03	0.64	2.35	3.87	45.29
						Mean number of days with precipitation							
Pouebo [1]	21	17	20	18	11	10	12	8	11	11	13	16	168
Gomen [1]	16	11	12	10	8	5	8	6	5	4	5	8	98
Houailou [2]	18	15	17	14	9	11	10	8	8	7	7	9	133
Col d'Amieu [3]	18	16	22	16	15	12	15	12	10	9	12	11	168
Bourail [2]	15	13	15	13	11	10	11	10	6	5	7	7	123
Centre-Oumanie [4]	10	8	7	5	6	5	7	7	3	3	4	4	69
Paita [5]	12	11	12	12	13	13	12	13	7	7	7	7	126
Noumea [6]	10	12	15	13	15	12	13	12	8	7	7	6	130
Annaville [7]	22	22	18	21	18	16	14	14	16	11	12	9	193
Vao [8]	10	13	12	12	15	11	17	13	8	4	4	10	129

[1] 1909–1914.
[2] 1908–1914.
[3] 5-year record in the period 1909–1914.
[4] 1905–1914.
[5] 1903–1914.
[6] 1860–1914, record practically complete.
[7] 3-year record in the period 1908–1911.
[8] 1911–1914. Station on Isle of Pines.



FIJI ISLANDS

This well-known archipelago, the most eastern subdivision of Melanesia, lies near the intersection of the parallel of 20° S. with the meridian of 180°. The smaller islands are low and of coral formation; the larger ones, the most important of which are Viti Levu and Vanua Levu with areas of 4,200 and 2,600 square miles, respectively, are of volcanic origin and have considerable elevation, some of the peaks in this region rising above 3,000 feet.

The data presented here are from the Quarterly Journal of the Royal Meteorological Society (London), volumes 7, 11, 12, and 13, issues of the Report of the Department of Agriculture, Fiji, and Meteorological Observations at Suva.

Near sea level the mean annual temperature averages 78°; from December to March monthly means are about 80°, while in the colder season, July and August, these range from 77° at the north to 74° at the south. At Delanasua and Suva temperatures above 90° have been recorded in all months of the year, the extremes being 99° and 98°, respectively, while minimum temperatures slightly below 60° have occurred in the months from June to September.

On account of the mountainous character of the larger islands there is marked difference in the amount of precipitation received in different parts of their areas. The wet districts consist of the coast with interior flats from south to east and the central elevations; the dry districts, of the coasts and flats from west to northeast; in each case the amount of rainfall increases with greater elevation.

In Viti Levu the extremes of mean annual precipitation are 143 inches at Navua and 65 inches at Lautoka; in Vanua Levu these are 150 inches at Wainunu and 80 inches at Labasa. The elevated station of Nadarivatu in northern Viti Levu (2,600 feet) receives an average of 132 inches rain yearly. In the remainder of the Fiji region the mean annual precipitation ranges from about 70 inches at Lau and Kandavu to 160 inches at Rabi.

The wet season lasts from November to April, with maximum rainfall from January to March; in this period the mean monthly amounts are 8 to 24 inches, according to location. In the middle of the dry season the monthly means fall below 2 inches at some stations in the dry districts, but there is abundant rainfall (5 to 10 inches) in the wet districts.

TABLE 29.—*Temperature data, Fiji Islands*

Stations	Length of record, years	January	February	March	April	May	June	July	August	September	October	November	December	Annual
							Mean maximum temperature							
Lautoka	7	88.2	87.6	88.3	88.7	85.9	84.8	84.0	83.4	85.5	86.5	87.2	88.1	86.5
Levuka	13	85.3	85.3	85.7	85.2	83.0	81.4	80.6	80.0	79.6	80.8	83.1	84.4	82.9
Suva	33	85.8	86.5	86.0	84.3	81.8	83.0	79.2	79.2	80.2	81.5	82.8	84.8	82.7
							Mean minimum temperature							
Lautoka	7	73.8	73.5	73.8	72.3	70.4	68.0	66.9	67.2	68.3	69.6	71.6	73.2	70.7
Levuka	13	75.1	75.8	75.5	75.0	74.0	72.9	71.3	69.9	70.3	71.7	72.9	74.1	73.2
Suva	33	74.0	74.4	74.1	73.1	71.3	69.4	68.0	68.2	68.9	70.5	71.6	73.1	71.4
							Mean temperature							
Delanasua	15	80.7	80.5	80.4	80.0	79.3	77.7	76.8	77.3	77.8	79.1	80.1	81.1	79.2
Lautoka	7	81.0	80.6	81.0	80.5	78.2	76.4	75.4	75.3	76.9	78.0	79.4	80.6	78.6
Levuka	13	80.2	80.6	80.6	80.1	78.5	77.2	76.0	75.0	75.0	76.2	78.0	79.2	78.0
Suva	33	79.9	80.4	80.0	78.6	76.6	74.8	73.6	73.7	74.6	76.0	77.2	79.0	77.0
							Highest temperature							
Delanasua	15	99	95	98	94	96	92	92	93	93	96	97	98	99
Levuka	8	93	94	93	91	91	89	86	87	88	89	92	93	94
Suva	33	95	97	98	94	93	90	90	90	90	93	93	96	98
							Lowest temperature							
Delanasua	15	67	68	68	65	60	58	58	57	56	60	63	67	56
Levuka	8	69	70	71	71	68	62	62	62	66	66	68	71	62
Suva	33	67	67	66	61	61	58	58	57	57	62	62	62	57

TABLE 30.—*Precipitation data, Fiji Islands*

Stations	Length of record, years	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Mean precipitation (in inches)														
Labasa	24	12.72	14.14	13.54	8.12	4.26	2.32	1.94	1.86	2.71	3.20	5.14	10.12	80.07
Delanasua	40	16.97	14.18	16.20	9.21	4.58	2.37	1.76	2.81	3.38	5.25	6.57	9.58	92.86
Wainunu	39	18.95	17.48	18.49	15.27	11.47	6.62	5.67	6.86	9.27	11.16	12.11	16.11	149.46
Rabi	14	20.06	16.76	20.43	17.63	15.81	8.04	4.85	7.98	8.99	9.67	11.92	18.67	160.81
Waiyevo	12	12.51	12.95	13.63	9.70	9.50	5.57	2.16	3.92	5.50	7.15	9.15	12.44	104.18
Lau	23	7.95	7.67	8.65	7.62	5.53	4.64	2.74	3.39	3.44	5.17	6.18	6.94	69.92
Levuka	24	9.43	10.22	12.71	9.27	7.25	4.72	3.61	5.88	4.51	5.50	8.07	9.03	90.20
Tavua	12	10.54	14.90	11.76	5.37	4.01	2.14	1.26	3.72	1.47	2.64	4.72	8.49	71.02
Nadarivatu	18	24.69	23.47	23.60	8.49	6.71	3.07	2.94	5.93	3.68	4.91	8.58	16.36	132.43
Lautoka	18	9.06	12.49	10.63	4.31	4.57	2.14	1.99	3.32	1.80	2.96	3.79	7.89	64.95
Nadroga	12	8.55	8.41	8.96	5.43	6.56	3.78	2.47	5.47	2.10	3.90	5.44	8.53	69.60
Navua	34	14.81	12.07	16.28	15.07	13.69	8.34	5.83	10.08	8.82	11.02	12.41	14.77	143.19
Suva	34	10.72	10.13	14.70	11.28	10.16	6.15	4.60	8.24	6.98	7.80	9.51	12.11	112.38
Kandavu	12	8.18	9.02	7.64	5.88	7.31	3.20	3.41	6.70	3.75	4.86	3.76	5.23	68.94
Rotumah I.	14	14.57	17.18	12.88	11.78	10.52	8.64	7.08	7.93	10.09	9.62	10.77	12.09	133.15
Maximum precipitation in 24 hours (in inches)														
Delanasua	10	12.08	5.56	14.95	4.70	3.51	3.90	3.50	2.67	3.59	2.80	5.52	2.90	14.95
Levuka	8	4.94	4.67	4.56	6.97	4.65	5.29	3.92	6.92	2.99	7.92	4.38	5.80	7.92
Suva	16	4.32	7.42	9.55	6.86	7.40	5.26	5.95	6.30	5.23	8.36	15.91	10.04	15.91
Mean number of days with precipitation														
Delanasua	40	20	19	20	16	11	7	6	8	9	10	12	14	152
Levuka	13	19	19	21	19	17	14	13	14	14	13	15	17	196
Lautoka	7	13	14	13	8	6	2	2	5	3	5	8	8	87
Suva	34	23	21	25	23	22	18	17	19	19	19	19	22	247

TABLE 31.—*Suva, Fiji Islands*

	Length of record, years	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Temperature														
Mean maximum	33	85.8	86.5	86.0	84.3	81.8	80.3	79.2	79.2	80.2	81.5	82.8	84.8	82.7
Mean minimum	33	74.0	74.4	74.1	73.0	71.3	69.4	68.0	68.2	68.9	70.5	71.6	73.1	71.4
Mean	33	79.9	80.4	80.0	78.6	76.6	74.8	73.6	73.7	74.6	76.0	77.2	79.0	77.0
Highest	33	95	97	98	94	93	90	90	90	90	93	93	96	98
Lowest	33	67	67	66	61	61	58	58	57	57	62	62	62	57
Relative humidity														
Mean, 9a	33	77	79	80	80	81	80	79	79	77	75	75	76	78
Cloudiness														
Mean, 9a	8	6.0	5.4	5.6	5.6	6.2	5.6	5.5	6.6	6.8	5.0	6.1	6.1	5.9
Wind														
Prevailing direction	13	se.	ne.	se.	se.	se.	se.	se.	se.	se.	se.	se.	se.	se.
Mean velocity, m. p. h.	26	4.3	4.1	3.7	4.0	4.3	5.1	6.6	5.2	6.2	6.0	5.6	5.7	5.1
Days with thunderstorm														
Mean number	14	6	6	7	4	2	2	1	1	1	1	2	5	38

Coordinates: 18° 8′ S., 178° 22′ E.; elevation, 44 feet.

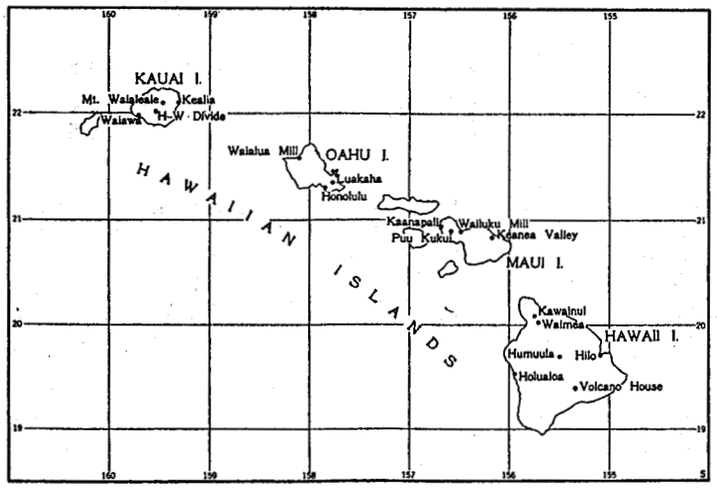
POLYNESIA

Polynesia, "many islands," is generally taken to include all of the tropical Pacific islands lying between 180° and 120° west longitude, the Hawaiian Islands not excepted. Land of volcanic origin is found in all of the region, the separate areas ranging in size from the large island of Hawaii to islets such as Mangareva (5 miles in length) in the Low Archipelago. Coral formation also exists in all of the region, appearing as island, atoll, fringing or barrier reef.

Meteorological data are available for nearly all of the subdivisions of Polynesia as follows: Hawaiian Islands, Central Polynesian Sporades (including the America Islands), Ellice, Marquesas, Samoan, Tonga, Cook, and Society Islands, and Taumotu, or the Low Archipelago.

