TABLE 2—*Smoothed sun-spot relative numbers*—Continued.

Year.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Mean.
1797	8.8	8.0	7.7	7.0	6.7	6.5	5.9	5.4	5.7	5.9	5.5	4.7	6.5
1798	4.1	3.8	3.5	3.2	3.2	3.8	4.1	4.4	5.1	5.8	6.5	7.3	4.6
1799	7.8	7.8	7.5	7.6	7.3	6.8	7.0	7.1	6.6	5.9	5.4	5.9	6.9
1800	7.2	8.8	10.1	10.9	11.5	13.2	15.3	17.0	18.5	20.4	22.8	24.3	15.0
1801	25.2	26.6	28.3	30.0	32.1	33.7	34.9	36.5	37.7	38.6	39.6	40.7	33.7
1802	41.8	42.8	44.1	45.1	45.1	45.0	45.1	45.4	45.1	43.9	43.2	42.8	44.1
1803	42.4	41.7	40.8	41.2	42.5	43.1	42.9	42.6	43.2	45.1	45.7	45.2	43.0
1804	44.3	44.0	44.6	45.3	46.1	47.0	48.1	48.6	48.6	48.2	47.9	48.3	46.8
1805	48.9	49.2	48.8	47.1	44.9	43.1	41.3	39.8	38.4	37.2	36.3	35.2	42.5
1806	34.2	33.2	31.7	30.7	30.0	28.7	27.0	25.1	23.0	22.3	21.5	20.2	27.3
1807	18.9	17.6	16.3	14.7	13.0	11.1	9.6	8.7	8.0	7.1	6.8	7.0	11.6
1808	6.8	6.4	6.5	6.6	6.8	7.6	8.4	8.9	9.2	8.8	7.9	7.2	7.6
1809	6.7	6.1	5.3	4.6	4.0	3.0	2.2	1.6	1.1	1.0	0.8	0.4	3.1
1810	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1811	0.3	0.6	0.7	1.0	1.3	1.4	1.9	2.4	2.5	2.6	2.6	2.7	1.7
1812	2.5	2.9	3.7	3.7	3.9	4.6	4.5	4.4	4.8	5.5	6.4	7.0	4.5
1813	8.1	8.6	8.7	10.1	11.5	12.0	13.1	14.1	14.3	14.8	15.1	15.3	12.1
1814	15.4	15.2	14.6	14.0	13.5	13.7	13.8	14.5	16.2	17.4	17.9	19.8	15.5
1815	22.2	24.8	27.6	29.2	30.7	33.5	35.7	37.5	41.0	44.1	46.7	47.6	35.1
1816	47.3	43.4	46.1	47.7	48.7	47.3	46.2	46.2	46.7	46.3	44.0	42.8	46.1
1817	43.2	44.5	45.0	43.2	41.6	41.1	41.0	39.5	35.2	32.8	34.4	35.6	39.8
1818	34.6	33.1	32.1	31.9	31.4	30.5	30.3	30.1	29.0	27.3	25.3	23.9	30.0
1819	24.0	23.9	23.2	22.5	23.0	23.7	23.4	23.1	23.4	23.4	23.7	23.1	23.4
1820	21.7	21.2	20.8	19.6	18.1	16.5	15.8	14.9	14.1	13.7	12.1	10.6	16.6
1821	9.5	7.8	6.9	7.3	7.5	7.0	5.7	4.7	5.0	5.6	5.7	5.9	6.6
1822	6.3	6.4	6.1	5.1	4.2	4.0	4.0	4.0	3.3	2.1	1.4	1.2	4.0
1823	0.6	0.2	0.1	0.1	0.1	0.9	2.7	4.0	4.5	5.3	6.2	6.3	2.6
1824	6.3	6.3	7.2	9.1	10.2	9.4	7.9	7.4	8.5	8.8	8.6	9.8	8.3
1825	11.7	14.0	14.8	14.2	14.3	15.7	17.1	17.7	18.4	19.9	21.4	23.0	16.9
1826	24.9	26.3	27.1	28.7	31.3	34.4	37.0	38.9	41.0	42.8	44.7	46.5	35.3
1827	46.9	47.1	49.0	50.5	51.2	50.6	50.5	51.9	52.9	53.9	55.9	59.0	51.6
1828	61.2	62.6	63.6	62.6	62.1	62.5	62.1	61.1	60.7	62.5	63.0	61.1	62.1
1829	61.6	63.2	63.4	64.4	65.8	66.6	67.4	68.7	70.2	71.2	71.7	71.3	67.1
1830	68.9	65.8	65.1	66.6	68.3	69.9	70.8	69.7	69.1	67.3	63.9	61.4	67.2
1831	60.2	60.4	59.6	57.0	53.8	50.0	47.1	46.7	45.3	42.5	41.5	41.4	50.5
