

IX.—TEMPERATURE OF WATER.

The table on map No. III shows the maximum and minimum temperatures of the water at the stations there given. In reference to this subject, the following general remarks may be made: The average temperature of the water has been within five degrees the same as that of the air, except for the lower Missouri, Lakes Superior, Huron and Champlain and the coast of Maine. The range of temperature has been—In the lower Missouri, 16 degrees; in the upper Mississippi, 21; in the Ohio and tributaries, 20; on the Eastern Gulf coast, 25; on the South Atlantic coast, 8; on the Middle Atlantic coast, 14; in the Lower Lakes, 20, and in the Upper Lakes, from 15 to 30 degrees.

The difference between the maximum water temperature and the maximum air temperature has been greatest in the northern sections of the country, where it has averaged 23 degrees. The average difference for the South Atlantic and Gulf coasts is 11 degrees. In general the minimum water temperatures are higher than those of the air, the only exceptions being at Duluth and Burlington, Vermont. The average difference of these minima decreases gradually from North Carolina, where it is 15, to Maine, where it is one degree. In the waters of the Mississippi and its tributaries this difference varies between 15 and 22 degrees. At Galveston the water has thence been warmer than the air.

X.—ELECTRICAL PHENOMENA.

(1.) *Thunder and Lightning*.—The month of June has been notable in certain sections of the country for the display of atmospheric electricity, the remarkable cases of which have naturally coincided with the dates of severe local storms as given in a preceding section. The first half of the month was in fact remarkable for an almost continuous series of displays of thunder and lightning throughout the West and Northwest. The maximum number of days on which thunder or lightning has been recorded as observed somewhere within the range of vision of the observer, has been 20 to 25 in the South Atlantic and Gulf States and Missouri. It has been observed on from 15 to 20 days in Iowa, Minnesota, Wisconsin, New York and Maine.

(2.) *Auroras*.—The auroral displays, recorded in June, have sometimes evidently stood in an intimate relation to the existing thunder and lightning storms. The auroral streamers of the 7th and 8th appeared brilliant at some few places, but the others were in general very faint. The dates on which they occurred are given in the following list:

1st, In Iowa; 2nd, in Vermont; 3rd, Iowa, Minnesota, New York and Maine; 4th, Wisconsin; 5th, Illinois and Iowa; 6th, Illinois and Maryland; 7th, Colorado, Nebraska, Wisconsin, Iowa, Michigan, Indiana, Illinois, Missouri, Ohio, Tennessee, New York, Virginia, Maryland and Vermont; 8th, Nebraska, Illinois, Ohio, Tennessee, New York, Pennsylvania and Maine; 9th, Vermont; 10th, Vermont; 12th, Wisconsin; 13th, Wisconsin, Vermont and Maine; 14th, Pennsylvania, New Jersey, Connecticut and Vermont; 15th, Connecticut; 17th, Michigan and Maryland; 18th, Pennsylvania; 21st, Vermont; 22nd, Vermont; 23rd, Vermont; 26th, Vermont and Ohio; 28th, Indiana; 30th, Ohio.