HAWAIIAN ISLANDS

The main islands, Hawaii, Maui, Oahu, and Kauai, lie near latitude 20° north, between 155° and 160° west longitude. A chain of minor islands extending to the north-



west includes Midway Island in the Temperate Zone 1,500 miles from the main group.

The Summary of the Climatological Data for the United States, Hawaii Section (1918), gives detailed information as to climatic conditions. Some data from this publication are presented here to give a general view of the climate in different parts of the larger islands. The table for Midway Island (28° 13′ N., 177° 22′ W., elevation 19 feet) is compiled from United States Weather Bureau records for the period 1917–1925.

Temperature conditions near sea level for leeward and windward coasts are shown by the means for Honolulu, Oahu (21° 18′ N., 157° 52′ W., elevation 111 feet), and Hilo, Hawaii (19° 44′ N., 155° 3′ W., elevation 40 feet). Change in temperature with increase in elevation up to nearly 7,000 feet is given by the means for the following stations on the island of Hawaii: Hilo, 40 feet; Holualoa, 1,450 feet; Waimea, 2,700 feet; Volcano House, 4,000 feet; and Humuula, 6,685 feet.

TABLE 32.—*Temperature data, Hawaii Island*

Stations	Length of record, years	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Mean maximum temperature														
Hilo	14	77.4	77.2	77.0	77.6	79.6	80.1	80.9	82.2	82.1	81.5	79.9	78.4	79.5
Holualoa	12	75.6	75.5	74.8	75.5	76.0	76.1	77.3	78.8	78.7	78.6	78.0	76.5	76.8
Waimea	11	66.9	68.7	69.2	69.0	70.3	69.7	70.1	71.8	72.4	71.7	69.7	67.6	69.8
Volcano House	10	66.4	66.2	66.6	67.2	69.2	69.9	70.7	71.0	71.2	69.9	69.2	68.3	68.6
Humuula	7	60.7	60.3	59.3	59.5	61.0	63.0	64.8	65.1	64.2	64.1	61.8	61.1	62.1
Mean minimum temperature														
Hilo	14	62.1	61.6	62.6	63.7	64.8	65.9	66.8	67.5	66.7	66.4	65.2	63.3	64.7
Holualoa	12	59.1	57.8	58.8	59.0	61.0	62.2	61.5	62.9	63.0	62.2	60.8	59.0	60.6
Waimea	11	52.6	53.3	54.0	54.3	55.8	56.2	56.3	58.0	58.2	56.7	55.6	53.5	55.4
Volcano House	10	48.2	48.3	48.8	49.7	50.9	51.9	52.5	53.8	53.0	52.2	52.3	50.5	51.0
Humuula	7	38.8	39.9	37.7	38.8	42.1	42.7	44.4	45.8	45.9	44.8	42.2	41.6	42.0
Mean temperature														
Hilo	14	69.7	69.2	69.8	70.6	72.2	73.0	73.9	74.8	74.4	74.0	72.6	70.8	72.1
Holualoa	12	67.3	66.6	66.8	67.0	68.5	69.2	69.4	70.9	70.9	70.4	69.4	67.8	68.7
Waimea	11	61.1	60.6	61.2	61.8	63.1	63.2	64.0	64.9	65.3	64.9	63.3	61.2	62.9
Volcano House	10	57.8	57.8	58.3	59.1	60.6	61.5	62.1	62.4	62.7	61.5	60.7	59.4	60.6
Humuula	7	49.8	50.3	48.5	49.0	51.6	52.9	54.6	55.5	54.5	54.4	52.0	51.3	52.0
Highest temperature														
Hilo	14	88	86	88	89	89	89	90	91	89	88	90	89	91
Holualoa	12	84	86	82	80	84	82	85	84	84	84	84	81	86
Waimea	11	78	77	80	78	80	83	80	81	82	82	82	78	83
Volcano House	10	83	77	80	78	79	79	80	81	84	79	78	79	84
Humuula	7	84	72	69	68	74	72	76	75	75	76	71	84	84
Lowest temperature														
Hilo	14	54	53	56	59	51	60	61	60	60	60	59	53	51
Holualoa	12	50	49	51	52	54	55	57	59	59	56	54	50	49
Waimea	11	34	42	42	40	45	41	48	50	50	44	40	40	34
Volcano House	10	40	40	41	44	47	46	45	44	46	43	40	40	40
Humuula	7	28	29	25	29	30	31	35	34	37	33	31	28	25

TABLE 33.—*Precipitation data, Hawaiian Islands*

Stations	Elevation, feet	Length of record, years	January	February	March	April	May	June	July	August	September	October	November	December	Annual
	Mean precipitation (in inches)														
Hawaii															
Hilo	40	31	9.93	11.47	15.14	13.44	10.08	8.11	10.77	12.32	10.81	11.05	14.64	11.67	139.43
Holualoa	1,450	17	3.72	3.24	4.79	4.56	5.85	6.19	7.58	7.23	7.52	5.33	3.43	3.59	63.03
Humuula	6,685	8	2.43	2.89	2.39	2.12	1.85	1.00	1.79	4.73	2.08	2.59	4.22	4.19	32.28
Kawainui	4,080	12	18.17	19.58	19.70	24.33	24.90	28.67	30.30	27.60	20.02	17.97	23.95	21.42	276.61
Volcano House	4,000	17	6.62	7.22	8.41	7.53	5.58	3.88	5.87	7.63	5.82	6.58	11.36	7.07	83.57
Waimea	2,700	28	4.76	4.64	4.98	3.66	3.14	2.45	2.89	3.25	2.19	2.61	3.52	5.41	43.50
Maui															
Kaanapali	12	20	4.22	3.24	2.26	1.43	0.93	0.36	0.48	1.22	0.50	0.69	1.55	3.24	20.17
Keanea Valley	1,000	14	14.97	17.04	21.22	28.82	21.09	19.87	20.80	25.78	19.61	15.91	22.18	26.27	253.56
Puu Kukui	5,000	7	25.81	22.52	32.61	46.91	26.00	33.51	35.09	29.80	22.20	24.93	38.21	32.48	370.07
Waialuku Mill	175	27	4.14	4.86	3.91	2.15	1.52	0.41	0.62	1.03	0.89	1.42	3.02	3.88	27.85
Oahu															
Honolulu [1]	50	35	3.24	4.52	3.65	2.05	1.66	0.93	0.92	1.24	1.47	1.75	3.80	4.52	29.75
Luakaha	1,111	14	12.32	9.98	15.49	15.59	16.01	11.29	11.06	13.45	13.26	10.18	14.71	16.92	160.26
Waialua Mill	30	18	4.49	5.12	3.94	2.03	1.38	0.94	0.97	1.26	1.56	1.36	3.45	5.26	31.76
Kauai															
Hiloa-Manawaiopuna Divide	2,080	8	19.02	10.70	16.92	20.15	17.79	18.78	22.51	19.08	20.71	19.14	27.08	25.17	237.05
Kealia	14	19	4.00	3.96	6.81	2.50	2.43	1.92	2.00	1.97	3.02	3.16	3.98	5.06	40.81
Mount Waialeale	5,075	5													476.00
Waiawa	35	23	3.08	3.16	4.07	1.03	1.05	0.44	0.47	0.38	1.36	1.37	2.69	3.11	22.21
	Maximum precipitation in 24 hours (in inches) [2]														
Hawaii															
Hilo	40	16	5.50	7.00	8.18	14.50	5.60	7.40	5.12	7.30	13.65	6.78	7.50	5.00	14.50
Maui															
Keanea Valley	1,000	16	6.75	11.63	21.88	15.95	11.20	5.60	7.93	10.85	7.28	6.78	7.87	17.21	21.88
Waialuku Mill	175	16	5.64	3.32	3.34	4.19	2.36	0.90	0.73	1.55	1.53	1.32	3.65	6.22	6.22
Oahu															
Honolulu [3]	50	16	4.48	3.46	13.52	3.79	1.94	3.00	1.19	1.12	2.70	4.58	4.31	4.83	13.52
Luakaha	1,111	16	6.58	10.15	10.74	8.56	6.32	4.55	4.87	5.98	7.57	4.35	5.26	6.60	10.74
Kauai															
Kealia	14	16	5.85	3.00	4.50	1.95	2.65	1.95	1.81	1.45	8.30	8.00	8.70	4.20	8.30
	Mean number of days with precipitation														
Hawaii															
Hilo	40	14	18	16	23	26	24	24	27	24	25	24	24	24	279
Holualoa	1,450	13	8	6	12	13	18	19	17	17	18	15	10	8	161
Humuula	6,685	8	12	9	15	19	18	14	15	14	15	15	14	13	173
Volcano House	4,000	5	25	20	26	29	29	26	26	24	26	27	26	28	312
Waimea	2,700	14	15	15	16	20	22	22	24	22	19	18	19	19	231
Maui															
Kaanapali	12	13	8	6	6	6	4	2	2	3	4	3	5	8	57
Keanea Valley	1,000	14	20	18	23	26	27	27	29	28	24	25	24	25	296
Waialuku Mill	175	14	9	9	7	8	6	4	4	5	5	6	8	8	79
Oahu															
Honolulu [3]	50	14	14	11	13	13	12	13	13	13	13	14	14	16	159
Luakaha	1,111	14	17	15	19	22	24	24	23	23	24	22	23	22	258
Waialua Mill	30	14	13	10	13	11	11	10	10	11	11	12	15	15	142
Kauai															
Kealia	14	14	10	7	12	7	8	9	10	10	10	10	9	10	112
Waiawa	35	14	7	5	5	2	2	2	2	2	3	4	3	4	41

[1] Kinau Street.
[2] Compiled from monthly reports of the Hawaiian section, U. S. Weather Bureau
[3] U. S. Weather Bureau.

TABLE 34.—*Honolulu, Oahu Island*

	Length of record, years	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Temperature														
Mean maximum	14	75.5	75.9	76.2	77.6	79.6	81.0	82.2	83.0	83.0	81.7	79.4	77.3	79.4
Mean minimum	14	65.5	65.6	66.0	67.7	69.6	71.4	72.4	73.2	73.0	71.8	69.7	67.8	69.5
Mean	14	70.5	70.7	71.1	72.7	74.6	76.2	77.3	78.1	78.0	76.8	74.6	72.6	74.4
Highest	14	82	84	82	82	85	86	87	87	87	87	85	83	87
Lowest	14	57	56	57	60	63	66	67	66	68	63	61	59	56
Relative humidity														
Mean, 8a	14	70	70	69	66	66	65	65	66	66	67	69	70	68
Mean, 8p	14	73	73	71	71	71	71	70	70	70	71	72	73	71
Mean, bihourly	5	71	69	67	67	67	66	65	66	65	68	68	71	68
Mean, 2p	5	64	59	58	58	59	57	57	57	57	60	59	63	59
Cloudiness														
Mean [1]	10	4.4	4.9	4.7	5.0	4.6	4.1	4.0	4.6	4.0	4.6	4.9	4.5	4.5
Sunshine														
Mean percentage of possible	14	58	64	58	61	67	66	66	68	66	67	60	58	64
Wind														
Prevailing direction	14	ne.	ne.	ne.	ne.	ne.	ne.	ne.	ne.	ne.	ne.	ne.	ne.	ne.
Mean velocity (miles per hour)	14	8.6	8.0	8.5	9.2	8.3	8.5	8.5	8.5	7.7	7.3	8.5	8.5	8.4
Maximum velocity [1]	16	54	48	50	40	33	30	31	36	32	31	39	55	55
Direction at maximum [1]		s.	sw.	nw.	ne.	ne.	e.	ne.	ne.	ne.	sw.	s.	se.	se.
Days with thunderstorm														
Mean number [1]	16	1.2	0.6	0.7	0.2	0.4	0.1	0.0	0.1	0.1	0.2	0.3	0.9	4.8

[1] Compiled from monthly reports of the Hawaiian section of the Climatological Service of the United States Weather Bureau, 1905–1920.

