Desoto, 27th and 31st. *New Hampshire:* Mt. Washington, 12th. *New Jersey:* South Orange, 11th; Sommerville, 25th, one-third of an inch in diameter. *North Carolina:* Highlands, 17th. *Ohio:* Bethel, Jacksonburg and Norwalk, 11th. *Pennsylvania:* Hulmville, 25th. *Wyoming:* Cheyenne, 26th.

Snow.—Colorado: Summit, 1st to 3rd, one inch. *Nevada:* Winnemucca, 29th, on neighboring mountains. *Utah:* Salt Lake City, in the mountains near, on the 30th. *Wash. Ter.:* Pomeroy, 29th, on hill near town.

Floods.—Ellsworth, N. C., exceedingly heavy rains from 1st to 6th, caused washouts on mountain division of N. C. R. R. North Platte, 26th, very heavy rains caused washouts on the U. P. R. R., delaying trains for two days. 14th, extremely heavy rains rendered all streams between San Antonio, Tex., and the Rio Grande river impassable; at Fort McKavett water rose 10 feet in 10 minutes at 4 p. m. of the 14th. On the 17th, Pecos river, Texas, impassable: bridge at Horsehead crossing swept away. At Castroville, Texas, on the 8th, river rose and became impassable in 15 minutes. Pittsburgh, 19th, violent thunder-storm; rain flooded part of Alleghany City. Colorado Springs, Colorado, 25th, heavy rain; washouts reported on D. & R. G. R. R. Rochester, 19th, very heavy rain, bursting sewers and flooding many streets. Richmond, Va., August 30th, violent thunder-storm with heavy rain, flooding the entire lower part of city, doing much damage. 21st, heavy rains of "past few days" in southern Colorado caused many washouts on different railways. Track of South Park Railway badly damaged between Thompson and Pine Grove. Bad washout on D. & R. G. R. R., on the 20th near the Divide. On the 20th Kansas Pacific trains delayed by bad washouts. Pomeroy, Wash. Ter., 29th, 2:45 p. m., a small cloud burst near town, flooding some houses.

Droughts.—Waveland, Ind., to August 23rd, very severe. Creswell, Kan., severe to 18th. Auburn, N. H., 31st, severe, "vegetation suffering badly, streams drying up;" Winnemucca, Nev. 17th, the "Sink" of the Humboldt completely dry, said to be the first time within the memory of man. Des Moines, 15th, "crops suffering." Wellington, Kan., 27th. Carrollton, Ill., and Independence, Mo., to August 20th, corn and other crops severely damaged. The *Missouri Weather Review* states that the entire State suffered from drought till the 20th.

Rainfall during July, received too late to be used in July Review.—Arizona, Camp Thomas, 0.87 inch; Ft. Lowell, 1.88; Ft. Verde, 1.59. *California*, Angel Island, Presidio, S. F., and Ft. Gaston, none; Summit, 0.80; Ft. Bidwell, 0.72; Salinas, 0.05. *Colorado*, Ft. Lyon, 3.09. *Dakota*, Ft. Stevenson, 0.89; Ft. Sisseton, 5.08; Ft. Sully, 1.93; Ft. Totten, 2.94. *Idaho*, Lewiston, 1.86; Ft. Lapwai, 1.78. *Kansas*, Dodge City, 4.00. *Montana*, Ft. Benton, 1.50; Ft. Shaw, 0.80; Ft. Ellis, 1.16; Ft. Keogh, 1.03; Ft. Logan, 0.93; Ft. Assiniboine, 1.72; Ft. Shaw, 1.51. *Nevada*, Toano, 0.06; Blue Creek, 1.09. *Oregon*, Ft. Stevens, 2.07; Ft. Klamath, 0.20. *Texas*, Ft. Ringgold, 0.73; Ft. Davis, 10.62. *Utah*, Corinne, 0.67. *Washington Ty.*, Dayton, 1.68; Ft. Canby, 1.48; Ft. Townsend, 1.42; Olympia, 0.52.

RELATIVE HUMIDITY.

