

MONTHLY WEATHER REVIEW.

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INTRODUCTION.

The MONTHLY WEATHER REVIEW for July, 1903, is based on data from about 3300 stations, classified as follows:

Weather Bureau stations, regular, telegraph and mail, 160; West Indian Service, cable and mail, 8; River and Flood service, 52, river and rainfall, 177, rainfall only, 62; voluntary observers, domestic and foreign, 2565; total Weather Bureau Service, 2962; Canadian Meteorological Service, by telegraph and mail, 20, by mail only, 13; Meteorological Service of the Azores, by cable, 2; Meteorological Office, London, by cable, 8; Mexican Telegraph Company, by cable, 3; Army Post Hospital reports, 18; United States Life-Saving Service, 9; Southern Pacific Company, 96; Hawaiian Meteorological Service, 75; Jamaica Weather Service, 130; Costa Rican Meteorological Service, 25; The New Panama Canal Company, 5; Central Meteorological Observatory of Mexico, 20 station summaries, also printed daily bulletins and charts, based on simultaneous observations at about 40 stations; Mexican Federal Telegraph Service, printed daily charts, based on about 30 stations.

Special acknowledgment is made of the hearty cooperation of Prof. R. F. Stupart, Director of the Meteorological Service of the Dominion of Canada; Mr. Curtis J. Lyons, Territorial Meteorologist, Honolulu, H. I.; Señor Manuel E. Pastrana, Director of the Central Meteorological and Magnetic Observatory of Mexico; Camilo A. Gonzales, Director-General of Mexican Telegraphs; Capt. S. I. Kimball, Superintendent of the United States Life-Saving Service; Lieut. Commander W. H. H. Southerland, Hydrographer, United States Navy; H. Pittier, Director of the Physico-Geographic Institute, San José,

Costa Rica; Commandant Francisco S. Chaves, Director of the Meteorological Service of the Azores, Ponta Delgada, St. Michaels, Azores; W. M. Shaw, Esq., Secretary, Meteorological Office, London; Rev. Josef Algué, S. J., Director, Philippine Weather Service; and H. H. Cousins, Chemist, in charge of the Jamaica Weather Office.

Attention is called to the fact that the clocks and self-registers at regular Weather Bureau stations are all set to seventy-fifth meridian or eastern standard time, which is exactly five hours behind Greenwich time; as far as practicable, only this standard of time is used in the text of the REVIEW, since all Weather Bureau observations are required to be taken and recorded by it. The standards used by the public in the United States and Canada and by the voluntary observers are believed to conform generally to the modern international system of standard meridians, one hour apart, beginning with Greenwich. The Hawaiian standard meridian is $157^{\circ} 30'$, or $10^{\text{h}} 30^{\text{m}}$ west of Greenwich. The Costa Rican standard of time is that of San José, $0^{\text{h}} 36^{\text{m}} 13^{\text{s}}$ slower than seventy-fifth meridian time, corresponding to $5^{\text{h}} 36^{\text{m}}$ west of Greenwich. Records of miscellaneous phenomena that are reported occasionally in other standards of time by voluntary observers or newspaper correspondents are sometimes corrected to agree with the eastern standard; otherwise, the local standard is mentioned.

Barometric pressures, whether "station pressures" or "sea-level pressures," are now reduced to standard gravity, so that they express pressure in a standard system of absolute measures.

FORECASTS AND WARNINGS.

By Prof. E. B. GARRIOTT, in charge of Forecast Division.

The storms of the month on the North Atlantic were of moderate intensity and appeared over the ocean in high latitudes. In the vicinity of the Azores high barometric pressure prevailed except from the 14th to the 16th.

In the United States the only important general storm of the month visited the Lake region and middle Atlantic and New England coasts on the 17th and 18th. This storm, in advance of which the usual warnings were displayed, was severe in the lower Lake region and on the southern New England coast, and the high wind that attended its passage flattened corn in the Ohio Valley and the Lake region.

The warm waves of the month were neither severe nor of long duration. High temperatures that prevailed generally over the country on the 1st were broken in the Eastern States by local rains on the 2d. A warm wave that appeared in the Northwest on the 6th extended over the central valleys on the 7th and reached the Atlantic coast on the 8th. High temperatures continued over the interior and eastern districts until broken by local rains and thunderstorms on the 10th, 11th, and 12th. On the 23d and 24th high temperatures again appeared in the Northwest, and the warm wave extended over the upper Mississippi and lower Ohio valleys and the western Lake region during the 25th and reached the Atlantic coast on the 26th. The temperature continued high in the Middle West during the 27th and 28th and rose, on those dates, to 100° at Fresno, Cal.

The warm wave of the 6th to 12th culminated in the Middle Atlantic States with severe local storms. At Baltimore, Md., a tornadic storm that occurred about noon on the 12th unroofed or otherwise wrecked several hundred houses. The buildings wrecked were mostly frail brick structures. On the 22d, shortly after 3 p. m., Paterson, N. J., was visited by a tornado that caused the death of three persons and destroyed property, principally in the form of small houses, valued at about \$250,000.

In the early days of the month heavy rains resulted in floods in the streams of northern Texas, and on the 5th considerable damage was caused by rain in parts of Pennsylvania and western Maryland.

During the first decade of the month frost occurred at points in the middle and northern Plateau and northern Rocky Mountain districts, and on the 2d snow was reported on the Continental Divide in Montana. On the 26th and 27th frost occurred in parts of northern New England, and snow flurries were reported in the mountain regions of New Hampshire.

BOSTON FORECAST DISTRICT.

From the 1st till the 14th the weather was of the usual mid-summer type, with the temperature generally above normal. During the remainder of the month there was much cloudiness, with local storms, which in some localities were of marked