TABLE 35.—*Midway Island*

	Length of record, years	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Temperature														
Mean maximum	9	72.0	71.0	72.4	74.0	78.3	82.2	84.1	85.2	84.7	80.9	76.9	72.3	77.8
Mean minimum	9	60.1	58.7	60.7	61.4	64.0	68.5	71.2	71.8	71.4	68.1	64.8	61.4	65.2
Mean	9	66.0	64.8	66.6	67.7	71.2	75.4	77.6	78.5	78.0	74.5	70.8	66.8	71.5
Highest	9	79	80	81	82	87	89	90	91	90	89	84	80	91
Lowest	9	46	48	50	50	53	56	66	64	59	56	53	51	46
Precipitation														
Mean	9	4.19	3.66	4.24	5.08	3.60	3.35	3.08	3.54	5.01	5.20	1.74	3.61	46.30
Maximum in 24 hours	9	3.38	1.73	3.75	5.55	6.10	3.98	4.07	3.12	5.85	6.33	1.43	2.05	6.10
Days with precipitation	9	16	16	13	11	10	10	15	14	15	12	12	18	162
Wind														
Prevailing direction	7	sw.	sw.	e.	ne.	ne.	ne.	ne.	ne.	ne.	ne.	ne.	nw.	ne.
Mean velocity (miles per hour)	6	14.9	17.3	15.5	15.3	11.8	10.8	13.1	11.0	12.1	13.5	14.6	18.3	14.0
Maximum velocity	6	46	60	53	60	38	49	46	36	43	53	60	[1] 77	[1] 77
Direction at maximum velocity	6	ne.	w.	sw.	e.	sw.	s.	s.	----	----	sw.	nw.	nw.	nw.
Days with thunderstorm														
Mean number	5	1.0	0.0	0.0	0.5	0.4	0.2	0.2	1.0	0.2	1.4	0.0	0.2	5.1

[1] Dec. 23, 1920; the next highest velocity was 72 miles per hour from the northwest on Dec. 21, 1925.

CENTRAL POLYNESIAN SPORADES

The few widely scattered islands of this group lie south of the Hawaiian Islands on either side of the Equator. The northern islands, among which are Fanning and Christmas Islands are also known as the America Islands.

Data are available for Fanning Island (3° 55′ N., 159° 23′ W.), Christmas Island (1° 57′ N., 157° 28′ W.), and Malden Island (3° 59′ S., 155° 0′ W.).

The mean annual temperature from the longer records on Fanning and Malden is about 82°, with a difference of about 1.5° between the means for the warmest and coolest months. Maximum temperatures are much higher on Christmas Island than on the other islands—100° or above being recorded in each month of the year.

There is a very large difference in the amount of rain received annually on the northern and southern islands—118 and 26 inches, respectively. The characteristic feature of rainfall in this region is the extreme variation in the amounts received annually; the values in Table 37 are chosen to represent this.

TABLE 36.—*Temperature and precipitation data, Central Polynesian Sporades*

Station	Length of record, years	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Mean maximum temperature														
Fanning I.	10	86.5	86.3	86.7	86.5	87.0	87.6	87.9	88.5	88.5	88.9	89.9	87.5	87.6
Malden I.	7	89.2	89.6	89.8	89.6	90.0	90.7	90.3	90.1	90.3	90.0	90.0	89.4	89.9
Mean minimum temperature														
Fanning I.	10	77.0	77.0	77.0	77.1	77.0	77.0	76.9	77.0	76.4	76.8	77.4	76.7	76.9
Malden I.	7	73.8	73.8	74.3	74.5	74.8	75.6	75.4	75.2	74.5	73.8	73.4	73.8	74.4
Mean temperature														
Fanning I.	10	81.8	81.6	81.8	81.8	82.0	82.3	82.4	82.8	82.4	82.8	83.6	82.1	82.3
Malden I.	7	81.5	81.7	82.0	82.0	82.4	83.2	82.8	82.6	82.4	81.9	81.7	81.6	82.2
Highest temperature														
Fanning I.	8	95	94	95	94	96	96	96	98	100	99	100	97	100
Christmas I.	2	102	102	104	106	104	106	104	104	106	100	102	100	106
Malden I.	7	95	94	97	95	95	96	95	95	94	93	95	95	97
Lowest temperature														
Fanning I.	8	71	71	72	72	71	71	70	72	69	71	70	69	69
Christmas I.	2	72	73	72	73	73	75	75	75	75	72	73	73	72
Malden I.	7	65	69	70	70	69	70	70	71	70	70	67	70	65
Mean precipitation (in inches)														
Fanning I.	13	10.77	9.72	12.54	17.04	13.99	11.49	11.24	5.71	3.99	4.98	3.76	12.99	118.22
Christmas I [1]	3	6.93	5.35	5.00	4.65	5.55	1.85	2.68	1.18	1.06	0.55	0.32	2.24	37.36
Malden I.	27	3.33	1.52	4.34	4.12	3.88	1.79	1.93	1.59	0.80	1.00	0.77	0.83	25.90
Mean number of days with precipitation														
Fanning I.	5	14	12	11	15	13	13	15	10	7	8	7	16	141
Christmas I [1]	3	27	23	25	29	18	(2)	(2)	(2)	(2)	(2)	(2)	29	151
Malden I.	17	----	----	----	----	----	----	----	----	----	----	----	----	73
Prevailing wind direction														
Fanning I.	5	se.	e.	se.	e.	e.	se.	se.	se.	se.	se.	se.	se.	se.
Christmas I.	2	e.	ne.	e.	e.	e.	e.	e.	e.	e.	e.		e.	e.

[1] For the period June, 1916, to September, 1919. In marked contrast to this annual mean (37.36 inches) are the totals: 1903, 74.41 inches; 1904, 45.77 inches; and January-October, 1905, 298.11 inches. Monthly values are not available for the last series.
[2] Included in the December value.

References to source of data: Fanning Island, Meteorologische Zeitschrift, 1913, p. 395; Réseau Mondial, 1910–1918; Christmas Island, Meteorological Office Circular No. 44, Air Ministry, Great Britain; Results of Rainfall Observations made in Queensland, Appendix I, Commonwealth Bureau of Meteorology, 1914; Malden Island; Results of Rainfall Observations made in Queensland, Appendix I; Réseau Mondial, 1910–1918

TABLE 37.—*Annual precipitation (in inches), Fanning and Malden Islands*

Year	Fanning Island	Malden Island
1905	208.77	63.34
1908	----	3.94
1910	57.46	12.63
1914	165.23	93.59
1915	144.93	71.92
1917	47.41	16.50

ELLICE ISLANDS

The Ellice Islands, the most western of the Polynesian groups, lie just to the southeast of the Gilbert Islands, which they closely resemble in formation, being low coralline islets and atolls.

On the northern islands the mean annual precipitation is about the same as for the Gilbert Islands, 80 to 100 inches, while on the southern islands there is an increase to 120–130 inches. The season of heaviest rainfall begins in November and ends in March.

The data in Table 38 are compiled from records furnished by the United States Hydrographic Office.

TABLE 38.—*Mean monthly and annual precipitation, Ellice Islands, 1922–1925*

Stations	Length of record, years	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Nanumea I.	4	12.14	5.50	12.51	4.22	7.38	4.56	8.83	3.74	1.82	4.00	8.70	8.39	81.79
Niutao I.	4	13.80	7.44	13.29	6.72	7.16	6.65	11.43	3.36	3.88	4.71	9.87	9.12	97.43
Fanafuti I.	4	14.04	10.02	17.26	9.28	9.21	8.11	8.72	7.44	7.82	7.04	9.50	18.84	127.28
Nukulaelae I.	4	10.86	8.00	20.29	7.93	4.36	10.42	7.08	7.10	7.26	7.96	9.95	18.93	120.14

MARQUESAS ISLANDS

The only records for this region are those given in the Meteorologische Zeitschrift, 1923, page 145, for the following stations on the islands of Nukuhiva and Fatuiva respectively: Taiohae (9° 0′ S., 140° 0′ W.) and Oomoa 10° 30′ S., 138° 30′ W.).

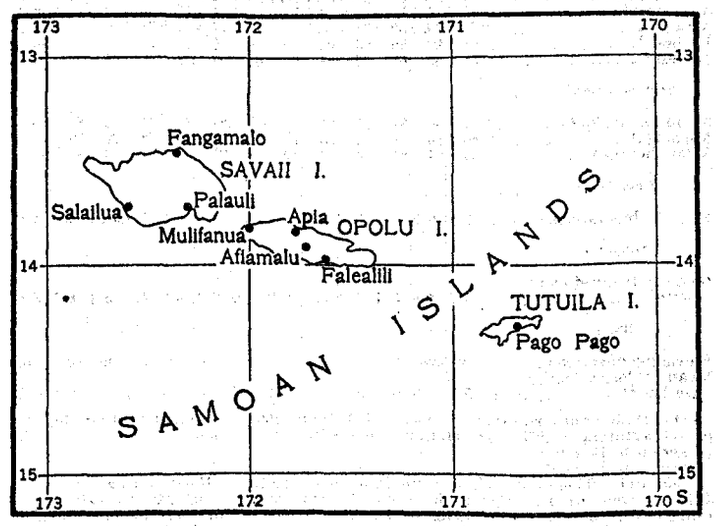
TABLE 39.—*Mean monthly and annual precipitation, Marquesas Islands*

Stations	Length of record, years	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Nukuhiva I.														
Taiohae	2-4	9.08	2.42	3.78	6.03	6.22	1.87	4.78	5.20	5.32	6.08	5.08	5.28	61.14
Fatuiva I.														
Oomoa	2	5.12	7.68	5.90	7.08	9.74	5.57	7.66	6.36	13.52	5.22	6.08	14.54	94.47

SAMOAN ISLANDS

This group, lying near latitude 14° S. and between longitudes 171° and 173° W., about 500 miles northeast of the Fiji Islands, includes three rather large and important islands—Savaii, Opolu, and Tutuila. These volcanic islands, surrounded in part by coral reefs, are considerably elevated; the highest of the extinct craters, Mau on Savaii, rises 4,000 feet above sea level.

Meteorological observations at Apia (13° 48′ S., 171° 46′ W., elevation 16 feet) on the northern coast of Opolu extend over a long period of years. The early records are given in Deutsche überseeische meteorologische Beobachtungen, Deutsche Seewarte, Hamburg; recent records in current publications of the Apia Observatory. The greater part of the data presented here is taken from the following papers: Das Klima von Samoa by Tetens and Linke, published in Abhandlungen der Königlichen Gesellschaft der Wissenschaften zu Göttingen, Mathematisch-Physikalische Klasse, New Series, volume 7, No. 4, 1910, and A Summary of the Meteorological Observations of the Samoa Observatory (1890–1920), by G. Angenheister.



The mean annual temperature near sea level is 79°, with but little difference between the means of the warmest and coolest months—80° in March and 77° in July. The temperature extremes for the several months are about 90° to 95° for the maximum and 60° to 70° for the minimum. Afiamalu, at an elevation of 1,970 feet, has the following temperature means: Annual, 73°; February, 75°; August, 71.°

As in other islands of the Pacific with similar topography, the amount of precipitation varies considerably with change in exposure and difference in elevation. On Opolu the mean annual rainfall is about 180 inches for the stations of Falealili on the southern coast and Afiamalu in the elevated interior, about 115 inches in the vicinity of Apia on the northern coast, and 100 inches or less in the western part of the island. The average precipitation at the coast stations of Savaii is about 150 inches and that in the interior probably greater than the the amount given for Afiamalu. Pago Pago, on Tutuila Island, has a mean annual precipitation of nearly 200 inches.

On the northern coasts and in the interior the precipitation from May to October, inclusive, is much less than that for the remaining six months. At Apia these seasonal averages are, respectively, 30 inches and 82 inches; at Afiamalu, 50 inches and 131 inches. On or near the southern coasts the amounts for the abovementioned seasons are about the same. Except in the regions where rainfall is rather evenly distributed there is marked difference between the maximum in January or February and the minimum in July or August; at Afiamalu this difference is more than 22 inches.