1832	39.8	36.6	33.4	31.1	28.9	27.6	26.7	24.2	20.7	17.9	15.7	13.5	26.3
1833	12.1	11.7	11.7	11.3	10.3	9.3	8.3	8.1	7.9	7.5	7.3	7.4	9.4
1834	7.8	7.8	7.7	8.4	10.2	12.2	13.4	13.7	14.7	17.8	21.8	24.3	13.3
1835	27.5	31.9	37.9	44.6	50.4	55.1	60.2	67.1	73.8	80.5	86.7	93.3	59.1
1836	99.5	103.9	105.7	107.2	109.9	116.1	125.6	132.6	136.9	138.2	138.0	139.4	121.1
1837	142.7	145.8	146.9	146.4	145.2	141.5	136.5	130.9	127.4	127.2	127.8	126.2	137.0
1838	121.3	116.7	113.5	111.2	108.6	105.2	101.6	100.8	98.9	93.6	87.4	82.2	103.4
1839	79.6	80.8	85.4	87.9	87.5	86.5	84.7	83.0	81.5	80.7	81.5	81.9	83.4
1840	80.7	76.6	71.1	66.9	64.6	63.6	60.8	56.0	52.5	50.5	49.4	49.7	61.9
1841	48.7	46.7	44.3	41.8	39.5	37.4	36.7	36.2	35.5	34.5	32.1	28.9	38.5
1842	26.6	25.4	24.1	23.8	25.1	25.1	23.9	22.8	21.5	20.2	19.3	18.7	23.0
1843	18.1	17.4	16.2	14.2	12.0	10.9	10.5	10.8	11.5	12.2	12.3	11.7	13.2
1844	11.9	12.9	13.5	14.3	14.6	14.6	15.7	17.6	20.0	22.7	25.7	28.4	17.7
1845	29.9	30.7	31.9	33.7	35.7	38.5	40.6	41.5	42.6	44.0	45.0	46.9	38.4
1846	49.0	50.6	54.8	58.6	60.1	61.3	62.5	63.2	63.9	63.8	63.4	64.9	59.7
1847	66.0	69.8	75.6	83.1	91.5	96.6	102.5	109.3	113.0	116.6	120.3	123.0	97.3
1848	128.3	131.6	128.7	124.2	121.1	122.2	124.2	124.9	125.3	124.6	123.5	120.8	125.0
1849	116.5	110.9	107.7	104.9	101.7	98.5	92.6	87.5	85.2	82.2	79.0	77.7	95.4
1850	75.6	74.0	73.7	73.4	71.5	68.1	66.4	67.0	66.9	66.7	67.2	67.0	69.8
1851	66.6	66.3	65.4	64.2	63.7	64.0	64.2	62.3	60.6	60.8	60.9	59.9	63.2
1852	59.5	59.0	57.0	55.9	56.2	55.3	53.1	50.9	48.9	47.2	45.6	44.5	52.8
1853	44.3	45.0	45.2	44.0	41.9	39.9	38.0	35.9	34.3	32.7	31.3	30.1	38.6
1854	28.2	25.6	23.7	22.0	20.8	20.7	20.4	20.0	19.5	18.4	16.9	15.6	21.0
1855	14.2	12.9	11.4	10.4	9.2	7.5	6.2	5.4	4.5	3.8	3.6	3.2	7.7
1856	3.3	3.6	3.9	3.9	3.8	4.1	4.9	5.5	5.8	6.2	7.6	9.3	5.2
1857	10.5	11.7	13.7	16.8	19.3	21.5	23.8	26.0	29.4	32.7	34.3	36.0	23.0
1858	38.6	41.7	44.8	48.5	51.5	53.6	56.7	60.7	64.3	67.6	71.7	75.5	56.3
1859	78.9	82.6	85.9	87.9	90.8	93.2	93.7	93.7	94.0	93.8	93.9	95.4	90.3
1860	97.2	97.9	97.0	95.4	94.4	95.1	94.9	93.7	93.3	94.5	93.6	90.6	94.8
1861	88.1	85.8	84.5	83.1	80.3	77.8	77.2	76.7	73.7	69.5	67.9	68.1	77.7
1862	67.7	66.7	65.3	63.7	62.5	60.8	58.5	57.6	58.2	58.6	57.6	55.4	61.1
1863	51.9	49.6	47.1	45.2	44.5	44.0	44.4	44.4	44.0	43.8	43.0	43.2	45.4
1864	44.8	46.0	46.6	46.6	47.2	47.5	46.6	45.9	44.4	43.1	42.5	41.3	45.2
1865	39.1	37.2	36.2	35.2	33.2	31.1	29.8	29.0	28.4	27.2	25.9	24.2	31.4
1866	22.8	21.0	19.4	18.7	17.9	16.8	15.0	12.1	9.9	8.7	7.8	6.7	14.7
