in the afternoon. From the 20th to 30th the weather was windy and cloudy, with daily rains in the northern range of the Cordillera. The short shower on the 21st, at San Jose, had no action whatever on the soil, which remains unusually dry and dusty. On the Atlantic slope the first half of the month was pretty dry, with only occasional showers; the second half rather wet.

Earthquakes.—April 13, slight tremors at 4h. 42m. p. m. April 16, 1h. 23m. p. m., strong shock, northwest to southeast; duration, 5 seconds; intensity, 2. April 30, 3h 33m. p. m., slight tremors.

TABLE 3.—*Rainfall at stations in Costa Rica*, 1901.

Stations.	January.		February.		March.		April.	
	Amount.	No. rainy days.	Amount.	No. rainy days.	Amount.	No. rainy days.	Amount.	No. rainy days.
	Mm.		*Mm.*		*Mm.*		*Mm.*	
1. Boca Banano	265	17	98	11	278	14	219	16
2. Limon	304	19	72	9	214	15	193	12
3. Swamp Mouth	.....	.....	131	10	241	13	302	11
4. Zent	.....	.....	.....	.....	.....	.....	246	14
5. Gute Hoffnung	411	15	106	14	224	12	235	11
6. Siquirres	406	10	45	4	160	8	.....	.....
7. Guapiles	340	13	114	8	.....	.....	221	7
8. Sarapiqui	.....	.....	.....	.....	.....	.....	243	19
9. San Carlos	301	19	67	14	96	13	110	13
10. Las Lomas	521	16	131	10	181	14	66	4
11. Peralta	335	11	65	4	190	13	150	9
12. Turrialba	.....	.....	.....	.....	.....	.....	85	10
13. Juan Vinas	159	14	40	10	12	6	50	8
14. Santiago	.....	.....	.....	.....	.....	.....	66	9
15. Paraiso	.....	.....	.....	.....	.....	.....	.....	.....
16 San Rafael C	.....	.....	.....	.....	.....	.....	.....	.....
17. Tres Rios	2	1	5	1	0	0	2	1
18. La Palma	.....	.....	.....	.....	.....	.....	.....	.....
19. S. Francisco G.	7	2	9	1	26	1	1	1
20. San Jose	4	2	9	1	24	1	1	1
21. La Verbena	.....	.....	5	2	6	2	1	1
22. San Isidro Alajuela	0	0	1	1	.....	.....	8	1
23. Nuestro Amo	.....	.....	11	2	50	3	0	0
24. Sipurio	.....	.....	.....	.....	149	12	229	13

TABLE 4.—*Zent (station of the United Fruit Company), April*, 1901.

		7 a. m.	1 p. m.	6 p m.	Mean.
Temperature (degrees)		22.27	28.86	25.58	25.73
Relative humidity (per cent)		90	69	84	79
Cloudiness (per cent)		53	59	60	58
Temperature of the soil (degrees)	0.15 m.	27.38	27.32	27.66	27.46
	0.30 m.	27.43	27.35	27.43	27.39
	0.60 m	27.69	27.67	27.63	27.66

Sunshine.

Hours a m.	6-7	7-8	8-9	9-10	10-11	11-12	Total.
Per cent	0.54	12.48	15.91	16.44	16.63	14.67	.....
Hours p. m.	**12-1**	**1-2**	**2-3**	**3-4**	**4-5**	**5-6**	
Per cent	15-17	14.26	13.30	10.35	5.31	0.0	135.06

MONTHLY STATEMENT OF AVERAGE WEATHER CONDITIONS FOR APRIL.

By Prof. E. B. GARRIOTT.

The following statements are based on average weather conditions for April, as determined by long series of observations. As the weather of any given April does not conform strictly to the average conditions, the statements can not be considered as forecasts:

In the middle latitudes of the North Atlantic Ocean west of the thirtieth meridian storms are less frequent, while to the eastward of the thirtieth meridian and between the fortieth and sixtieth parallels storms are more frequent than during the preceding three months. There is an increase in the number of foggy days from the Grand Banks to the coast of the United States, and icebergs are likely to be encountered near Newfoundland and the Grand Banks as far south as the forty-first parallel, and possibly to the fortieth parallel.

In the West Indies April is the last month of what is generally termed the dry season. The wet season, which begins in May, continues through October.