TABLE 40.—*Apia, Samoan Islands* [1]

	Length of record, years	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Temperature														
Mean maximum [2]	20	84.4	85.3	85.6	84.9	84.7	83.7	83.1	82.9	83.3	84.0	84.2	84.6	84.2
Mean minimum [2]	20	74.7	74.5	74.3	73.9	72.7	71.6	71.4	71.8	72.5	73.4	73.8	74.5	73.3
Mean [2]	20	79.6	79.9	80.0	79.4	78.7	77.6	77.2	77.4	77.9	78.7	79.0	79.6	78.8
Highest [3]	29	91	92	96	93	92	90	89	90	92	91	93	91	96
Lowest [3]	29	68	69	68	65	64	63	63	63	61	66	64	68	61
Relative humidity														
Mean 7a, 2p., 9p. [2]	20	87	87	86	87	85	84	83	82	83	84	86	86	85
Mean 2p. [2]	20	80	80	78	79	76	76	75	75	77	78	79	79	78
Mean, hourly [4]	5	84	84	81	86	83	82	83	81	82	82	83	82	83
Cloudiness														
Mean 3 observations [2]	20	7.1	6.3	6.1	5.7	4.7	4.9	4.5	4.2	5.2	5.4	6.1	6.7	5.6
Sunshine														
Mean daily duration in hours [5]	6	4.7	4.8	5.4	5.3	5.7	5.2	6.0	6.4	5.9	5.9	5.4	4.7	5.4
Wind														
Prevailing direction [4]	5	ssw.	sw.	sse.	se.	e.	e.	e.	e.	e.	ene.	ene.	ese.	e.
Mean velocity miles per hour [6]	11	5.8	5.6	5.8	5.2	6.6	7.4	6.7	8.0	7.8	7.4	5.4	4.4	6.3

[1] Observations at Sogi for the periods 1890–1907 and 1909–1910 and at Mulinuu for the period beginning in 1903. The stations are less than 2 miles apart.
[2] 1890–1907, 1909–1910.
[3] 1890–1907, 1909–1919.
[4] 1902–1906. These data relate to the immediate location. Relative to general conditions, Ergebnisse der Arbeiten des Samoa-Observatoriums, 1902–1906, by Tetens and Linke (1908,) contains the following statement: "Samoa lies in the region of the southeast trade. From ship observations W. Köppen has shown that in the southern winter the trade occurs regularly as a southeast wind, while in the summer it has a direction almost east-northeast. At this period the trade blows lightly and is often interrupted by other winds, for the greater part those from the west."
[5] 1905–1906, 1916–1919.
[6] 1906, 1908, 1911–1919.
[7] 1891–1907.

TABLE 40.—*Apia, Samoan Islands*—Continued

	Length of record (years)	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Days with thunderstorm														
Mean number [7]	17	3.5	2.7	3.1	2.6	1.6	1.2	0.4	0.3	0.8	2.3	2.8	3.7	25.0

TABLE 41.—*Afiamalu, Samoan Islands, 1905–1907*

	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Temperature													
Mean maximum	81.7	82.6	81.3	80.6	81.3	79.7	79.9	79.5	81.3	82.9	81.9	82.9	81.3
Mean minimum	66.7	66.7	66.0	66.2	64.6	62.6	63.7	62.4	63.3	64.6	64.6	65.5	64.7
Mean	74.2	74.6	73.6	73.4	73.0	71.2	71.8	71.0	72.3	73.8	73.2	74.2	73.0
Relative humidity													
Mean, 6–7a	95	95	96	95	93	93	94	94	92	91	93	93	94
Mean, 1–2p	87	85	87	87	83	82	83	81	82	82	85	85	84
Mean, 8–9p	95	95	96	95	94	93	93	94	93	93	94	96	94

TABLE 42.—*Precipitation data, Samoan Islands*

Stations	Length of record, years	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Savaii Island		Mean precipitation (in inches)												
Fangamalo	6	23.42	15.84	14.49	17.13	8.41	7.48	4.40	5.92	8.46	8.94	16.00	13.12	143.61
Palauli	4	13.81	15.76	14.40	14.09	11.06	7.39	11.93	11.63	11.97	11.33	17.75	12.52	153.64
Salailua	6	15.67	12.04	15.38	9.72	13.02	7.77	10.85	13.12	13.00	11.81	14.41	11.80	148.59
Opolu Island														
Aflamalu	5	25.13	27.95	18.18	20.85	9.28	8.99	5.69	7.36	8.98	9.50	20.06	18.57	180.54
Apia (Sogi)	21	18.90	16.65	14.96	11.26	5.63	5.75	2.60	3.78	5.83	7.05	11.26	14.80	118.47
Apia (Mulinuu)	17	16.50	15.94	13.15	10.94	5.94	5.55	2.80	3.07	5.16	5.79	9.13	13.82	107.79
Falealili	4	15.44	11.50	18.92	14.65	14.19	12.80	14.10	10.61	19.53	20.74	21.53	11.75	185.76
Mulifanua	14	13.59	11.58	11.72	6.91	4.21	4.62	2.93	2.88	4.52	6.17	9.54	11.05	89.72
Tutuila Island														
Pago Pago	22	21.92	23.50	19.06	17.67	15.27	14.38	9.90	7.66	12.87	15.76	19.33	18.93	196.25
Opolu Island		Maximum precipitation in 24 hours (in inches)												
Apia (Sogi)	20	3.37	5.21	3.74	3.39	4.48	2.95	1.74	8.07	8.61	4.30	3.83	5.51	8.07
Apia (Mulinuu)	9	6.57	5.71	5.59	9.57	4.80	4.76	2.09	1.89	2.68	3.35	3.27	10.24	10.24
Tutuila Island														
Pago Pago	21	10.20	13.50	7.80	8.60	20.00	16.50	10.60	16.00	15.90	7.50	16.50	13.00	20.00
Savaii Island		Mean number of days with precipitation												
Fangamalo	6	22	19	21	21	17	14	12	11	15	19	18	20	209
Palauli	4	16	15	16	20	16	13	14	15	16	17	17	16	191
Salailua	6	18	18	18	17	14	12	13	13	15	15	18	19	190
Opolu Island														
Aflamalu	5	30	27	29	25	25	20	18	18	21	23	23	25	284
Apia (Sogi)	20	25	21	23	20	15	14	12	13	15	17	20	22	217
Apia (Mulinuu)	17	21	19	19	18	13	11	11	11	12	15	18	20	188
Falealili	4	14	17	16	18	16	13	12	12	14	16	14	14	176
Mulifanua	13	16	14	14	12	9	8	7	7	8	12	13	13	135

TONGA ISLANDS

The small islands of this group, known also as the Friendly Islands, lie south of the Samoan and southeast of the Fiji Islands. Some of these are of volcanic origin, others of coral formation. There are no considerable elevations.

Short records of rainfall for stations on the islands of Vavua and Tongatuba are the only meteorological data available for this region. Temperature conditions in these islands are probably almost identical with those at Alofi on Niue Island (19° 2′ S., 169° 55′ W. (elevation 120 feet), situated about 250 miles east of Vavua.

The temperature table for Alofi is compiled from data published in the Réseau Mondial, 1910–1918.

TABLE 43.—*Alofi, Niue Island*

	Length of record, years	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Temperature														
Mean maximum	8	88.2	88.5	88.2	86.4	83.5	81.7	81.1	81.7	82.9	84.2	86.2	87.3	85.0
Mean minimum	8	71.2	71.4	72.9	71.1	68.9	66.0	65.8	64.8	65.3	66.7	67.6	70.3	68.5
Mean	8	79.7	80.0	80.6	78.8	76.2	73.8	73.4	73.2	74.1	75.4	76.9	78.8	76.7
Highest	8	97	96	96	93	91	88	93	90	92	95	96	95	97
Lowest	8	65	65	65	61	59	59	54	55	57	58	58	57	54

TABLE 44.—*Precipitation data. Tonga Islands*

	Length of record, years	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Vavua I				Mean precipitation (in inches)[1]										
Neafu	10	10.74	8.36	10.06	8.97	6.34	4.70	3.02	2.80	4.85	5.13	6.83	9.45	81.25
Vaimalo	4	12.73	8.08	8.92	6.86	5.85	3.85	2.80	3.93	5.74	4.70	9.03	5.57	78.06
Tongatuba I														
Nukalofa	4	11.09	14.78	10.82	10.32	8.29	8.18	2.18	3.52	5.96	5.63	3.54	4.24	88.55
Niue I														
Alofi	12	10.28	10.86	11.68	7.55	5.11	3.45	2.36	4.55	5.08	3.70	5.26	9.78	79.66
Vavua I				Mean number of days with precipitation[1]										
Neafu	7	16	17	17	16	13	11	9	8	10	11	11	15	154
Tongatuba I														
Nukalofa	4	10	11	8	11	9	9	3	6	8	5	7	10	97
Niue I														
Alofi	11	17	16	21	15	12	9	8	9	11	9	9	13	149

[1] Compiled from the following sources: Meteorologische Zeitschrift, 1891, p. 141 and 1913, p. 395; Meteorologische Beobachtungen in der Südsee, Nachrichten der Königlichen Gesellschaft der Wissenschaften zu Göttingen, mathem-physik. Klasse, 1911; Results of Rainfall Observations made in Queensland, Commonwealth Bureau of Meteorology, 1914; and Réseau Mondial, 1913–1918.

COOK ISLANDS

This group is situated near 160° west longitude, just north of the Tropic of Capricorn, about 1,000 miles east of the Tonga Islands. The description of the latter holds very well here, but Rarotanga, the principal island, is very hilly, with a volcano rising to the elevation of 2,700 feet.

At Avarua, Rarotanga (21° 12′ S., 159° 47′ W., elevation 20 feet), temperature means are as follows: Annual, 74°; January–March, 78°; July–August, 70°. The extreme temperatures recorded are 92° and 51°. The mean amount of rainfall received annually is about the same in all parts of the region—80 to 85 inches; in January–March monthly totals average about 11 inches, in June–August about 4 inches.

TABLE 45.—*Avarua, Rarotanga, Cook Islands*

	Length of record, years	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Temperature														
Mean maximum	14	83.1	83.3	83.1	81.3	78.8	76.6	75.9	75.2	76.6	77.9	79.7	81.5	79.4
Mean minimum	14	73.0	73.6	73.0	71.1	68.0	65.8	64.6	64.8	65.7	67.3	69.1	71.8	69.0
Mean	14	78.0	78.4	78.0	76.2	73.4	71.2	70.2	70.0	71.2	72.6	74.4	76.6	74.2
Highest	17	92	89	88	87	86	82	82	84	86	85	87	91	92
Lowest	17	64	64	64	61	56	51	52	52	52	56	58	58	51
Relative humidity														
Mean, 7a., 2p., 9p	2	86	86	83	82	84	82	80	78	84	76	82	86	84
Mean, 2p	2	78	78	72	74	76	72	68	70	77	68	74	81	76

Compiled from data published in Deutsche überseeische meteorologische Beobachtungen, Deutsche Seewarte, 1900–1909, and later data in the Réseau Mondial.

TABLE 46.—*Precipitation data, Cook Islands*

	Length of record, years	January	February	March	April	May	June	July	August	September	October	November	December	Annual
				Mean precipitation (in inches)[1]										
Aitutaki I	6	10.46	12.76	11.62	8.60	6.26	4.84	2.37	3.49	4.67	3.64	7.36	9.52	85.59
Mangaia I	6	10.28	12.77	12.24	5.96	5.62	3.94	4.39	3.38	5.94	5.60	8.02	7.07	85.21
Rarotanga I	20	9.80	10.85	11.80	8.25	6.43	4.13	3.66	4.55	4.54	4.75	6.49	7.47	82.72
				Mean number of days with precipitation										
Rarotanga I	16	19	19	21	18	16	14	13	15	13	13	15	16	192

[1] Compiled from the following sources: Results of Rainfall Observations made in Queensland, Appendix I, Commonwealth Bureau of Meteorology, 1914; New Zealand Gazette; Réseau Mondial.

