

MONTHLY WEATHER REVIEW.

Editor: Prof. CLEVELAND ABBE.

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INTRODUCTION.

The MONTHLY WEATHER REVIEW for January, 1899, is based on about 2,762 reports from stations occupied by regular and voluntary observers, classified as follows: 162 from Weather Bureau stations; numerous special river stations; 32 from post surgeons, received through the Surgeon General, United States Army; 2,385 from voluntary observers; 96 received through the Southern Pacific Railway Company; 29 from Life-Saving stations, received through the Superintendent United States Life-Saving Service; 31 from Canadian stations; 10 from Mexican stations; 7 from Jamaica, W. I. International simultaneous observations are received from a few stations and used, together with trustworthy newspaper extracts and special reports.

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, Meteorologist to the Hawaiian Government Survey, Honolulu; Dr. Mariano Bárcena, Director of the Central Meteorological and Magnetic Observatory of Mexico; Mr. Maxwell Hall, Government Meteorologist, Kingston, Jamaica; Capt. S. I. Kim-

ball, Superintendent of the United States Life-Saving Service; and Commander J. E. Craig, Hydrographer, United States Navy.

The REVIEW is prepared under the general editorial supervision of Prof. Cleveland Abbe.

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. 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 meridian is mentioned.

FORECASTS AND WARNINGS.

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

The storms of January, 1899, presented no unusual features.

From the 1st to the 4th a disturbance crossed the northern districts from the Pacific to the St. Lawrence Valley, causing wind velocities of 50 miles an hour on the north Pacific coast the night of the 1st, and strong gales over the Lake region during the 4th. Following the passage of this storm a marked fall in temperature occurred in the lower Missouri and upper Mississippi valleys on the 4th, and by the morning of the 5th the temperature had fallen to zero in northern Iowa.

Two storms appeared over Texas or the Rio Grande Valley, one advancing from Texas to the St. Lawrence Valley from the 5th to the 7th, and the other from the Rio Grande Valley to the region north of the St. Lawrence during the 13th and 14th. The first of these storms caused heavy snow in the upper Ohio Valley and the lower Lake region on the 6th, and heavy gales the night of the 6th over the lower Lakes and along the north Atlantic coast. The Rio Grande Valley storm reached the lower Lake region the morning of the 14th, and during the day and night of that date caused high winds from the lower Lake region over the middle Atlantic and New England coasts.

The fourth storm of the month, which appeared on the 22d as a trough of low barometric pressure extending from Minnesota to Texas, drifted eastward over the Lake region during the 23d and reached the Atlantic coast on the 24th. During the night of the 24th this disturbance increased rapidly

in intensity and caused gales of 50 to 60 miles an hour along the north Atlantic coast, with a maximum velocity of 68 miles per hour at New York City, 56 at Cape Henry, and 48 at Woods Hole.

The final important storm of the month moved from the British Northwest Territory to the St. Lawrence Valley from the 24th to the 26th. While crossing the Lake Superior region this storm developed great strength and was attended during the day of the 26th by gales of 50 to 70 miles an hour over the Great Lakes. The night of the 26th correspondingly high wind velocities were registered along the north Atlantic coast. Following the passage of this disturbance the most important cold wave of the month overspread the upper Missouri Valley the night of the 27th. By the morning of the 28th the temperature was 22° to 26° below zero in North Dakota, and by the morning of the 29th the line of zero temperature was traced to southern Missouri and southern Kansas. During the last three days of the month a cold wave advanced from the northern Rocky Mountain region to the west Gulf and Middle Atlantic States, carrying zero temperatures to southern Kansas and freezing weather to west-central Texas on the 30th, and zero temperature to Oklahoma and northwestern Texas by the morning of the 31st.

Reports indicate that the warnings issued in connection with these storms and cold waves were of material value to shipping and transportation interests, and that in the truck-