1867	5.9	5.4	5.2	5.3	5.3	6.3	7.9	9.2	10.5	12.6	14.9	17.1	8.8
1868	19.3	21.5	24.2	27.6	31.7	35.5	39.2	42.9	45.8	47.1	50.5	56.9	36.9
1869	61.4	64.6	68.0	69.4	70.1	72.4	74.6	77.6	84.3	93.8	101.7	105.8	78.6
1870	110.0	116.2	121.6	127.5	134.0	138.0	139.6	140.5	140.2	139.6	138.5	135.4	131.8
1871	132.3	129.3	125.1	120.4	116.3	112.9	110.8	110.3	107.8	103.0	98.9	98.0	113.8
1872	98.9	98.3	99.0	101.0	101.9	101.9	102.0	101.7	101.6	100.9	97.4	92.2	99.7
1873	87.8	85.2	81.4	76.2	71.5	67.7	65.2	62.4	58.4	54.4	52.4	52.0	67.9
1874	51.8	51.5	50.4	49.1	47.4	45.5	42.7	39.1	36.8	36.1	34.6	32.7	43.1
1875	29.8	25.5	22.5	20.5	19.2	17.9	17.1	16.8	16.3	15.1	13.7	12.5	18.9
1876	11.7	11.6	11.7	12.0	11.8	11.4	11.7	11.9	10.8	10.6	11.8	13.0	11.7
1877	13.1	12.6	12.7	12.7	12.6	12.5	11.4	10.4	10.1	9.3	8.0	7.1	11.0
1878	6.6	6.0	5.3	4.6	4.0	3.5	3.3	3.9	2.4	2.3	2.4	2.2	3.9
1879	2.5	3.2	3.7	4.2	5.0	5.7	6.9	9.0	10.9	12.3	13.7	15.8	7.7
1880	17.7	19.8	23.9	27.6	29.7	31.3	32.8	34.4	36.8	39.5	41.6	43.6	31.6
1881	47.0	49.7	49.6	49.9	51.8	53.5	54.6	55.6	57.0	59.5	62.2	62.4	54.4
1882	60.4	58.4	57.9	57.8	58.9	59.9	60.3	60.0	58.1	56.5	54.6	54.5	58.1
1883	57.3	59.0	59.0	59.8	60.9	62.3	65.0	67.9	71.4	73.0	74.2	74.6	65.4
1884	72.4	71.7	72.4	71.3	67.8	64.6	61.4	58.8	56.6	54.2	53.6	55.2	63.3
1885	57.1	57.4	56.2	54.9	54.4	53.2	51.6	49.2	47.6	47.4	45.2	41.1	51.3
1886	37.2	34.3	32.2	30.2	27.5	25.8	24.6	23.2	20.5	16.7	14.7	13.8	25.1
1887	13.1	13.0	12.6	11.9	12.1	12.7	13.2	13.0	12.9	13.0	12.4	11.5	12.6
1888	10.3	8.6	7.9	7.8	7.8	7.3	6.3	5.8	5.8	5.8	5.6	5.3	7.0
1889	5.6	6.6	7.2	7.1	6.7	6.3	6.5	6.3	5.9	5.7	5.7	5.6	6.3
1890	5.5	5.0	5.0	5.8	6.6	7.0	7.4	8.6	9.8	10.8	13.1	16.5	8.4
1891	20.5	23.5	26.0	29.2	32.2	34.6	37.9	42.5	46.3	50.0	53.7	56.5	37.7
1892	58.4	62.0	65.2	66.4	68.1	71.0	73.2	73.4	73.9	75.3	76.3	77.0	70.0
1893	78.0	79.7	81.5	82.5	83.3	84.3	85.3	86.1	86.0	85.2	85.6	86.7	83.7
1894	87.9	86.2	83.2	82.5	81.6	79.4	77.2	75.6	75.3	75.4	73.8	71.3	79.1
1895	67.7	65.2	64.8	64.2	63.5	63.5	62.5	60.7	59.9	58.2	55.1	52.5	61.5
1896	51.5	49.6	48.0	46.5	44.5	43.0	42.3	41.6	39.5	38.0	37.1	35.2	43.1
1897	32.9	32.0	31.2	30.1	28.3	26.6	25.8	25.7	26.3	26.0	25.6	26.3	28.1
1898	26.0	25.6	25.4	25.7	27.5	27.6	26.3	24.7	22.7	21.9	21.1	20.3	24.6
1899	20.4	19.4	17.1	15.1	13.2	12.2	11.7	11.5	11.2	10.9	11.3	11.3	13.8
1900	10.7	10.5	10.6	10.6	10.4	9.9	9.1	8.2	7.6	6.8	5.9	5.4	8.8
1901	4.8	4.4	3.9	3.2	2.8	2.8	.....	.....	.....	.....	.....	.....	.....

