

MISCELLANEOUS PHENOMENA.

DROUGHT.

Key West, Fla., 4th: but 0.88 inch of rain has fallen since the 27th of December last; all cisterns are extremely low and many completely empty; families living on the outskirts of the city are depending on supplies brought from the large Government cistern at Fort Taylor; water is carted around in the streets and sold. Quite a heavy rain fell on the 11th, breaking the drought and replenishing the water supply to a limited extent.

FOREST AND PRAIRIE FIRES.

Forest and prairie fires were reported as follows: Fort Sill, Ind. T., 2d to 17th, 20th to 30th; Tribune, Kans., 8th, 12th to 14th; Cedar Springs, S. C., 13th; Fort Reno, Indian T., 9th, 13th, 17th, 30th; Las Animas, Colo., 14th; Fort Bidwell, Cal., 29th; Pike's Peak, Colo., on the 31st, extensive prairie fires were observed to the southeastward of Colorado Springs.

HALOS.

Solar halos were recorded on every day during the month in some part of the country; they were least frequent on the 4th, 8th, 9th, 13th, 14th, and 26th; and most frequent on the 10th, 15th, 19th, 23d, and 24th; they were observed on from ten to fifteen dates in the following states, and territories: Dakota (maximum), Florida, Iowa, New York, Ohio, Texas, Washington, and Wisconsin.

Only a few lunar halos were recorded from the 1st to the 15th, and on the 30th, and 31st, but during the remainder of the month they were extensively observed, being most frequent on the 23d and 24th; none were reported on the 10th and 13th;

they were recorded on the largest number of dates in California and Oregon; in a number of states they were not reported at all.

METEORS.

Meteors were observed, as follows: 1st, Omaha, Nebr. 3d, Mount Vernon, Ala. 6th, Clear Lake, Iowa; Kalamazoo, Mich.; Beverly, N. J. 7th, Wauseon, Ohio; Corry, Pa. 8th, Kalamazoo, Mich., and Wauseon, Ohio. 10th, Clear Lake, Iowa; Tribune, Kans. 13th, Tribune, Kans. 14th, Clear Lake, Iowa. 15th, Auburn, Ala.; Vevay, Ind. 16th, Lead Hill, Ark.; Cedar Keys, Fla. 20th, Yuma, Ariz. 27th and 28th, Clear Lake, Iowa. 30th, Parkston, Dak. 31st, Wilson, Kans.

MIRAGE.

Moorhead, Minn.: villages, hills, timber, and lakes situated to the northeast, east, and southeast of station, and ordinarily not visible from this place, were distinctly seen at 3 p. m. on the 22d.

Fort Assinaboine, Mont.: the banks of Milk River, situated about ten miles northeast of this place, were plainly visible nearly all day on the 15th; objects appeared to be elevated about 5° to 6° above the surface of the ground.

Mirages occurred also, as follows: Webster, Dak., 5th; Cedar Hills, Tex., 8th; Marquette, Nebr., 12th to 14th; Tribune, Kans., 12th to 14th, 18th, 20th, 23d; Cedar Keys, Fla., 19th.

SAND STORMS.

Sand storms were reported, as follows: Fresno, Cal., 1st, 30th, 31st; Fort Mojave, Ariz., 7th, 17th, 18th; Yuma, Ariz., 8th; Willcox, Ariz., 8th, 10th, 11th; Pekin, Ill., 21st; Boise Barracks, Idaho, 31st.

VERIFICATIONS.

INDICATIONS FOR 33 HOURS IN ADVANCE.

The percentages of verifications of the tri-daily indications for March, 1888, as determined from comparison of succeeding telegraphic reports, are given in the table below.

The predictions for all districts east of the Rocky Mountains for March, 1888, were made by Prof. Cleveland Abbe, except those for Minnesota and Dakota, which were made at Saint Paul, Minn., by 1st Lieutenant Thomas M. Woodruff, 5th Infantry, U. S. Army, Acting Signal Officer; those for the Pacific coast districts were made at San Francisco, Cal., by 2d Lieutenant J. E. Maxfield, Signal Corps; the verifications for all districts were determined by Junior Professor C. F. Marvin.

Percentages of indications verified, March, 1888.

States.		States.	
Maine.....	72.55	Kentucky.....	77.42
New Hampshire.....	73.77	Ohio.....	71.77
Vermont.....	67.97	West Virginia.....	79.97
Massachusetts.....	71.55	Indiana.....	78.90
Rhode Island.....	73.84	Illinois.....	80.26
Connecticut.....	72.42	Lower Michigan.....	76.10
Eastern New York.....	71.90	Upper Michigan.....	72.42
Western New York.....	73.13	Wisconsin.....	73.68
Eastern Pennsylvania.....	74.48	Minnesota*.....	67.29
Western Pennsylvania.....	69.52	Iowa.....	74.68
New Jersey.....	77.10	Kansas.....	76.87
Delaware.....	73.61	Nebraska.....	75.94
Maryland.....	73.94	Missouri.....	80.52
District of Columbia.....	72.81	Colorado.....	76.48
Virginia.....	75.61	Eastern and Southwestern Dakota*	68.69
North Carolina.....	78.03	Southern California*	81.84
South Carolina.....	75.10	Northern California*	78.00
Georgia.....	73.00	Oregon*.....	77.55
Eastern Florida.....	76.68	Washington Territory*	73.74
Western Florida.....	72.23	By elements:	
Alabama.....	78.26	Weather.....	81.14
Mississippi.....	80.29	Wind.....	74.51
Louisiana.....	83.77	Temperature.....	68.50
Texas.....	75.16		
Arkansas.....	80.52	General average.....	75.42
Tennessee.....	78.26		

* In determining the general average percentage for the different elements, Minnesota, Dakota, and the Pacific coast states have not been included.

CAUTIONARY SIGNALS.

Of the total number of cautionary and storm signals ordered during March, 1888, it was practicable to determine the justification or failure of forty; justified, twenty-five, or 62.50 per cent. Of the above, thirty-eight were ordered for cautionary signals; number justified, twenty-four or 63.16 per cent. Two storm signals were ordered; justified, one or 50.00 per cent. Total number of direction signals ordered, forty-five; justified, thirty-nine, or 86.67 per cent. Number of signals ordered for easterly winds, thirty; justified, twenty-seven, or 90.00 per cent. Number of signals ordered for westerly winds, fifteen; justified, twelve, or 80.00 per cent.

Number of storms without signals forty-two. Number of signals ordered late, *i. e.*, after the justifying velocity had begun, five, or 12.50 per cent.

COLD-WAVE SIGNALS.

Total number of cold-wave signals ordered from Office Chief Signal Officer, two hundred and thirteen; justified, one hundred and fifteen, or 53.99 per cent. Ninety-eight cold-wave signals were ordered during the month by the Signal Service Officer at Saint Paul, Minn., of which, sixty, or 61.22 per cent., were justified.

LOCAL VERIFICATIONS.

The following extracts from the published reports of state weather services for March, 1888, show the percentages of verification of weather and temperature signals for the several states:

Michigan.—Weather and temperature signals are now displayed in one hundred and forty towns in the state, and on the baggage-cars of twenty-six trains on eight principal railroads of the state.

The indications and cold-warnings are issued by the Chief Signal Officer and distributed to the different stations through the central office. The indications are issued at 1 a. m., daily, from the Chief Signal Office, Washington, and are for the twenty-four hours from 7 a. m. to 7 a. m.

The percentage of verification of these indications for March is as follows