SOCIETY ISLANDS

Rugged, forested mountains with peaks rising to elevations of 2,000 to 7,300 feet give unsurpassed beauty to some of the islands of this group. They are for the greater part of volcanic origin and are surrounded by coral reef.

The only available information relative to meteorological conditions in this area is that given in the Annales du Bureau Central Météorologique de France for Papeiti (17° 32′ S., 149° 34′ W., elevation 20 feet) on the island of Tahiti.

TABLE 47.—*Papeiti, Society Islands*

	Length of record, years	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Temperature														
Mean maximum	15	88.7	88.9	88.7	88.7	86.9	86.2	85.5	85.5	86.5	87.1	87.8	88.0	87.4
Mean minimum	15	71.6	72.0	72.1	71.6	69.8	68.5	67.1	67.6	69.1	69.8	70.5	71.2	70.1
Mean	15	80.2	80.4	80.4	80.2	78.4	77.4	76.3	76.6	77.8	78.4	79.2	79.6	78.7
Highest	8	92	92	92	93	90	89	89	88	90	90	91	91	93
Lowest	8	67	66	66	66	66	64	61	64	63	63	64	64	61
Relative humidity														
Mean, 8a	9	82	82	84	85	84	85	83	83	81	79	80	81	82
Mean, 4p	9	77	77	78	78	78	79	77	78	76	76	77	78	77
Cloudiness														
Mean, 2 observations	9	6.0	5.6	5.0	4.8	5.4	5.1	4.4	5.0	4.2	4.8	5.1	6.1	5.1
Precipitation														
Mean[1]	35	8.21	7.44	6.94	4.34	3.33	2.72	1.91	1.63	2.29	3.52	5.18	8.01	55.52
Mean number of rainy days	14	16	15	14	10	9	7	6	7	7	8	11	15	125

[1] From means for the periods 1846–1868 and 1879 given by Alexander Supan in Die Verteilung des Niederschlags auf der festen Erdoberfläche, Ergänzungheft, No. 124, zu Petermanns Mittellungen and the records appearing in Annales du Bureau Central Météorologique de France, 1892–1909.

LOW OR TUAMOTU ARCHIPELAGO

The Low Archipelago occupies a very large area to the east and southeast of the Society Islands dotted with atoll formations, among which are scattered a few volcanic islands, the largest of which, Mangareva, has a length of only 4 miles.

Data are available for only two of the islands: Makatea (15° 47′ S., 148° 14′ W. (elevation 154 feet) in the extreme northwest, and Mangareva (23° 15′ S., 134° 45′ W.), in the extreme southeast.

From Makatea to Mangareva the change in mean annual temperature is 4° (80° to 76°). In the warm season the northern station has a mean temperature only slightly higher than that of the southern station; in the cool season, however, there is considerable difference, the July means, for example, being 78° at the former and 71° at the latter station.

The mean annual rainfall at Makatea is about 60 inches; the monthly means range from 9 inches in February to 3 inches in July and October. The short series of observations at Mangareva indicates heavier precipitation in the eastern part of the archipelago.

TABLE 48.—*Makatea, Low Archipelago*

	Length of record, years	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Temperature														
Mean maximum	6	89.1	88.0	88.7	87.3	86.2	84.7	83.7	83.8	84.9	86.5	88.2	88.7	86.6
Mean minimum	6	74.7	73.8	74.5	73.8	72.9	72.3	71.4	71.4	71.4	73.2	73.8	73.9	73.1
Mean	6	81.9	80.9	81.6	80.6	79.6	78.5	77.6	77.6	78.2	79.8	81.0	81.3	79.9
Highest	6	94	94	93	93	91	90	89	89	90	93	95	94	95
Lowest	6	69	68	68	67	64	60	62	62	64	66	66	68	60
Relative humidity														
Mean, 6a., noon, 6p	4	79	81	81	83	79	79	77	78	76	76	77	80	79
Mean, noon	4	70	73	72	75	70	70	68	69	67	66	68	70	70
Cloudiness														
Mean, 3 observations	4	5.0	6.0	5.1	5.7	4.6	4.4	4.3	5.1	4.3	4.8	5.0	5.2	5.0
Precipitation														
Mean	6	6.72	8.84	6.10	7.13	3.57	4.76	3.21	4.29	3.68	3.29	5.06	5.46	62.11
Mean number of rainy days	4	16	18	17	17	14	10	10	16	13	10	17	17	175

Compiled from Annales du Bureau Central Météorologique de France, 1910–1913, and Réseau Mondial 1916–1918.

TABLE 49.—*Mangareva, Low Archipelago*

	Length of record, years	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Temperature														
Mean maximum	2	88.0	88.9	87.4	86.4	81.7	78.8	77.7	78.4	80.2	81.0	83.1	84.7	83.0
Mean minimum	2	72.1	72.3	71.6	70.9	69.8	66.0	64.9	65.8	64.8	68.0	69.4	72.3	69.0
Mean	2	80.0	80.6	79.5	78.6	75.8	72.4	71.3	72.1	72.5	74.5	76.2	78.5	76.0
Highest	2	94	97	93	90	88	82	83	85	86	87	89	90	97
Lowest	2	67	68	63	61	58	56	61	58	56	60	61	68	56
Relative humidity														
Mean, 7a., noon, 8p	2	85	84	85	85	83	85	85	84	84	84	82	84	84
Mean, noon	2	72	72	74	74	74	76	76	76	75	76	73	76	74
Precipitation														
Mean	2	5.21	6.62	7.72	4.24	8.64	7.56	4.78	5.53	9.02	12.12	6.64	9.18	87.26
Mean number of rainy days	2	22	19	20	16	20	22	18	16	14	20	20	22	229

Compiled from Annales du Bureau Central Météorologique de France, 1902–1904.

EASTER ISLAND

As in the case of the Bonin Islands off the coast of Japan, reference will be given to sources of data for Easter Island (27° 10′ S., 109° 26′ W.). Records for two years are published in the Anuario Meteorologico de Chile, 1912, 1913. Annual amounts of precipitation for the years 1901–1906 are given in Instituto Meteorologico y Geofisico de Chile, Publicacion 20.

MONTHLY AND ANNUAL RECORDS OF PRECIPITATION FOR SELECTED STATIONS

Table 50 gives monthly and annual records of precipitation at stations with long series of observations. These data are presented mainly to set forth in detail the marked variability in amount of precipitation in all regions of Oceania. The principal features shown in the footings of the individual tables are summarized in Table 5.

TABLE 50.—*Precipitation—Monthly and annual totals, means, and extremes (in inches)*

MEETH, YAP, CAROLINE ISLANDS

Year	January	February	March	April	May	June	July	August	September	October	November	December	Annual
1900	2.41	1.03	1.01	1.41	2.11	5.92	15.13	18.69	12.32	21.17	16.63	11.70	109.53
1901	9.52	17.09	8.14	5.80	9.39	7.47	12.12	17.94	6.74	25.20	11.05	7.88	138.34
1902	15.21	22.61	13.93	5.32	12.30	9.17	18.40	19.43	15.45	4.02	4.20	3.88	143.92
1903	2.25	1.45	1.42	5.69	6.15	11.21	15.46	11.06	13.57	22.28	18.98	16.21	125.73
1904	8.64	5.08	13.26	12.76	12.41	12.16	4.43	16.92	28.19	10.07	7.28	2.48	133.68
1905	2.56	4.61	2.64	2.52	7.44	17.36	19.53	17.48	13.23	12.52	6.89	9.06	115.84
1906	5.62	9.32	2.89	3.35	13.73	8.48	12.18	11.04	14.69	8.18	11.79	11.90	113.17
1907	5.19	13.29	10.53	0.98	9.22	17.92	10.82	30.54	15.80	4.02	8.25	10.06	136.62
1908	13.47	2.37	9.11	4.29	9.76	12.43	9.93	20.95	12.27	10.46	8.87	------	------
1909	5.75	1.84	------	------	------	------	------	------	------	------	13.17	10.15	------
1910	6.77	5.04	5.91	8.04	34.62	9.27	7.39	8.95	14.95	8.01	10.13	7.59	126.67
1911	1.79	12.44	13.18	6.63	9.53	7.83	45.76	14.07	10.27	11.68	2.96	4.70	140.84
1912	[1]2.59	2.59	1.05	3.12	9.02	5.70	16.45	15.40	12.92	12.60	12.74	6.93	101.11
1913	1.47	3.32	1.89	8.96	4.21	3.44	16.87	17.41	14.50	14.66	1.21	5.09	93.03
1914	2.19	9.05	3.71	2.59	5.28	7.68	10.91	10.62	8.09	5.44	4.39	2.97	72.92
1915	3.15	0.70	2.89	2.79	11.88	15.58	12.09	18.83	5.85	12.80	8.45	14.45	109.46
1916	13.89	17.56	12.00	7.67	13.19	15.80	9.46	9.76	17.66	15.30	13.35	6.38	152.02
1917	8.72	4.22	6.82	2.76	12.25	7.90	13.87	9.02	17.55	8.26	11.72	9.39	112.48
1918	10.33	7.63	4.11	12.69	3.68	8.49	19.56	17.87	8.05	8.70	7.70	5.94	114.75
1919	2.50	2.29	2.44	2.44	7.77	14.43	16.73	19.06	10.44	11.56	10.12	6.84	96.62
1920	9.24	9.50	3.73	2.79	8.56	10.48	31.14	11.83	8.11	10.32	8.89	[1]9.76	124.35
Mean	6.35	7.29	6.03	5.13	10.13	10.15	15.72	15.76	13.02	11.86	9.46	8.17	119.07
Greatest	15.21	22.61	13.93	12.76	34.62	17.92	45.76	30.54	28.19	25.20	18.98	16.21	152.02
Least	1.47	0.70	1.01	0.98	2.11	3.44	4.43	8.95	5.85	4.02	1.21	2.48	72.92

UJELANG ISLAND, MARSHALL ISLANDS

1894	1.34	1.15	1.42	8.89	7.88	3.25	10.29	9.52	8.59	11.72	6.41	5.83	76.29
1895	7.31	3.57	1.74	7.06	10.61	10.04	7.59	10.30	16.34	12.94	5.49	2.97	95.96
1896	3.19	1.10	1.51	3.94	7.81	9.10	12.93	14.08	15.89	11.68	7.98	1.94	91.15
1897	1.20	0.73	5.70	2.90	7.51	0.80	4.51	11.16	7.84	8.27	3.04	3.21	56.87
1898	0.92	0.83	0.80	5.67	9.43	3.24	2.94	3.44	7.10	10.28	10.49	5.23	60.37
1900	1.04	0.46	0.41	0.76	0.89	7.18	3.49	3.72	8.43	6.58	12.15	8.16	53.27
1901	2.68	3.98	1.80	2.68	------	------	------	------	------	------	------	------	------
1902	0.72	2.20	10.59	5.16	7.36	4.02	8.85	10.08	10.58	13.74	8.44	2.72	84.46
1903	0.72	2.05	0.37	4.16	3.94	6.71	18.53	5.47	13.28	9.75	10.78	5.76	81.52
1905	2.02	0.29	(2)	(2)	(2)	3.55	10.04	11.64	10.15	12.02	24.26	5.22	86.53
1906	2.65	0.48	0.49	2.46	6.02	7.20	8.84	7.76	6.08	14.32	4.69	2.28	63.27
1907	4.20	3.65	2.89	9.94	14.30	8.05	5.70	12.50	13.71	8.89	14.01	6.30	104.14
1908	1.65	0.41	2.83	14.21	7.20	7.88	5.28	10.11	8.43	10.16	14.17	7.96	90.29
1909	0.94	0.95	1.36	5.15	5.42	14.44	10.14	4.80	9.79	7.60	9.23	1.98	71.79
1910	3.66	2.07	4.12	4.56	4.54	5.35	7.48	7.91	7.44	13.07	9.88	5.68	75.76
1911	2.03	6.57	7.10	9.65	7.44	23.19	15.29	11.21	15.08	9.14	3.72	3.91	114.33
1912	1.19	0.62	1.02	0.59	0.77	2.48	4.93	4.29	8.18	10.65	8.10	8.50	51.32
1913	0.70	0.87	0.40	1.52	4.89	4.83	5.37	5.91	7.95	5.60	------	------	------
Mean	2.12	1.78	2.62	5.25	6.63	7.14	8.36	8.46	10.29	10.38	9.55	4.85	77.43
Greatest	7.31	6.57	10.59	14.21	14.30	23.19	18.53	14.08	16.34	14.32	24.26	8.50	114.33
Least	0.70	0.29	0.37	0.59	0.77	0.80	2.94	3.44	6.08	5.60	3.04	1.94	51.32

[1] Incomplete.
[2] March–May, 1905, total, 7.34 inches.