TABLE 3.—*Epochs of sun-spot maxima and minima.*

Minima.	Weight.	Maxima.	Weight.	Minima.	Weight.	Maxima.	Weight.
1610.8	5	1615.5	2	1755.2	9	1761.5	7
1619.0	1	1626.0	5	1766.5	5	1769.7	8
1634.0	2	1639.5	2	1775.5	7	1778.4	5
1645.0	5	1649.0	1	1784.7	4	1788.1	4
1655.0	1	1660.0	1	1798.3	9	1805.2	5
1666.0	2	1675.0	2	1810.6	8	1816.4	8
1679.5	2	1685.0	2	1823.3	10	1829.9	10
1689.5	2	1693.0	1	1833.9	10	1837.2	10
1698.0	1	1705.5	4	1843.5	10	1848.1	10
1712.0	3	1718.2	6	1856.0	10	1860.1	10
1723.5	2	1727.5	4	1867.2	10	1870.6	10
1734.0	2	1738.7	2	1878.9	10	1883.9	10
1745.0	2	1750.3	7	1889.6	10	1894.1	10

	Year.
Mean date of minima	1744.21 ± 0.30
Mean date of maxima	1749.37 ± 0.43
Length of the period from the minima	$= 11.141 \pm 0.036$
Length of the period from the maxima	$= 11.091 \pm 0.05_3$
Length of the period in general, or ½ (max. + 2 min.)	$= 11.124 \pm 0.03_0$