Although the well-marked wet season of the Pacific coast of the United States extends from October to March, the monthly rainfalls gradually diminish from December and January to July and August. The latter two months named cover a practically rainless period in that section. Over the interior of the United States a large proportion of the more important storms of April develop on the middle-eastern slope of the Rocky Mountains, and move thence north of east over the Lake region and New England. On the Great Lakes and along the middle Atlantic and New England coasts the near approach of a storm of this type is indicated by rapidly-falling barometer and increasing east to south winds.

In the trucking districts of the interior of the Gulf and South Atlantic States damaging frost is likely to occur in April. Frost is likely to occur in the early part of the month in the Pacific Coast States, in the region immediately bordering the Gulf of Mexico, and in the north half of the Florida Peninsula.

MEXICAN CLIMATOLOGICAL DATA.

Through the kind cooperation of Señor Manuel E. Pastrana, Director of the Central Meteorologic-Magnetic Observatory, the monthly summaries of Mexican data are now communicated in manuscript, in advance of their publication in the Boletin Mensual. An abstract, translated into English measures, is here given, in continuation of the similar tables published in the MONTHLY WEATHER REVIEW since 1896. The barometric means have not been reduced to standard gravity, but this correction will be given at some future date when the pressures are published in our Chart IV.

Mexican data for April, 1901.

Stations.	Altitude.	Mean barometer.	Temperature.			Relative humidity.	Precipitation.	Prevailing direction.	
			Max.	Min.	Mean.			Wind.	Cloud.
	Feet.	*Inch.*	° *F.*	° *F.*	° *F.*	%	*Inch.*		
Leon (Guanajuato)	5,901	24.26	89.1	45.7	69.3	31	0.03	nw.	sw.
Linares (Nuevo Leon)	1,188	28.62	102.2	50.0	76.3	58	1.34	s.	s.
Mazatlan	25	29.87	79.0	60.4	70.3	76	.....	nw.	sw.
Mexico (Obs. Cent.)	7,472	23.02	84.2	44.8	64.8	41	0.53	nw.	sw.
Morelia (Seminario)	6,401	23.93	83.7	49.6	65.8	47	0.35	s.	w.
Puebla (Col. Cat.)	7,125	23.36	84.0	50.0	67.5	43	0.40	e.	wsw.
Saltillo (Col. S. Juan)	5,399	24.73	87.8	42.8	65.1	63	2.16	ne.	s.
S. Isidro (Hac. de Gto)	.....	.....	77.9	64.4	.....	.....	0.08	ne., w.	.....
Zapotlan (Seminario)	5,078	25.04	89.6	49.6	70.7	63	.....	sse.	w.

RECENT PAPERS BEARING ON METEOROLOGY.

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

The subjoined list of titles has 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:

Popular Science Monthly. New York. Vol 59.
Cook, F. A. Aurora Australis. Pp. 21-33.