TABLE 50.—*Precipitation—Monthly and annual totals, means, and extremes (in inches)*—Continued

NAURU ISLAND, GILBERT ISLANDS

Year	January	February	March	April	May	June	July	August	September	October	November	December	Annual
1893	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.46	0.28	5.09	-----
1894	0.32	0.17	0.46	0.15	0.46	6.72	2.47	4.44	1.79	0.63	1.12	2.67	21.40
1895	10.91	12.55	5.26	0.26	3.72	2.12	0.91	1.86	-----	3.78	8.80	12.06	-----
1896	11.94	7.82	7.06	5.39	7.30	4.02	11.28	8.49	9.97	13.42	6.18	22.42	115.29
1897	6.76	11.75	5.58	2.96	3.34	-----	4.97	0.74	1.34	4.25	6.21	0.83	-----
1898	3.70	-----	0.42	2.27	0.55	0.93	1.75	3.35	0.65	0.77	-----	2.40	-----
1899	0.69	1.02	0.04	0.71	1.97	11.26	7.36	12.09	4.11	5.12	10.55	16.18	71.10
1900	4.45	29.65	11.08	13.86	14.35	9.17	4.35	14.29	3.74	4.21	13.05	10.32	132.52
1901	-----	-----	-----	-----	-----	-----	-----	2.85	1.99	0.16	1.04	7.21	-----
1902	5.04	5.11	-----	-----	15.23	10.37	17.06	7.09	16.45	4.07	15.98	11.77	-----
1903	9.50	14.59	3.89	6.93	6.68	0.46	1.63	1.42	0.93	0.03	2.35	3.39	51.80
1904	3.00	0.81	0.94	0.09	4.90	2.11	9.90	12.50	11.59	4.10	16.31	10.68	76.93
1905	17.01	15.69	5.26	15.49	-----	9.74	17.09	7.41	7.54	14.32	6.38	18.82	-----
1906	18.79	10.03	6.93	2.19	1.92	3.25	1.74	1.34	0.72	1.39	-----	-----	-----
1910	-----	-----	-----	0.80	4.46	1.61	3.15	-----	-----	2.76	0.22	2.16	-----
1911	11.91	10.16	20.49	13.65	6.55	5.34	17.73	6.85	21.59	11.28	7.80	13.50	146.85
1912	16.53	26.91	21.38	17.43	13.61	6.50	4.08	3.59	6.31	13.76	4.35	28.75	163.20
1913	9.00	8.62	1.68	0.13	0.94	1.07	2.34	9.01	8.89	10.31	7.89	9.91	69.79
Mean	8.64	11.06	6.46	5.49	5.73	4.98	6.74	6.08	6.51	5.27	6.78	10.48	84.22
Greatest	18.79	29.65	21.38	17.43	15.23	11.26	17.73	14.29	21.59	14.32	16.31	28.75	163.20
Least	0.32	0.17	0.04	0.09	0.46	0.46	0.91	0.74	0.65	0.03	0.22	0.83	21.40

RANIOLA, NEW BRITAIN, BISMARCK ARCHIPELAGO

1891	13.74	10.63	20.24	10.31	4.68	5.98	4.57	13.42	13.86	7.36	3.19	25.35	133.33
1892	22.52	11.93	12.24	9.33	6.97	3.78	2.72	0.39	7.20	6.34	9.41	13.54	106.37
1893	2.99	-----	-----	12.05	2.80	0.32	1.34	3.42	1.38	1.89	5.71	9.76	-----
1894	2.98	6.95	7.50	5.67	2.61	9.13	5.36	2.64	1.10	2.52	10.00	9.17	65.63
1895	10.71	13.27	9.37	4.76	4.68	2.28	4.96	2.83	7.13	1.81	6.22	14.21	82.23
1896	4.88	6.89	16.93	1.06	5.59	4.37	5.43	12.60	11.77	5.63	1.73	13.66	90.54
1897	21.18	11.89	13.66	9.76	3.19	1.73	-----	-----	3.58	7.56	7.60	4.76	-----
1899	5.71	4.33	3.66	6.65	6.89	2.87	20.51	5.51	3.50	7.01	7.09	16.73	90.46
1900	3.03	6.26	14.49	7.52	7.01	2.40	5.28	1.89	4.41	8.42	3.35	8.70	72.76
1901	17.64	11.81	13.90	8.03	9.29	4.02	8.19	4.25	9.17	2.76	6.65	8.82	104.53
1902	8.86	8.90	6.10	7.52	6.77	10.08	6.10	13.66	3.42	2.20	2.09	7.52	83.22
1903	8.11	5.12	8.94	9.21	1.93	3.15	5.00	3.94	5.67	2.40	10.63	6.69	70.79
1904	14.29	7.95	10.79	5.08	5.39	9.80	5.43	3.23	8.58	7.20	5.55	9.92	93.21
1905	4.17	9.57	3.23	10.87	5.35	8.35	12.56	4.41	1.22	2.20	5.75	13.74	81.42
1906	8.94	5.39	12.68	6.26	7.83	-----	3.31	9.17	2.56	3.07	7.72	2.48	-----
1907	6.02	2.64	16.22	0.39	2.60	2.64	5.51	6.77	6.85	4.92	5.63	12.95	73.14
1908	16.06	13.82	21.97	8.03	7.09	3.31	3.66	12.32	5.83	3.46	5.20	8.70	109.45
1909	10.24	7.52	13.07	5.87	2.60	3.03	2.56	1.38	1.30	6.42	7.09	4.96	66.04
1910	4.17	2.05	3.03	9.17	2.36	0.12	1.10	6.97	1.65	2.28	5.94	3.35	42.19
Mean	9.80	8.16	11.56	7.24	5.03	4.30	5.76	6.04	5.27	4.50	6.13	10.26	84.05
Greatest	22.52	13.82	21.97	12.05	9.29	10.08	20.51	33.66	13.86	8.42	10.63	25.35	133.33
Least	2.98	2.05	3.03	0.39	1.93	0.12	1.10	0.39	1.10	1.81	1.73	2.48	42.19

NOTE: Data for Raniola are incomplete for March and July, 1907.

TULAGI, FLORIDA, SOLOMON ISLANDS

1898	9.51	28.55	27.89	6.67	4.19	4.86	4.86	9.94	10.53	10.23	21.14	8.97	147.34
1899	14.27	12.04	17.47	20.48	8.85	1.26	24.27	8.33	10.92	11.21	7.89	19.03	156.02
1900	12.20	3.09	13.48	2.29	5.83	3.20	3.24	3.01	5.41	9.12	10.62	10.83	82.32
1901	10.93	12.46	10.83	6.75	17.59	10.69	5.53	13.24	10.35	15.60	7.97	11.91	133.85
1902	18.31	27.76	22.39	8.53	4.55	7.85	9.02	14.70	6.25	6.65	6.83	9.86	142.70
1903	3.96	14.12	10.73	5.68	8.84	7.99	7.79	14.28	10.03	10.39	10.69	16.76	116.26
1904	14.78	17.61	23.49	6.75	10.81	2.12	4.32	8.91	5.53	7.01	3.35	6.00	110.68
1905	5.62	21.20	4.62	0.50	1.57	4.73	2.46	2.94	5.74	5.82	7.15	10.14	72.49
1906	9.09	7.83	18.33	11.53	5.30	5.04	7.00	2.80	5.99	9.47	6.35	6.93	95.66
1907	16.72	8.81	12.67	3.71	9.72	3.92	9.71	3.34	5.18	7.41	10.73	15.41	107.33
1908	20.99	24.37	8.01	7.25	6.68	11.07	10.81	4.87	8.43	3.84	15.51	17.55	139.38
1909	13.33	14.06	37.47	9.97	4.65	7.89	5.96	4.72	4.48	7.54	7.96	13.78	131.81
1910	21.70	16.90	17.55	13.42	8.95	4.56	3.32	9.04	7.81	4.95	8.73	18.38	135.31
1911	9.18	33.31	12.50	5.59	12.22	6.07	4.80	7.39	13.63	7.59	2.26	2.14	116.68
1912	14.03	6.27	9.36	6.81	6.24	7.88	4.14	7.08	5.53	10.59	8.13	4.30	90.36
1913	17.48	5.28	13.94	8.23	7.87	6.93	7.28	5.63	7.56	4.76	2.01	2.95	89.92
1914	6.97	23.11	7.52	3.54	2.16	2.05	2.56	0.24	4.21	3.82	1.14	4.80	62.12
1915	10.78	11.65	3.19	2.48	1.06	2.56	1.73	6.06	4.33	3.98	5.47	9.64	62.93
1916	24.61	19.84	16.06	17.87	14.80	8.15	0.75	9.17	14.61	5.71	13.90	16.61	162.08
1917	15.08	14.96	41.93	15.39	10.20	5.87	1.89	6.10	3.82	10.83	11.93	9.33	147.33
1918	12.80	16.54	16.10	9.61	10.43	4.13	10.12	2.36	12.16	9.49	8.35	8.31	120.40
Mean	13.44	16.18	16.45	8.24	7.50	5.66	6.26	6.86	7.74	7.91	8.48	10.65	115.37
Greatest	24.61	33.31	41.93	20.48	17.59	11.07	24.27	14.70	14.61	15.60	21.14	19.03	162.08
Least	3.96	3.09	4.62	0.50	1.57	1.26	0.75	0.24	3.82	3.82	1.14	2.14	62.12

NOUMEA, NEW CALEDONIA

1885	1.76	6.54	5.80	3.44	5.12	2.64	0.51	0.59	0.41	1.80	0.42	1.34	30.37
1886	2.42	10.43	2.67	8.48	2.78	3.24	3.73	0.44	2.49	1.48	6.98	7.32	52.46
1887	1.94	1.35	5.15	8.78	2.05	4.93	1.47	1.75	1.93	0.02	0.18	0.62	30.17
1888	5.06	1.39	2.00	7.16	1.68	0.75	0.62	0.72	1.92	0.42	0.31	0.17	22.20
1889	5.56	1.53	4.91	1.67	4.76	2.70	4.77	4.78	1.83	4.18	1.28	10.02	47.99
1890	9.25	3.12	12.60	7.69	5.80	2.80	6.03	3.52	1.03	5.07	1.75	0.23	58.89
1891	0.25	10.02	9.41	11.49	4.51	4.41	9.91	4.98	3.80	2.15	0.16	2.32	63.41
1892	-----	-----	-----	-----	-----	1.61	-----	-----	4.26	1.56	2.48	-----	-----
1893	4.75	7.20	18.06	2.58	4.24	4.15	7.88	11.43	5.83	1.74	2.89	5.52	75.77
1894	9.16	2.51	9.38	3.46	10.67	4.39	2.20	3.52	5.56	2.43	1.11	0.09	54.48
1895	1.89	10.22	10.73	4.77	0.52	1.99	1.08	1.06	0.98	-----	0.58	0.72	-----
1896	0.74	5.98	-----	4.79	-----	5.78	2.89	-----	-----	3.27	2.10	1.85	-----
1897	10.12	4.36	11.92	3.38	1.85	2.17	1.69	2.01	4.05	0.94	2.17	-----	-----