The percentage of mean relative humidity for the month ranges as follows: New England, from 63 to 83; Middle Atlantic States, 63 to 89; South Atlantic States, 71 to 82; Eastern Gulf States, 69 to 78; Western Gulf States, 61 to 79; Ohio valley and Tennessee, 63 to 78; Lower Lake region, 65 to 77; Upper Lake region, 71 to 78; Upper Mississippi valley, 60 to 70; Missouri valley, 60 to 65; Red River of the North valley, 73 to 76; Texas, 60 to 79; Middle Plateau, 16 to 25; California, 32 to 82; Oregon, 44 to 69. *High stations* report the following averages not corrected for altitude: Pike's Peak, 73.6; Mt. Washington, 80.3; Virginia City, 36.9; Denver, 47.2; Santa Fe, 49.2.

WINDS.

The *prevailing directions of the wind* during August 1880, are shown by arrows, flying with the wind, on chart No. II. From the Mississippi valley westward to the Pacific ocean the predominating winds have been *southerly*, except in the northern half of the Pacific coast region, where they were *northerly*. In New England, the Lower Lake region, the Middle Atlantic States and the Ohio valley, they have been *southwesterly*, except at a few scattered stations. In the South Atlantic States and Tennessee, they were variable, with the *easterly* points predominating. At most stations in the Upper Lake region the prevailing winds were *northerly*. On Mt. Washington the prevailing wind was NW. and the maximum velocity NW. 60, on the 2nd; maximum velocities of 50 miles or more occurred as follows: 10th, 20th, 23rd, 25th, 28th and 29th, NW. 50; 24th, W. 52. On Pike's Peak, the total movement was 8,445, prevailing direction SW., maximum velocity 64 SW. Maximum velocities exceeding 50 miles were reported as follows: Indianola, 64 NE. 13th; Cedar Keys, 64 NE. on the 30th; Yankton, 56 SW. on the 16th and Kittyhawk on the 12th; Punta Rassa, 56 SW. on the 29th, and 56 (72 miles for 5 minutes) S. on the 30th; Brownsville, Tex., 48 miles on the 12th, when anemometer was blown down; exact maximum unknown.

Total Movements of the Air.—The following are the *largest* total movements in the various districts: Mt. Washington (summit of), 18,692 miles; North Platte, 11,167; Cape Lookout, 11,104; Chincoteague, Va., 10,238; San Francisco, 8,855; Indianola, 8,591; Pikes Peak (summit of), 8,445;

Sandy Hook, 8,216; Punta Rassa, 8,117; Milwaukee, 8,064; Sandusky, 8,010; Wood's Holl, 7,953. The *smallest* are: La Mesilla, 1,138; Lynchburg, 1,523; Red Bluff, 1,777; Augusta, 1,966; Des Moines, 2,219; Mobile, 2,305; Olympia, 2,378; Morgantown, 2,653.

Local Storms.—West Randolph, Vt., on the 12th, violent hail-storm, with wind and heavy rain, width, 1½ miles; stones as big as butternuts; over 2,000 lights of glass destroyed. Versailles, Ohio, on the 12th, very destructive hail-storm, seriously injuring tobacco and other crops. 18th, violent tornado, 14 miles SW. of Fargo, Dak.; track two miles wide, extending across the southern part of Cass county; one man killed, three severely injured, many houses blown down. August 24th, violent local storm one mile wide and seven miles long, swept over Great Neck, Little Neck and Creedmoor, Long Island, damaging many buildings and injuring crops. In addition to the damage done by the cyclone at and near Brownsville, 12th and 13th, the following are reported: San Diego, Tex., many buildings unroofed; at Collins and Banquete, railway bridges damaged; Goliad, Tex., great damage to buildings. Ft. Mojave, Ariz., 22nd, most violent storm, barracks blown down, four men killed and five wounded.

Waterspouts.—Near Hat Creek, Wy., on the 29th, 2 p. m., moved from N. to S. for ten minutes in a zig-zag course. Red Canon, Dak., during night of 28th, destroying telegraph line for eleven miles.