TABLE 4.—*Mutual relations of maxima and minima.*

Date of— Min.	Date of— Max.	Interval. Max. — min. = *a*.	Interval. Min. — max. = *b*.	Ratio, *a* : *b*.	$r_{max.}$	Σ *r*, min. to min.	Length of period, *P*, min. to min.	$r_{mean} = \frac{\Sigma r}{P}$.
		Years.	*Years.*				*Years.*	
1745.0	1750.3	5.3	4.9	1.08	83	.....	.....	.....
1755.2	1761.5	6.3	5.0	1.26	80	471.6	11.3	42
1766.5	1769.7	3.2	5.8	0.55	103	533.0	9.0	59
1775.5	1778.4	2.9	6.3	0.46	151	615.8	9.2	67
1784.7	1788.1	3.4	10.2	0.33	133	840.9	13.6	62
1798.3	1805.2	6.9	5.4	1.28	47	281.6	12.3	23
1810.6	1816.4	5.8	6.9	0.84	46	238.0	12.7	19
1823.3	1829.9	6.6	4.0	1.65	67	394.7	10.6	37
1833.9	1837.2	3.3	6.3	0.52	137	653.9	9.6	68
1843.5	1848.1	4.6	7.9	0.58	125	691.8	12.5	55
1856.0	1860.1	4.1	7.1	0.58	95	548.7	11.2	49
1867.2	1870.6	3.4	8.3	0.41	132	617.3	11.7	53
1878.9	1883.9	5.0	5.7	0.88	65	382.8	10.7	36
1889.6	1894.1	4.5	*7.4	*0.61	84	*458.8	*11.9	*39

*These figures depend on assumed values of the date and the *r* for the minimum of 1901.5.

CLIMATOLOGY OF COSTA RICA.

Communicated by H. PITTIER, Director, Physical Geographic Institute.

[For tables see page 204.]

Notes on the weather.—On the Pacific slope the weather was hot and sultry, with occasional showers but no proper beginning of the rainy season, although the average rainfall was generally above the normal. In San Jose the pressure was slightly below normal; the nights were hot and oppressive and the days rather cool and damp. The sunshine was much below normal (154 against 205 hours). On the Atlantic slope the rainfall was heavy and continuous, causing great damage to cacao growers.

Notes on earthquakes.—April 10, $11^h\ 8^m$ p. m., slight but strong shock, E-W, duration 7 seconds, intensity IV. April 13, $10^h\ 54^m$ p. m., prolonged tremors, ENE-WSW, duration 23 seconds, intensity IV. The severe earthquakes which were felt between April 18 and 22 in Guatemala, Honduras, and Salvador, the center of the disturbed region apparently being in the Altos of Guatemala, where Quezaltenango was almost entirely ruined, do not seem to have reached the southern part of Central America.

HAWAIIAN CLIMATOLOGICAL DATA.

By CURTIS J. LYONS, Territorial Meteorologist.

GENERAL SUMMARY FOR APRIL, 1902.

The water in artesian wells rose during the month from 34.05 to 34.10 feet above mean sea level. The average daily mean sea level for the month was 9.75 feet, 10.00 representing the assumed annual mean.

Trade wind days, 24 (8 of north-northeast); normal, 20; average force of wind (during daylight), Beaufort scale, 2.6; cloudiness, tenths of sky, 4.1; normal, tenths of sky, 5.1.

Approximate percentages of district rainfall as compared with normal: Hilo, 80; Hamakua, 100; Kohala, 120; Waimea,

120; Kona, 60; Kau, 40; Puna, 100; Maui, 175; Oahu, extremely variable, from 55 in Honolulu to 200 in Koolau; Kauai, 175. The heavist rainfall for the month was at Nahiku, NE. Maui, 1600 feet elevation, 39.60, with 12.32 in twenty-four hours. At Waiopae, 15 miles distant, no rain for the month.