TABLE 50.—*Precipitation—Monthly and annual totals, means, and extremes (in inches)*—Continued

NOUMEA, NEW CALEDONIA—Continued

Year	January	February	March	April	May	June	July	August	September	October	November	December	Annual
1898	5.72	16.30	7.29	2.55	7.79	1.76	5.47	2.74	0.80	0.78	0.15	2.28	53.63
1899	4.19	5.18	2.50	2.06	2.92	4.39	6.60	5.56	2.08	1.13	1.29	0.07	37.97
1900	1.72	6.58	2.04	4.48	2.38	6.62	3.37	3.74	0.39	1.30	1.56	0.46	34.64
1901	1.22	2.77	12.37	1.76	2.52	1.82	2.48	1.01	1.30	2.53	0.75	0.47	31.00
1902	5.44	1.58	4.63	7.59	1.29	2.37	3.42	1.17	0.61	1.19	0.56	0.00	29.85
1903	0.92	2.03	1.71	1.17	2.79	3.99	1.24	1.24	1.16	1.72	1.85	4.13	23.95
1904	3.40	15.16	8.24	5.51	5.97	5.11	3.34	4.06	0.73	0.35	1.13	1.09	54.08
1905	2.29	3.15	2.86	1.64	0.48	2.83	0.54	1.35	1.21	2.33	0.78	0.18	19.64
1906	0.36	1.85	5.30	0.85	4.99	1.97	2.27	0.96	0.71	1.98	2.46	0.85	24.55
1907	3.77	4.38	1.33	5.40	0.86	3.76	3.08	2.13	0.49	0.26	0.39	1.35	27.20
1908	0.72	4.05	2.46	4.94	5.42	14.70	2.83	2.40	0.15	1.94	8.63	0.43	48.67
1909	5.35	3.84	7.76	3.10	5.81	2.17	2.34	3.25	4.80	1.32	0.74	2.72	43.20
1910	7.20	7.85	14.29	12.16	8.18	7.24	4.74	2.68	T.	1.74	6.98	7.14	80.20
1911	1.83	4.34	6.54	4.89	3.64	0.88	4.64	5.77	0.72	1.38	0.18	0.67	35.48
1912	6.95	2.39	7.57	6.05	5.98	1.37	2.23	3.49	0.81	1.41	1.68	4.89	44.82
1913	7.85	2.02	4.26	2.52	1.34	1.32	8.23	5.33	3.94	1.22	0.57	0.97	39.57
1914	3.39	14.09	3.78	0.59	6.93	1.54	4.68	1.73	0.87	0.59	0.98	3.97	43.14
Mean [3]	3.79	4.77	5.81	5.13	4.50	3.63	3.69	2.69	2.46	2.06	2.35	2.64	43.52
Greatest [3]	11.12	16.30	18.06	13.58	11.73	14.70	13.08	11.43	10.55	6.20	19.06	10.02	75.77
Least [3]	0.23	0.57	0.42	0.55	0.48	0.75	0.57	0.39	0.00	0.02	0.15	0.00	19.65

SUVA, VITI LEVU, FIJI ISLANDS

1886	5.37	8.76	17.96	5.36	4.48	2.95	4.53	5.04	7.66	5.33	9.61	8.02	85.07
1887	8.56	4.95	18.94	12.40	8.90	4.70	3.47	3.09	2.86	8.43	3.71	15.90	95.91
1888	6.51	10.16	13.43	20.18	6.18	14.48	6.06	7.43	7.62	13.57	3.09	3.84	112.55
1889	17.07	9.21	8.30	12.65	9.97	8.71	1.86	5.59	5.03	4.03	29.32	7.35	119.09
1890	21.92	6.99	20.97	4.15	10.41	8.10	0.29	7.34	10.33	6.75	5.88	16.06	119.19
1891	21.02	5.47	18.35	11.86	1.80	1.61	0.70	4.24	3.94	9.11	4.84	7.58	90.52
1892	11.62	5.19	15.54	13.48	4.15	5.92	9.42	4.07	8.02	20.00	6.87	10.25	114.53
1893	9.72	5.78	8.82	10.78	8.60	1.74	2.95	6.80	4.15	18.87	4.70	13.54	96.45
1894	14.87	5.21	6.16	7.84	9.66	3.85	4.71	13.71	7.60	12.13	18.60	7.46	111.80
1895	5.83	11.80	12.42	20.24	14.15	6.31	-----	3.31	7.58	3.75	11.16	9.51	-----
1896	6.77	14.05	8.56	9.49	3.10	1.11	2.04	1.00	8.57	10.55	3.18	11.25	79.67
1897	2.27	6.60	7.42	19.65	4.67	2.62	4.61	3.73	2.57	3.90	14.86	-----	-----
1899	8.48	12.59	7.10	19.89	22.54	3.60	3.71	9.03	14.81	5.00	5.77	16.62	130.40
1900	14.36	12.18	14.53	8.64	2.43	7.80	4.15	12.45	0.99	3.79	4.85	3.70	89.87
1901	14.91	15.23	26.39	9.57	16.37	1.01	1.75	6.15	6.35	5.59	8.11	7.64	119.07
1902	4.45	17.39	20.33	11.26	12.53	3.36	3.80	8.51	7.40	4.72	3.13	5.47	102.35
1903	3.53	4.10	23.01	13.49	2.64	1.45	2.40	2.51	6.46	6.70	10.02	4.78	81.09
1904	14.85	10.10	12.10	10.70	10.30	13.26	7.22	7.96	4.90	10.57	5.31	13.12	120.39
1905	13.55	4.88	12.64	4.84	6.43	2.69	4.69	5.11	0.11	2.67	5.08	10.34	73.03
1906	14.16	5.11	23.56	17.15	11.81	7.91	4.18	37.33	9.77	4.80	11.19	22.65	169.62
1908	5.03	12.49	12.01	13.35	20.32	3.32	6.71	9.31	3.55	4.92	5.23	8.63	104.87
1909	11.64	15.32	11.77	7.46	8.33	2.13	2.63	4.96	4.26	9.17	21.74	12.90	112.31
1910	6.92	11.57	12.04	3.87	14.12	9.89	3.13	8.96	12.91	19.33	12.73	9.59	125.06
1911	18.82	11.33	19.14	5.26	10.39	7.81	6.03	7.18	2.52	3.77	24.41	5.54	122.20
1912	16.32	8.93	12.27	4.71	18.99	4.65	1.75	6.62	6.08	3.47	6.10	25.53	115.42
1913	10.73	5.99	25.21	8.64	5.39	2.41	18.49	3.81	8.40	11.12	6.04	16.32	122.55
1914	6.73	13.50	12.39	20.57	21.97	9.41	2.24	14.36	14.48	7.52	0.53	16.55	140.25
1915	4.80	4.98	25.47	3.38	3.82	5.59	10.15	4.68	5.02	10.57	9.81	11.30	99.57
1916	11.17	17.62	9.96	21.47	14.21	12.90	2.03	20.49	13.63	3.64	11.91	13.31	152.34
Mean [4]	10.72	10.13	14.70	11.28	10.16	6.15	4.60	8.24	6.98	7.80	9.51	12.11	112.38
Greatest	21.92	18.77	26.39	21.47	22.54	14.48	18.49	37.33	14.81	20.00	29.32	25.53	169.62
Least	2.27	4.10	6.16	3.38	1.80	0.83	0.29	0.81	0.11	0.51	0.53	3.29	73.03

MALDEN ISLAND, CENTRAL SPORADES

1890	-----	-----	0.59	0.67	0.28	0.94	0.16	1.38	0.20	0.12	0.55	0.20	-----
1891	0.55	0.08	0.71	1.97	0.94	1.02	1.06	0.59	0.67	0.28	0.00	0.00	7.87
1892	0.63	0.08	2.36	2.40	2.44	3.11	0.59	0.55	0.35	0.16	0.04	0.24	12.95
1893	0.00	0.00	0.43	0.87	1.06	2.00	0.39	0.71	1.46	0.04	0.12	0.20	7.37
1894	0.24	0.35	4.09	7.44	5.20	2.01	0.16	-----	-----	-----	-----	-----	-----
1895	0.12	0.08	1.34	0.91	0.39	0.83	0.47	0.35	0.08	0.16	0.51	0.12	5.36
1896	0.08	0.08	4.92	3.62	5.08	0.28	0.43	0.51	0.43	0.43	0.79	1.89	18.54
1897	2.76	5.63	7.64	-----	-----	0.12	7.13	4.80	0.83	0.00	0.12	0.51	-----
1898	-----	0.35	2.17	5.12	1.85	-----	0.79	0.16	0.47	0.91	0.00	0.00	-----
1899	0.08	0.98	2.17	9.84	3.35	1.10	3.42	2.87	0.47	5.28	0.12	0.16	29.84
1900	19.49	3.39	6.81	2.99	7.56	1.89	4.33	2.24	0.43	0.00	0.00	0.00	49.13
1901	1.54	0.20	0.16	3.03	1.22	0.00	0.59	0.35	0.08	0.12	0.04	0.04	7.37
1902	0.24	0.28	5.12	5.63	6.30	1.73	1.73	5.55	3.03	2.13	8.70	0.47	40.91
1903	15.24	0.35	1.57	3.42	3.70	0.87	0.75	-----	0.00	0.00	-----	-----	-----
1904	-----	-----	0.32	5.00	3.78	1.18	0.75	2.13	1.22	0.87	0.94	1.89	-----
1905	1.54	2.48	13.15	6.50	12.28	12.48	4.72	3.78	2.64	1.14	1.65	0.98	63.34
1906	1.46	4.88	1.46	3.39	4.25	1.06	0.83	3.31	0.28	0.20	0.08	0.35	21.55
1907	0.00	0.20	0.39	0.47	1.14	2.13	2.01	1.50	0.35	0.24	0.39	0.08	8.90
1908	0.12	0.08	0.43	1.22	0.43	0.43	0.32	0.39	0.16	0.12	0.12	0.12	3.94
1909	0.16	0.24	2.24	1.26	2.76	0.94	-----	-----	-----	-----	-----	-----	-----
1910	0.15	0.31	3.38	5.91	0.88	0.33	0.57	0.75	0.05	0.27	0.03	0.00	12.63
1911	1.39	0.00	4.95	2.16	1.28	1.14	0.90	0.88	0.26	1.76	0.04	8.20	22.96
1912	4.06	9.27	1.74	6.42	2.81	1.72	10.10	0.88	0.90	0.78	0.73	0.00	39.41
1913	0.47	1.22	0.59	1.85	6.57	5.32	7.01	-----	-----	-----	-----	1.22	-----
1914	17.01	4.72	25.75	6.77	16.42	3.03	1.02	1.38	2.13	9.57	3.19	2.60	93.59
1915	17.20	4.72	25.67	13.35	4.76	1.18	1.81	0.59	2.48	0.04	0.04	0.08	71.92
1916	1.30	0.08	2.91	2.16	-----	0.51	0.59	0.20	0.32	0.12	0.32	0.20	-----
1917	0.04	0.71	1.46	5.55	3.66	1.81	1.06	1.06	0.71	0.08	0.20	0.16	16.50
1918	0.67	0.24	1.26	5.35	4.41	0.91	0.39	2.91	0.79	1.30	0.59	1.85	20.67
Mean	3.33	1.52	4.34	4.12	3.88	1.79	1.93	1.59	0.80	1.00	0.77	0.83	25.90
Greatest	19.49	9.27	25.75	13.35	16.42	12.48	10.10	5.55	3.03	9.57	8.70	8.20	93.59
Least	0.00	0.00	0.16	0.47	0.28	0.12	0.16	0.16	0.00	0.00	0.00	0.00	3.94

[3] 52 years. [4] 34 years.