Scientific American. New York. Vol. 84.
—— Hofman's Flying Machine. P. 281.
Scientific American Supplement. New York. Vol. 51.
—— Heinrich Suter's Airship. P. 21203.
Journal of the Franklin Institute. Philadelphia. Vol. 151.
Balch, E. S. Antarctica: A History of Antarctic Discovery. Pp. 321–341.
Nature. London. Vol. 63.
Gregory, J. W. Work of the National Antarctic Expedition [Program of]. Pp. 609–612.
Pearson's Magazine. London. Vol. 11.
Tindal, Marcus. The Kite Craze. Pp. 497–505.
Memorias y Revista, Sociedad Cientifica "Antonio Alzate." Mexico. Tomo 15.
Moreno y Anda, M. Datos para contribuir al estudio Climatologico del valle de Mexico: La variabilidad interdiurna media de la temperatura en Tacubaya. Pp. 189–200.
Science. New York. N. S. Vol. 13.
Clayton, H. H. Clayton's Eclipse Cyclone and the Diurnal Cyclones. Pp. 747–750.
Philosophical Magazine. London. Vol. 1. *6th Series.*
Zahm, A. F. Resistance of the Air at Speeds below One Thousand Feet a Second. Pp. 530–535.
Villari, Emilio. How Air subjected to X-rays loses its Discharging Property, and how it produces Electricity. Pp. 535–538.
Barus, C. Change of Colors of Cloudy Condensation with the Number of Available Nuclei, and on the Effect of an Electric Field. Pp. 572–579.
Majorana, Quirino. Relative Luminous Intensities of Sun and Sky. Pp. 555–562.
Ciel et Terre. Bruxelles. 21me année.
Arctowski, H. Sur les variations périodiques des aurores australes observées à bord de la *Belgica*. Pp. 79–91, 113–123.
Wolfer, A. Les centres principaux de l'activité solaire. Pp. 105–112.
Journal of School Geography. Vol. 5.
Hubbard, George D. Meteorologic conditions of the South Polar Regions. Pp. 161–170.
Quarterly Journal of the Royal Meteorological Society. London. Vol. 27.
Williams, C. Theo. Climate of Norway and its Factors. Pp. 105–115.
—— Dew Ponds. Pp. 115–116.
Mawley, Edward. Report on the Phenological Observations for 1900. Pp. 117–140.
Watson, A. E. Review of Past Severe Winters in England, with Deductions therefrom. Pp. 141–151.
La Nature. Paris. 29me année.
Molina, F. Les tirs contre la grèle. Pp. 371–374.
Annuaire de la Société Météorologique de France. Tours. 49me année.
Angot, A. La température à Paris pendant les cinquante années 1851–1900. Pp. 57–60.
Goutereau, Ch. Sur le régime des vents forts à Nice. Pp. 61–63.
Annalen der Physik. Leipzig. Vierte folge. Band 4.
Schultze, Hugo. Die innere Reibung von Argon und ihre Aenderung mit der Temperatur. Pp. 140–165.
Breitenbach, Paul. Ueber die innere Reibung der Gase und deren Aenderung mit der Temperatur. P. 166–169.
Gaea. Leipzig. 37 Jahrg.
Klein, H. J. Ein neuer Wetterprophet. Pp. 351–354.
Comptes Rendus. Paris. Tome 132.
Bertainchand, E. Sur les poussières atmosphériques observées à Tunis, le 10 mars 1901. Pp. 1153–1155.
Meteorologische Zeitschrift. Band 18. *Wien.*
Polis, P. Beiträge zur Gewitterkunde im Hohen Venn und der Eifel. P. 97–106.
Koppen, W. Versuch einer Klassifikation der Klimate, vorzugsweise nach ihren Beziehungen zur Pflanzenwelt. P. 106–120.
Messerschmitt, J. B. Ueber die Halophänomene. P. 120–131.
—— Vereinsnachrichten. Pp. 131–133.
—— Seeland, Ferdinand. P. 133.
Obermayer, A. v. Peter Lechner. P. 133.
—— Pilot Charts of the North Atlantic and Mediterranean. P. 134.
Hergesell, —. Vorläufige Mittheilung über die internationale Ballonfahrt vom 7 Februar 1901. P. 134.
Hergesell, —. Vorläufige Mittheilung über die internationale Ballonfahrt vom 7 März 1901. P. 172.
Pernter, J. M. Hagelschäden trotz Wetterschiessens. P. 135.
Hann. Möglichkeit einer telephonischen Verständigung mittelst eines auf den Schnee gelegten Leitungsdrahtes. P. 136.
Mazelle, Ed. Staubfall. P. 137.
—— Vorläufige Berichte über die Staubfälle am 10 März. P. 138.
Hellmann, G. Vorläufige Mittheilung über den Staub-Regenfall in Norddeutschland am 11 März 1901. P. 138.
—— Ein Signalapparat für ferne Gewitter. P. 139.
—— Eine neue Studie über Meteorologie während der Sonnenfinsterniss. P. 140.
Hellmann, G. Die Entwickelung der meteorologischen Beobachtungen bis zum Ende des 17 Jahrhunderts. Pp. 145–157.
Klein, Hermann J. Cirrus-Studien. Pp. 157–172.
Rona, S. Bemerkungen zu dem Staubfall im März. P. 173.
Angstrom, Knut. Intensität der Sonnenstrahlung in verschiedenen Höhen, nach Untersuchungen auf Teneriffa 1895 und 1896. P. 174.
Groneman, H. J. H. Kappenbildung bei Cumuli. P. 176.
—— Die Meteorologische Abtheilung der 72 Versammlung Deutscher Naturforscher und Aerzte zu Aachen in den Tagen vom 17–22 September 1900. P. 177.
Kesslitz, W. Starke Luftdruckschwankung, beobachtet in Pola am 14 Januar 1901. P. 180.
Chabot. J. J. Taudin. Grünstrahlung bei Sonnenaufgang. P. 181.
Krebs, W. Atmosphärische Optik im Elsass 2. F. 181.
Pernter, J. M. Sonnenhof (Kranz). P. 183.
Fischbach, K. v. Der Wald als Quellenspender. P. 183.
Wolfer, A. Provisorische Sonnenflecken-Relativzahlen für das 1 Quartal 1901. P. 185.