Mean temperatures: Pepeekeo, Hilo district, 100 feet elevation, average maximum, 76.4°; average minimum, 67.5°; Waimea, Hawaii, 2,730 elevation, 75.3° and 59.6°; Kohala, 521 elevation, 76.1° and 65.1°; Waiakoa, Kula, Maui, 2,700 elevation, 78.7° and 58.1°; Nahiku, Maui, 1,600 elevation, 72.6° and 61.7°; United States Magnetic Observatory, 83.4° and 63.8°; Ewa Mill, 80.7° and 64.3°.

Mr. Fleming, at the Magnetic Observatory, reports 9 a. m. dew-point, 61.9°; relative humidity, 64.2 per cent; 9 p. m., 61.5° and 78.2; mean 61.6° and 71.1; Ewa, mean dew-point, 60°; mean humidity, 68; Kohala, mean dew-point, 64°; mean humidity, 80.

Earthquake on Hawaii on the 7th, 10:03 p. m., also noticed at Honolulu. Heavy surf, 1st to 3d, 9th, 20th and 28th.

The month was, on the whole, uneventful in the meteorological line.

Rainfall data for April, 1902.

Stations.	Elevation.	Amount.
HAWAII.		
HILO, e. and ne.	*Feet.*	*Inches.*
Waiakea	50	9.48
Hilo (town)	100	10.23
Kaumana	1,250	14.04
Pepeekeo	100	7.90
Hakalau	200	11.05
Honohina	300	15.11
Laupahoehoe	500	18.50
Ookala	400	7.57
HAMAKUA, ne.		
Kukaiau	250	8.23
Do	900	.....
Paauilo	750	.....
Paauhau (Mill)	300	6.36
Honokaa (Muir)	425	7.57
Kukuihaele	700	9.36
KOHALA, n.		
Niulii	200	6.28
Kohala (Mission)	521	5.97
Kohala (Sugar Co.)	235	6.38
Hawi Mill	600	6.25
Puuhue Ranch	1,847	2.94
Waimea, c	2,720	3.60
KONA, W.		
Kailua	950	.....
Holualoa	1,350	1.70
Kealakekua	1,580	2.52
Napoopoo	25	1.11
KAU, se.		
Kahuku Ranch	1,680	0.72
Waiohinu	1,000	1.54
Honuapo	15	1.44
Naalehu	650	0.28
Hilea	310	1.50
Pahala	850	1.04
Moaula	1,700	.....
PUNA, e.		
Volcano House	4,000	4.98
Olaa, Mountain View	1,700	18.29
Kapoho	110	.....
MAUI.		
Waiopae Ranch, s	800	0.00
Kaupo (Mokulau), s	285	2.53
Kipahulu, s	300	7.04
Hamoa Plantation, se	60	13.84
Nahiku, ne	60	.....
Do	800	28.52
Do	1,600	39.60
Haiku, n	700	9.00
Kula (Waiakoa)	2,700	0.72
MAUI—*Continued.*	*Feet.*	*Inches.*
Puuomalei, n	1,400	7.96
Paia, n	180	5.20
Haleakala Ranch, n	2,000	3.16
Wailuku, ne	200	6.80
OAHU.		
Punahou (W. B.), sw	47	1.57
Kulaokahua, sw	50	.....
Makiki Reservoir	120	1.14
U. S. Naval Station, sw	6	1.30
Kapiolani Park, sw	10	1.23
Manoa (Woodlawn Dairy), c	285	4.93
Manoa (Rhodes)	300	10.02
School street (Bishop), sw	50	1.48
Pacific Heights, sw	700	.....
Insane Asylum, sw	30	1.28
Kalihi-Uka, sw	260	6.89
Nuuanu (W. W. Hall), sw	50	1.33
Nuuanu (Wyllie street), sw	250	2.78
Nuuanu (Elec. Station), sw	405	4.00
Nuuanu (Luakaha), c	850	25.06
Waimanalo, ne	25	1.52
Maunawili, ne	300	18.57
Ahuimanu, ne	350	12.58
Kahuku, n	25	1.24
Waialua, n	20	1.84
Wahiawa, c	900	1.33
Ewa Plantation, s	60	2.82
Waipahu, s	200	1.91
Moanalua, sw	15	1.13
U. S. Magnetic Station	50	1.03
KAUAI.		
Lihue (Grove Farm), e	200	5.20
Lihue (Molokoa), e	300	3.97
Lihue (Kukaua), e	1,000	10.98
Kealia, e	15	0.94
Kilauea, ne	325	5.32
Hanalei, n	100	17.46
Haena	15	8.59
Waiawa, sw	32	0.30
Eleele, s	200	.....
Wahiawa Mountain, s	2,100	.....
Lawai	450	5.00
McBryde (Residence)	850	4.46
Delayed March reports.		
Waiopae	.....	20.56
Kailua	.....	9.06
Pahala	.....	11.50
Moaula	.....	10.97
Wyllie Street	.....	22.43