Sand-storms.—Tuscon, Ariz., 3rd; Florence, Ariz., 9th; Winnemucca, Nev., 4th, 10th, 23rd, 28th.

VERIFICATIONS.

Indications.—The detailed comparison of the tri-daily indications for August, with the telegraphic reports for the succeeding twenty-four hours, shows the general percentage of verifications to be 84.8 per cent. The percentages for the four elements are: Weather, 91.0; Direction of the Wind, 78.1; Temperature, 86.8; Barometer, 82.7 per cent. By geographical districts they are: for New England, 86.0; Middle States, 86.7; South Atlantic States, 99.4; Eastern Gulf States, 84.9; Western Gulf States, 89.2; Lower Lake region, 87.1; Upper Lake region, 84.6; Tennessee and the Ohio valley, 85.0; Upper Mississippi valley, 77.4; Lower Missouri valley, 76.0; Northern Pacific coast region, 87.5; Central Pacific coast region, 100.0; Southern Pacific coast region, 94.6. There were 35 omissions to predict out of 3,813, or 0.92 per cent. Of the 3,778 predictions that have been made, 144, or 3.81 per cent. are considered to have entirely failed; 117, or 3.10 per cent. were one-fourth verified; 449, or 11.88 per cent. were one-half verified; 469, or 12.42 per cent. were three-fourths verified; 2,599, or 68.79 per cent., were fully verified, so far as can be ascertained from the tri-daily reports.

Cautionary Signals—115 Cautionary Signals were displayed during the month, of which 87, or 75.7 per cent., were justified by winds of 25 miles per hour or over at, or within a radius of 100 miles of, the station. 9 Off-shore Signals were displayed, of which 6 or 66.7 per cent, were fully justified, and 9 or 100 per cent. justified as to direction. Three of the Off-Shore were changed from Cautionary. 124 Signals of both kinds were displayed, of which 93 or 75 per cent, were fully justified. 64 cases of winds of 25 miles and over per hour, from scattered stations, were reported, for which signals had not been ordered. The above does not include signals ordered for 49 display stations, where the velocity is only estimated.

NAVIGATION.

In the table on the right-hand side of chart No. III are given the highest and lowest stages of water, as recorded on the Signal Service river gauges, during August, 1880. The rivers have continued *low* throughout the month, and, except the Ohio and its tributaries, have gradually fallen. The highest waters in the Ohio, Tennessee and Monongahela occurred between the 21st and 28th.

High Tides.—Kittyhawk, 25th, 26th and 27th, unusually high tides, tremendous swell from the east. Galveston, 12th and 13th, very high.

Low Tides.—Cedar Keys, 29th.

TEMPERATURE OF WATER.

The temperature of water, as observed in rivers and harbors at Signal Service Stations, with the average depth at which observations were taken, is given in the table on the left hand side of chart No. II. At the following stations observations were not made on the dates indicated: Cleveland, 23rd to 29th, inclusive; Detroit, 4th to 10th; Key West, 15th to 31st; Milwaukee, 2nd to 11th; New London, 1st to 8th; Norfolk, 14th to 20th; Wilmington, 3rd to 8th; San Francisco, on the 1st.

The following were received too late to appear in the table. Punta Rassa, maximum, 89°; minimum, 78°; average depth, 13 feet. Cedar Keys, 87°, 74° and 14 feet.

ATMOSPHERIC ELECTRICITY.

Thunder-storms have been reported in too great numbers to permit their enumeration in detail, they have occurred, with greatest frequency, as follows: *Georgia:* 23rd to 25th. *Illinois:* on 23rd, 27th and 31st. *Indiana:* on 2nd, 10th, 20th, 28th to 30th. *Iowa:* 1st, 16th, 17th, 19th, 23rd, 26th and 27th. *Kansas:* 1st, 2nd, 4th, 20th, 24th, 25th, 27th to 31st. *Louisiana:* 8th and 13th. *Maine:* 21st. *Maryland:* 25th and 29th. *Massachusetts:* 12th, 21st, 25th and 29th. *Michigan:* 1st, 9th,