MONTHLY WEATHER REVIEW.

Editor: Prof. CLEVELAND ABBE.

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INTRODUCTION.

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

Weather Bureau stations, regular, telegraph and mail, 166; West Indian Service, cable and mail, 15; 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, and Mr. R. C. Lydecker, Acting 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. N. Shaw, Esq., Secretary, Meteorological Office, London; Rev. José Algué, S. J., Director, Philippine Weather Service; and H. H. Cousins, Chemist, in charge of the Jamaica Weather Office; Señor Enrique A. Del Monte, Director of the Meteorological Service of the Republic of Cuba.

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° 30′, or $10^h\ 30^m$ west of Greenwich. The Costa Rican standard of time is that of San José, $0^h\ 36^m\ 13^s$ slower than seventy-fifth meridian time, corresponding to $5^h\ 36^m$ 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.

During the first and second decades of the month prevailing low barometric pressure over the British Isles was attended by a succession of severe gales over the eastern Atlantic. During a greater part of the third decade there was a reversal of the usual barometric pressures over western Europe, the barometer being high over northwestern and low over southwestern European countries. This abnormal distribution of pressure produced unusually low temperatures over central and southwestern Europe. During the period of low pressure over the British Isles the barometer continued relatively high in the vicinity of the Azores, and several depressions that crossed the eastern part of the United States with a moderate show of energy increased in intensity as they advanced over the Atlantic in high latitudes.

In the United States the storms of the first two decades of December lacked seasonal intensity, a fact that may, perhaps, be attributed to the peculiar barometric conditions, referred to, that existed to the eastward. During the third decade, however, two storms of marked severity advanced from the westward across the New England coast. The principal storms of the month on the Great Lakes occurred on the 12th and 19–20th. The storms of the Gulf of Mexico and Pacific coast were not attended by gales of marked severity.

Ample and timely warning was given United States ports of the high winds of the month.

The first cold wave of December appeared over the British Northwest Territory on the 11th; extended over the central valleys on the 12th, carrying the line of zero temperature to southern Illinois and southern Indiana; covered the Ohio Valley and the Lake region on the 13th, with freezing temperature in the interior of the west Gulf States, and extended over the interior of New England during the 14th. A cold wave that appeared over Manitoba on the 24th extended southward and southeastward carrying the line of zero temperature nearly to the Ohio River by the morning of the 26th, and reached the middle and east Gulf and Atlantic coasts on the morning of the 27th, with freezing temperature as far south as Tampa, Fla. During the 29th and 30th a cold wave advanced from the eastern part of the British Northwest Territory over the Ohio Valley and the Lake region.

Frequent frosts were reported on the middle and east Gulf coasts, in central and northern Florida, and parts of California. Killing frost occurred at Mobile, Ala., on the 3d, at New Orleans, La., and Pensacola, Fla., on the 27th, and at Red Bluff, Cal., on the 7th. Heavy frost occurred as far south as Tampa, Fla., on the 4th, 7th, 22d, 28th, and 30th, at San Francisco, Cal., on the 9th, at Los Angeles, Cal., on the 22d, and at Fresno, Cal., on the 8th, 10th, 15th, 18th, 26th, 28th, and 30th.

Timely warnings were issued to all interests affected by cold waves and frosts.