OBSERVATIONS AT HONOLULU.

Through the kind cooperation of Mr. Curtis J. Lyons, Meteorologist to the Government Survey, the monthly report of meteorological conditions at Honolulu is now made partly in accordance with the new form, No. 1040, and the arrangement of the columns, therefore, differs from those previously published.

Meteorological Observations at Honolulu, April, 1901.

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.

Date.	Pressure at sea level.	Temperature.		During twenty-four hours preceding 1 p. m. Greenwich time, or 2:30 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	30.07	74	67.5	82	67	66.5	73	e-sw.	1	3-8	30.11	29.97	0.04
2	30.04	73	65.5	81	73	64.7	69	ne.	4	5	30.10	30.00	0.01
3	30.02	72	65.7	79	70	64.3	72	n-nne.	3-1	5-10	30.10	29.99	0.04
4	30.07	72	65	79	70	62.3	66	ne.	4	3	30.09	30.00	0.00
5	30.08	72	65	78	70	61.7	65	ne.	5	3	30.13	30.04	0.00
6	30.03	73	65.5	78	71	62.3	67	ne.	4-2	5-10	30.13	30.04	0.03
7	30.02	66	64.7	80	71	65.0	75	ne-se.	3-0	5-10	30.08	29.99	0.24
8	29.97	64	63.3	79	64	64.5	77	s-w-ne.	0-1	8	30.04	29.91	0.01
9	29.97	66	65	80	63	65.3	82	se-n.	2-0	4-9	30.03	29.91	0.72
10	29.98	74	68	79	64	64.5	77	nne.	1	10	30.03	29.93	0.08
11	30.00	73	66.5	79	68	65.0	73	ene.	3	10-6	30.06	29.98	0.05
12	30.02	72	66.5	80	72	64.3	68	ne.	3-5	6-10	30.06	30.00	0.09
13	29.99	72	66.5	79	71	64.3	72	ne.	4	6	30.07	29.97	0.20
14	30.01	68	66	79	70	65.0	72	ne.	3	4	30.06	29.99	0.43
15	29.99	72	66	80	68	64.5	77	ne.	2	8-3	30.07	29.97	0.22
16	30.02	72	66	78	69	64.3	75	ne.	3	8-3	30.07	29.98	0.25
17	30.02	72	63.5	78	70	63.0	70	ne.	3-5	4	30.09	30.02	0.06
18	30.03	72	66	78	71	60.5	62	ne.	5	2	30.09	30.00	0.00
19	29.97	68	64	79	71	60.3	63	ne-nne.	4-2	3	30.08	29.98	0.01
20	29.99	66	64	80	63	63.0	73	ne.	2-0	3-0	30.04	29.94	0.00
21	29.96	63	61.7	79	65	63.3	77	sw-n.	1-0	4-8	30.03	29.95	0.03
22	29.87	65	63.7	80	62	62.5	76	sw.	0-2	7-1	29.96	29.88	0.00
23	29.84	66	64	80	63	63.5	76	sw-n.	0-1	1	29.89	29.80	0.00
24	29.92	71	65	82	64	64.0	73	sw-ne.	0-2	5	29.98	29.88	0.00
25	29.99	71	63.5	81	68	62.0	65	nne.	2	3	30.02	29.92	0.00
26	29.95	71	64	79	70	59.7	62	nne.	4-2	2	30.04	29.93	0.00
27	29.89	72	66.5	79	70	62.0	68	nne.	3	4	29.96	29.89	0.00
28	29.88	67	65	80	69	65.0	72	ene.	2	5-10	29.96	29.88	0.60
29	29.92	64	63.3	77	63	63.5	77	w-ne.	1	10	29.93	29.87	0.00
30	29.99	68	66.5	80	64	65.0	79	sw-n.	1-0	8	30.03	29.95	0.00
Sums	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3.11
Means	29.983	69.7	65.2	79.5	67.8	63.5	72.0	.....	2.3	5.4	30.045	29.958	.....
Departure	—.021	.....	.....	.....	.....	+0.2	+0.5	.....	.....	+0.3	.....	.....	+0.3

Mean temperature for April, 1901 (6 + 2 + 9) ÷ 3 = 73.0; normal is 72.8. Mean pressure for April, 1901 (9 + 3) ÷ 2 = 29.999; normal is 30.020.

*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.