OBSERVATIONS AT HONOLULU.

The station is at 21° 18′ N., 157° 50′ W.

Hawaiian standard time is 10h 30m slow of Greenwich time. Honolulu local mean time is 10h 31m slow of Greenwich.

Pressure is corrected for temperature and reduced to sea level, and the gravity correction, —0.06, has been applied.

The average direction and force of the wind and the average cloudiness for the whole day are given unless they have varied more than usual, in which case the extremes are given. The scale of wind force is 0 to 12, or Beaufort scale. Two directions of wind, or values of wind force, or amounts of cloudiness, connected by a dash, indicate change from one to the other.

The rainfall for twenty-four hours is measured at 9 a. m. local, or 7.31 p. m., Greenwich time, on the respective dates.

The rain gage, 8 inches in diameter, is 1 foot above ground. Thermometer, 9 feet above ground. Ground is 43 feet, and the barometer 50 feet above sea level.

Meteorological Observations at Honolulu, April, 1902.

Date.	Pressure at sea level.	Temperature.		During twenty-four hours preceding 1 p. m. Greenwich time, or 1:30 a. m. Honolulu time.									Total rainfall at 9 a. m., local time.
				Temperature.		Means.		Wind.		Average cloudiness.	Sea-level pressures.		
		Dry bulb.	Wet bulb.	Maximum.	Minimum.	Dew-point.	Relative humidity.	Prevailing direction.	Force.		Maximum.	Minimum.	
	*	†	†			‡	‡		§				
1	29.89	67	65	78	64	65.3	86	nne.	3-1	4-1	29.89	29.80	0.01
2	29.85	67	66.3	75	65	66.0	88	n-se.	1-0	6	29.93	29.84	0.10
3	29.86	65	64.3	74	66	67.3	90	e.	1-0	8	29.92	29.84	0.06
4	29.89	66	65.5	76	64	66.7	91	e.	1-0	8	29.96	29.85	0.18
5	29.98	70	65	77	64	66.5	86	nne.	1-3	6	30.01	29.88	0.60
6	30.04	70	65	75	67	62.7	75	nne.	3	2	30.09	29.97	0.01
7	30.07	70	63.5	75	67	62.7	75	ne.	3-5	3	30.12	30.02	0.00
8	30.06	67	63.5	77	68	60.7	68	ne.	4	2-6	30.12	30.02	0.00
9	30.04	70	64.5	78	63	61.3	72	ne.	3	3-10	30.14	30.04	0.00
10	30.00	66	64	78	69	62.7	73	ne.	3	7	30.11	30.00	0.00
11	29.97	63	61	80	65	63.5	78	s-sw.	1-0	5-2	30.05	29.95	0.00
12	30.01	61	58.5	80	61	61.7	76	sw-w.	1-0	1	30.04	29.96	0.00
13	30.04	68	64	80	61	61.0	72	s-ne.	1	1-3	30.09	30.01	0.03
14	29.99	69	64.5	78	63	64.5	80	nne.	1-3	5	30.09	29.99	0.03
15	29.97	69	65.5	75	68	62.0	70	nne.	3	1	30.03	29.94	0.04
16	30.00	67	65	79	66	63.0	71	ne.	2	1-3	30.02	29.92	0.00
17	30.07	73	66.5	80	66	64.3	74	ne.	3	4-2	30.11	30.00	0.01
18	30.11	73	66	79	72	63.5	67	ne.	4	3	30.16	30.07	0.00
19	30.09	72	64.5	79	71	62.0	65	ne.	4	3	30.16	30.07	0.00
20	30.09	71	65	79	71	63.3	70	ne.	4-3	3	30.14	30.05	0.05
21	30.03	71	65.5	79	70	62.0	71	ne.	3-1	4-2	30.13	30.02	0.00
22	30.08	72	64	80	66	63.3	70	ne.	3	3	30.11	30.01	0.00
23	30.08	72	65	79	71	59.5	63	ne.	4-2	2	30.14	30.06	0.01
24	30.07	70	64.5	77	70	63.0	72	ne.	4	4	30.13	30.04	0.13
25	30.03	70	61	77	66	62.3	72	ne.	4	4	30.10	30.00	0.08
26	29.99	68	60	76	68	56.0	58	nne.	3-6	2	30.08	29.99	0.00
27	29.99	68	61	74	66	54.7	61	nne.	4-2	9-0	30.05	29.99	0.02
28	29.96	69	63	75	66	58.0	66	nne.	3-5	4	30.02	29.93	0.09
29	29.94	70	63.5	75	66	60.0	68	nne.	3	7	29.99	29.92	0.12
30	29.96	68	63.5	76	68	60.7	65	e-nne.	4-2	7-3	29.99	29.91	0.00
Sums	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.57
Means	30.005	68.7	63.9	77.4	66.7	61.9	72.5	.....	2.6	4.1	30.064	29.970	.....
Departure	—.015	.....	.....	.....	.....	—1.1	+1.0	.....	.....	—1.0	.....	.....	.....

