 1874

No. XI. The afternoon report of the 29th from the Northwest indicated the approach of this depression, but at no succeeding report could its center be more than approximately located; it passed to the north of the lakes, and was only attended by light local rains in the regions north of the Ohio valley

Local Storms.—These storms have been particularly marked for their severity during the past month. Their occurrence seems to depend upon the relative distribution of barometric pressure considered in relation to the topography of the country. The region of greatest frequency has been in the vicinity of the Appalachian chain, where the vapor from the Gulf and the Atlantic was forced over the ascending plains by the prevailing southerly and southwesterly winds. Those producing the greatest destruction of life and property occurred on the 4th, 7th, 24th and 26th of the month. On the afternoon of July 4, the depression already referred to as No 3, was central near the eastern portion of Lake Erie; at midnight this depression was located near the eastern boundary of New York, south of its previous position. The sudden veering of the winds in the south and west quadrants of this area was attended by violent storms during the afternoon and evening in the States of Maryland, Virginia, Delaware, New Jersey and Pennsylvania. From an examination of a large number of reports referring to these storms, it is shown that the regions of severity were limited in area, and that the storms uniformly approached from the northwest. The storm of the 24th occurred at Eureka, Nevada, and was very destructive; but no official report has been received concerning it.

The remarks referring to the area of low barometer, marked No. X, considered in connection with the peculiar arrangement of clouds at Erie, Pennsylvania, during the evening of the 26th, which was as follows:—"Three distinct strata of clouds: *First*, black cumulo-stratus moving from the southwest; *Second*, heavy cumulus well defined, moving from a little north of west; *Third*, cirro-cumulus moving from the north," give the general atmospheric conditions which attended the unusually heavy rains occurring in western Pennsylvania on that date. The official report from the Observer at Pittsburgh, states that the total number of lives lost at or near that city is one hundred and thirty-four, and that property valued at five hundred thousand dollars was destroyed.

PRECIPITATION.

In the construction of Chart No. 3, which is a graphical representation of the distribution of rain in the United States, the regular and volunteer reports have been combined with those furnished by Professor Kingston, of the Toronto Observatory. From the comparative tables accompanying the chart, it will be observed that the districts showing an excess over the normal are near the coast, and that the regions of excess of rain correspond with those in which the mean temperature has been below the normal. Within the large area representing less than two inches of rain, there are small districts where there has been a total absence of it. Special droughts have prevailed, proving injurious to crops, in Kentucky, Arkansas, Texas, Missouri and Kansas.

Cloudy Days.—The number of cloudy days reported from the Signal Service Stations average as follows: Six on the Gulf coast, eight on the South Atlantic coast, seven on the Middle Atlantic coast, twelve on the East Atlantic coast, three in the Lower Mississippi valley, six in the Ohio valley, seven in the Upper Mississippi valley, four in the Lower Missouri valley, and six in the Lake region.

Rainy Days.—The number of days on which rain fell are as follows: Eleven in the Gulf States, fifteen in the South Atlantic States, eleven in New England, eleven in the

Lower Lake region, nine in the Upper Lake region, eight in the Upper Mississippi valley, seven in the Lower Mississippi valley, and twelve over the Blue Ridge and Alleghanies.

Special Rains.—Remarkably heavy rains occurred on the 3d at Wilmington, Charleston and Savannah; on the 4th at New Orleans and Mobile; on the 12th at Hinsdale, Mass.; on the 24th at Eureka, Nevada; on the 26th at Pittsburgh and Allegheny City, Penn., and at Port Huron, Michigan; on the 27th at Rising Sun, Indiana.

HUMIDITY.

During the month of July the relative humidity has averaged as follows in the different sections of the country:

On the Gulf and South and East Atlantic States, .75; on the New Jersey coast, .85; in the Lake region. .68; in the Lower Mississippi valley, .70; in Tennessee and the Ohio and Upper Mississippi valley, .62; in the Lower Missouri valley, .58; at the Rocky Mountain stations, .41.

ATMOSPHERIC TEMPERATURE.

The mean isothermal lines for the month are represented on Chart No. II, and the comparison of the mean temperature of the several districts with that of the mean temperature of July in previous years is given in the table. It will be seen that the temperature has been above the mean in the districts of the Mississippi valley and below it in the districts near the coast; this has been particularly noticeable on the Middle Atlantic and New England coasts and at San Francisco. The range of temperature compared to that of 1873 has diminished slightly on the Gulf coast and increased in the northern sections of the country. The unusual high temperature of 100° prevailed over an extensive region, including Indian Territory, Missouri, Kansas, Nebraska and portions of Iowa and Arkansas on the 25th of the month. The mean temperature at the summit of Pike's Peak was 42°, that at the summit of Mount Washington, 48°.5.

Frosts were reported on the 10th in Colorado, and on the 27th in Minnesota.

TEMPERATURE OF WATER.

The table on Chart No. III gives the maximum and minimum temperature of water by observations made at the bottom at many of the Signal Service stations on lakes, rivers and coasts. The range of temperature of the water on the Atlantic seaboard has been about five degrees and on the Gulf coast seven degrees. In Lake Erie the range varies from five degrees at Buffalo to fourteen degree at Cleveland. In Lake Michigan from nine degrees at Chicago to nineteen degrees at Milwaukee, and in Lake Superior from fourteen degrees at Marquette to twenty-one degrees at Duluth. The range averages about fourteen degrees in the Ohio, nine degrees in the Upper Mississippi and four degrees in the Lower Missouri.

The difference between the maximum air temperature and maximum water temperature has been greatest on the coast of Maine and near Lake Superior, where it has averaged thirty degrees; this difference has been least in the Gulf and on the South Atlantic coast, where it has averaged nine degrees. At the stations on the western rivers the temperature of the air has risen from twelve to twenty-five degrees above the highest water temperature.

The minimum air temperature has been lower than the minimum water temperature at nearly all stations, the only exception being at Duluth, where the water temperature