TABLE 50.—*Precipitation—Monthly and annual totals, means, and extremes (in inches)*—Continued

APIA, OPOLU, SAMOAN ISLANDS [5]

Year	January	February	March	April	May	June	July	August	September	October	November	December	Annual
1890	15.75	28.23	10.35	17.68	3.74	3.58	1.30	4.72	6.81	7.09	16.14	15.43	130.82
1891	12.52	28.35	11.73	6.61	2.95	4.13	2.36	1.02	4.88	5.71	13.11	21.10	114.47
1892	23.62	6.42	12.01	8.27	19.53	9.80	7.13	16.97	15.90	7.76	9.61	26.46	163.48
1893	18.23	19.80	12.76	1.97	2.01	4.09	2.52	2.28	5.43	7.36	10.51	10.31	97.27
1894	15.90	8.07	14.57	9.45	1.42	5.87	5.24	3.15	1.61	7.20	12.40	13.23	98.11
1895	19.17	17.64	20.35	10.55	4.41	4.41	4.21	3.90	6.61	13.35	6.50	20.04	131.14
1896	20.39	14.09	25.16	6.22	3.42	3.11	0.16	0.08	2.01	5.75	3.90	11.97	96.26
1897	12.99	5.51	8.11	16.42	8.90	12.91	2.72	2.40	3.42	7.16	18.74	10.43	109.71
1898	20.90	22.05	17.99	15.00	3.27	4.53	4.41	7.20	9.17	6.69	9.65	16.14	137.00
1899	29.06	20.67	5.59	17.40	7.05	1.22	2.13	2.64	5.32	4.45	6.73	25.35	127.61
1900	11.54	11.69	26.69	5.32	1.85	0.91	0.71	0.39	0.87	8.03	10.24	10.75	88.99
1901	22.84	15.79	26.77	6.34	8.54	2.44	0.35	1.93	8.70	7.13	8.70	5.39	114.92
1902	22.80	21.97	8.39	11.26	3.11	9.17	0.98	0.39	1.06	3.66	9.84	4.68	97.31
1903	14.37	27.76	6.30	14.65	4.88	10.16	2.91	3.74	7.20	12.80	9.09	11.10	124.96
1904	27.01	24.88	10.79	19.72	6.97	4.68	4.21	4.09	8.19	5.91	6.54	10.83	133.82
1905	14.09	5.35	10.67	6.26	0.39	5.75	2.24	5.04	3.78	2.13	6.54	6.54	68.78
1906	5.47	5.32	18.74	5.35	6.89	6.10	2.95	4.53	3.86	3.50	12.13	10.67	85.51
1907	15.75	17.24	10.24	20.04	4.45	6.81	1.77	0.28	5.83	7.72	20.35	17.01	127.49
1908	39.96	21.26	22.95	13.94	9.84	9.37	1.69	4.88	13.50	5.28	12.91	17.13	172.71
1909	15.63	13.94	11.61	8.35	4.84	1.42	0.20	0.71	0.28	2.95	6.38	4.92	71.23
1910	3.58	7.80	20.67	13.35	7.99	4.17	1.22	3.31	5.08	7.44	12.80	24.49	111.90
1911	14.76	24.41	10.28	4.92	3.66	2.16	3.23	1.73	2.28	1.22	7.16	6.18	81.99
1912	6.85	8.50	9.72	15.35	7.40	5.16	0.71	2.20	3.58	9.76	3.98	4.02	77.23
1913	17.32	29.13	16.38	15.28	11.18	1.30	5.71	1.54	4.72	5.67	7.05	9.88	125.16
1914	6.50	12.72	8.15	10.75	7.01	10.43	5.39	4.45	7.64	12.36	9.37	10.20	104.97
1915	21.30	3.54	16.69	5.16	0.83	3.11	3.07	0.75	4.72	1.97	8.46	23.94	93.54
1916	16.30	14.41	18.07	10.20	14.41	12.36	4.37	5.00	7.64	4.45	9.92	26.46	143.59
1917	25.28	18.27	14.49	10.20	3.31	4.49	5.28	3.31	3.19	9.37	9.17	20.43	126.79
1918	11.97	30.12	7.28	4.13	1.50	4.37	1.18	2.32	4.33	3.35	4.88	21.26	96.69
1919	24.53	6.22	10.47	8.19	5.43	2.83	1.54	4.33	2.05	2.44	8.82	9.84	86.69
Mean [6]	17.70	16.30	14.06	11.10	5.78	5.65	2.70	3.40	5.50	6.42	10.20	14.31	113.12
Greatest	39.96	30.12	26.77	20.04	19.53	12.91	7.13	16.97	15.90	13.35	20.35	26.46	172.71
Least	3.58	3.54	5.59	1.97	0.39	0.91	0.16	0.08	0.28	1.22	3.90	4.02	68.78

AVARUA, RAROTANGA, COOK ISLANDS

1899	12.07	14.01	6.87	11.02	15.73	5.81	1.55	2.77	9.32	2.33	2.26	7.46	91.20
1900	8.51	6.30	5.96	3.30	3.60	2.47	1.23	7.46	5.57	3.47	2.86	10.81	61.54
1901	20.15	6.00	5.41	11.17	7.77	5.52	1.24	6.96	3.29	1.21	4.30	13.11	86.13
1902	14.09	14.02	13.67	5.33	3.58	3.60	1.84	1.77	0.78	2.85	8.48	2.47	72.48
1903	3.05	8.10	6.15	11.14	6.02	1.15	3.11	0.31	5.19	7.95	10.83	2.38	65.38
1904	8.85	9.19	10.73	10.34	5.21	4.18	5.90	3.37	5.07	4.84	1.42	5.35	74.45
1905	4.80	11.06	6.02	14.86	3.82	1.85	5.81	3.39	1.34	4.25	6.62	0.91	64.73
1906	9.54	8.42	9.42	10.08	6.29	1.74	1.72	4.95	1.61	3.90	2.37	8.89	68.93
1907	7.38	13.26	16.28	8.67	10.93	3.64	3.27	3.48	3.69	0.94	4.49	9.97	86.00
1908	4.77	15.43	22.26	5.70	9.10	6.79	4.71	6.86	6.45	7.28	15.52	11.77	116.64
1909	9.14	12.13	11.78	7.98	10.94	10.17	4.24	9.72	5.42	2.34	4.02	5.54	93.42
1910	13.24	9.45	18.33	6.15	4.85	5.86	1.18	8.49	9.00	2.97	8.04	9.26	96.82
1911	7.32	8.92	12.93	6.62	5.67	2.41	6.36	2.96	8.18	3.51	3.16	5.26	73.30
1912	13.58	10.78	10.74	6.15	2.61	3.08	5.97	5.62	3.84	0.71	15.41	6.25	84.74
1913	9.96	5.59	7.72	6.73	8.98	6.81	1.06	2.01	3.50	1.14	5.51	6.89	65.90
1914	7.40	14.25	6.22	4.45	2.05	6.81	1.22	3.54	1.34	17.20	4.09	1.81	70.38
1915	8.01	2.95	9.77	1.68	1.72	1.02	2.13	1.77	0.68	2.00	3.07	11.24	46.05
1916	19.26	-----	38.30	9.15	4.14	2.68	15.11	1.41	5.47	3.84	12.82	5.81	-----
1917	7.76	17.40	12.40	10.47	13.70	3.35	2.20	0.71	3.78	10.71	11.14	10.55	104.17
1918	6.97	18.90	5.08	13.94	1.89	3.62	3.39	13.46	7.36	11.54	3.31	13.70	103.16
Mean	9.80	10.85	11.80	8.25	6.43	4.13	3.66	4.55	4.54	4.75	6.49	7.47	82.72
Greatest	20.15	18.90	38.30	14.86	15.73	10.17	15.11	13.46	9.32	17.20	15.52	13.70	116.64
Least	3.05	2.95	5.08	1.68	1.72	1.02	1.06	0.31	0.68	0.71	1.42	0.91	46.05

PAPEITI, TAHITI, SOCIETY ISLANDS

1879	5.94	15.39	19.45	2.64	5.55	0.87	0.02	1.30	9.88	0.51	5.20	-----	------
1880	[7] 11.57	4.57	2.72	3.46	1.50	1.18	2.80	0.28	1.81	0.87	3.19	5.08	[7] 39.03
1881	5.08	7.83	1.65	7.32	0.87	0.35	0.59	0.51	T.	0.24	1.54	1.61	27.59
1882	2.01	1.02	0.47	0.47	0.43	0.47	0.16	0.00	0.08	0.04	1.38	6.54	13.07
1883	0.87	2.20	0.87	0.63	0.35	0.08	0.00	2.40	2.95	4.61	3.82	8.86	27.64

[5] Sogi, 1890–1902; Mulinuu, 1903–1919.
[6] Average of two series in Table 40.
[7] Approximate.

TABLE 50.—*Precipitation—Monthly and annual totals, means and extremes (in inches)*—Continued

PAPEITI, TAHITI, SOCIETY ISLANDS—Continued

Year	January	February	March	April	May	June	July	August	September	October	November	December	Annual
1884	9.80	12.40	10.12	15.00	1.06	3.66	2.76	2.48	3.82	2.56	0.59	7.36	71.61
1885	29.09	11.02	5.87	9.33	4.92	12.87	0.51	0.43	2.48	0.24	0.51	0.35	77.62
1886	0.55	0.28	1.85	1.54	0.20	0.00	0.83	0.00	0.00	1.18	1.42	4.41	12.26
1887	4.72	0.08	3.94	0.39	3.15	1.22	5.67	0.20	1.65	0.16	7.83	1.06	30.07
1888	22.01	6.26	2.76	3.35	3.70	0.59	1.38	0.20	1.89	0.75	2.76	0.79	46.44
1896	6.78	3.56	5.99	6.17	4.85	4.56	1.18	5.59	2.57	1.33	1.58	6.37	50.53
1897	14.76	15.29	17.93	1.28	3.68	6.12	2.42	0.27	7.68	4.83	17.92	5.43	97.61
1898	7.50	12.77	3.02	3.97	2.52	1.44	0.33	0.04	2.50	1.83	4.85	24.74	65.51
1899	4.44	4.97	6.28	4.99	2.19	1.30	2.85	3.29	4.54	6.30	9.68	3.01	53.84
1900	3.23	6.50	15.52	3.07	11.24	0.87	0.77	3.68	0.35	11.79	5.39	42.43	104.84
1901	22.13	22.77	8.67	5.76	2.86	2.90	6.31	7.36	5.26	21.21	5.20	19.90	130.33
1902	2.74	40.51	4.17	3.67	0.02	3.28	2.07	4.57	4.33	7.81	3.96	4.72	81.85
1903	4.76	8.11	8.00	12.93	12.60	1.06	3.30	5.32	3.16	1.93	10.78	15.93	87.88
1904	10.84	6.26	6.44	4.03	3.87	1.24	3.24	1.65	2.15	2.15	2.61	7.41	51.89
1905	6.06	7.42	7.79	0.00	2.80	4.40	0.48	0.46	0.00	3.27	4.09	2.99	39.76
1906	2.98	4.21	4.65	1.06	4.02	1.26	0.20	4.75	2.09	1.97	2.61	7.41	37.21
1908	4.15	1.40	19.75	2.67	2.72	9.71	0.00	0.00	3.15	12.13	4.15	21.58	81.41
1909	13.39	11.38	13.59	6.05	4.39	6.91	3.04	1.02	0.74	0.72	6.46	11.08	78.77
Mean [8]	8.21	7.44	6.94	4.34	3.33	2.72	1.91	1.63	2.29	3.52	5.18	8.01	55.52
Greatest	29.09	40.51	19.75	15.00	12.60	12.87	6.31	7.36	9.88	21.21	17.92	42.43	130.33
Least	0.55	0.08	0.47	0.00	0.02	0.00	0.00	0.00	0.00	0.04	0.51	0.35	12.26

[8] Means for 35 years.

BIBLIOGRAPHY

References to sources of data are given in connection with text or tabular matter. Since the chief interest attaches to records of precipitation, the most important publications containing monthly and annual values for this meteorological element are listed here.

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