Mean temperature for April, 1902, (6+2+9)÷3=71.8; normal is 72.8. Mean pressure for April, 1902, (9+3)÷2=30.017; normal is 30.032.

* This pressure is as recorded at 1 p. m., Greenwich time. † These temperatures are observed at 6 a. m., local, or 4.31 p. m., Greenwich time. ‡ These values are the means of (6+9+2+9)÷4. § Beaufort scale.

RECENT PAPERS BEARING ON METEOROLOGY.

W. F. R. PHILLIPS, in charge of Library, etc.

The subjoined titles have been selected from the contents of the periodicals and serials recently received in the library of the Weather Bureau. The titles selected are of papers or other communications bearing on meteorology or cognate branches of science. This is not a complete index of the meteorological contents of all the journals from which it has been compiled; it shows only the articles that appear to the compiler likely to be of particular interest in connection with the work of the Weather Bureau:

Scientific American. New York. Vol. 86.

—— An acetylene Wireless Telephone Apparatus. P. 296.

Scientific American Supplement. New York. Vol. 53.

Vandevyver, —. The action of Electricity upon Frost. P. 22032.

—— The Gases of the Atmosphere. Pp. 22082–22084.

Science. New York. N. S. Vol. 15.

Moore, J. W. A Mud Shower. P. 714.

Ward, R. DeC. Loss of Life in the United States by Lightning. [Note on bulletin by Prof. A. J. Henry.] P. 756.

Ward, R. DeC. Temperature, Rainfall, and Sun-spots in Jamaica. [Note on article by Maxwell Hall.] Pp. 756–757.

Ward, R. DeC. Climate of Western Australia. [Note on publication from Perth Observatory.] P. 757.

Aeronautical Journal. London. Vol. 6.

Moedebeck, W. L. The Development of Aerial Navigation in Germany. Pp. 24–28.

Barton, F. A. Further Notes on the Barton Air-ship. Pp. 30–38.

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Ward, R. DeC. The Dustfall of March 9–12, 1901. [Note on monograph by Hellmann and Meinardus.] P. 141–142.

Popular Science News. New York. Vol. 36.

Bartlett, Arthur K. The Zodiacal Light. Pp. 102–103.