

to have fallen that measured from five to eight inches in circumference. In localities to the southwest and west of Milwaukee, the storm is reported to have been very destructive.

Rochester, New York: a thunder-storm, accompanied by heavy rain, prevailed from 7.30 to 8.10 p. m. on the 7th, and in the southern part of the city there was a slight fall of hail. Reports from the northern part of Wayne county state that a destructive hail storm occurred there and caused much damage to fruit, the trees being completely stripped of their foliage. The storm passed over Oneida lake into the Mohawk valley, where it is reported to have assumed the character of a tornado. At Utica, Trenton, Holland Patent, and Canajoharie, great damage was done. To the north of Rome the crops were badly damaged by hail, and many buildings were blown down. Buildings were also destroyed at Lasallesville and Oppenheim, in Fulton county.

Port Hope, Province of Ontario: a very severe hail storm occurred on the night of the 7-8th, during which all exposed window-glass was broken. The hail-stones were as large as walnuts, and some were found to measure five inches in circumference. Several barns in this vicinity were blown down or unroofed.

Huron, Dakota: a heavy hail storm is reported to have occurred to the north and northeast of this station during the evening of the 12th; crops were seriously damaged. On the 14th a severe storm passed through the southern part of this (Beadle) county into Sanborn county; it was accompanied by hail which proved destructive to crops. On the 27th a heavy hail storm occurred twenty miles north of this place, destroying crops and causing other damage.

Sherlock, Finney county, Kansas: a destructive hail storm occurred at this place on the 16th. The hail-stones varied from one inch in diameter to the size of hens' eggs; much damage was done to the growing crops.

Fort Yates, Dakota: the hail storm of the 18th caused slight damage to crops in this vicinity; the hail-stones were from one-fourth to one-half inch in diameter and covered the ground to a depth of one inch.

Stockham, Hamilton county, Nebraska: the hail storm of the 19th completely destroyed garden vegetables and caused great damage to crops. The storm was accompanied by high wind which unroofed, or blew down, numerous out-buildings.

Leavenworth, Kansas: a violent thunder-storm prevailed during the night of the 21-22d, accompanied by heavy rain and high wind, the latter reaching a velocity of 32 miles per hour. No damage was done in this city, but at points eight miles south of here considerable damage was done by hail.

Hail storms of less severity are reported to have occurred in the various states and territories as follows:

- Arizona*.—Fort Grant, 23d; Fort Apache, 27th.
- Arkansas*.—Lead Hill, 15th.
- California*.—Blue Lake, 5th.
- Colorado*.—Braddock, 5th, 12th, 15th, 28th; Pueblo, 17th, 23d; Pike's Peak, 27th, 28th.
- Dakota*.—Huron and Fort Sully, 5th; Fort Bennett, 5th, 11th, 14th, 26th, 27th; Deadwood, 11th, 18th, 20th, 25th; Fort Meade, 11th, 25th; Vermillion, 12th, 25th; Webster, and Bismarek, 18th; Fort Yates, 20th; Fort Totten, 25th.
- District of Columbia*.—Washington, 5th.
- Idaho*.—Albion, 7th; Cœur d'Alene, 12th; Boise City, 19th.
- Illinois*.—Sycamore, 7th, 27th; Mattoon, 15th; Swanwick, 20th.
- Indiana*.—Indianapolis and Logansport, 4th; Jeffersonville, 8th.
- Indian Territory*.—Fort Sill, 17th.
- Iowa*.—Keokuk, Fort Madison, and Independence, 2d; Ottumwa, 2d, 12th; Logan, 5th; Des Moines, 6th; Cresco, 7th, 12th; West Union, 12th; Guttenberg, 14th, 27th.
- Kansas*.—Allison, 1st, 16th; Wyandotte, 3d, 7th, 13th; Independence, 8th; Maud, 10th; West Leavenworth, 12th; Salina, 15th, 19th; Manhattan, 26th.
- Kentucky*.—Louisville, 8th.

- Maine*.—Portland and Cornish, 1st.
- Maryland*.—Baltimore, 5th.
- Michigan*.—Marquette, 14th; Thornville, 26th.
- Minnesota*.—Chester, 7th, 20th, 25th; Moorhead, 11th, 16th; Saint Vincent, 20th.
- Missouri*.—Conception, 7th.
- Montana*.—Poplar river, 2d, 29th; Fort Maginnis, 19th.
- Nebraska*.—Stockham, 4th, 5th; Fort Robinson, 5th, 11th; North Platte, 5th, 28th; Omaha, 7th, 13th, 14th; De Soto and Genoa, 12th, 14th; Columbus, 12th, 13th, 14th; Yutan, 15th.
- Nevada*.—Fort McDermitt, 5th, 9th; Winnemucca, 9th, 12th, 13th, 21st, 23d.
- New Hampshire*.—Mount Washington, 1st.
- New Jersey*.—Cape May, 5th; Readington, 8th; Little Egg Harbor, 22d.
- New Mexico*.—Lava, 27th.
- New York*.—Penn Yan, 7th; Palermo, 8th; Menand Station (near Albany), 9th.
- Ohio*.—Waseon, 4th; Yellow Springs, 15th.
- Oregon*.—Albany, 5th.
- Pennsylvania*.—Pittsburg, 4th; Wellsborough, 7th.
- Texas*.—Fort Stockton, 10th; Fort Davis, 16th.
- Utah*.—Nephi, 5th; Salt Lake City, 11th; Frisco, 22d.
- Virginia*.—Marion and Bruntington, 5th; Dale Enterprise, 21st.
- Washington Territory*.—Fort Townsend, 11th.
- Wisconsin*.—Prairie du Chien, 7th.

TEMPERATURE OF WATER.

The following table shows the highest and lowest temperatures of water observed at the several stations; the monthly ranges of water temperature; the average depth at which the observations were made; and the mean temperature of the air:

Temperature of water for June, 1885.

Station.	Temperature at bottom.		Range.	Average depth, feet and tenths.	Mean temperature of the air at station.
	Max.	Min.			
Atlantic City, New Jersey	66.9	62.0	7.9	4 8	66.7
Alpena, Michigan	66.8	60.2	6.6	12 5	58.3
Augusta, Georgia	81.3	71.6	9.7	7 7	77.8
Baltimore, Maryland	75.7	65.9	9.8	10 1	72.6
Black Island, Rhode Island	60.2	52.3	7.9	7 5	62.7
Boston, Massachusetts	60.4	45.7	14.7	19 8	66.4
Buffalo, New York	68.0	55.2	12.8	10 2	60.9
Canby, Fort, Washington Territory	64.7	50.6	8.1	14 7	55.8
Cedar Keys, Florida	88.9	81.2	7.7	8 3	81.4
Charleston, South Carolina	83.9	78.0	5.9	41 2	79.5
Chicago, Illinois	65.1	55.3	9.8	8 0	65.4
Chincoteague, Virginia	80.0	68.3	11.7	2 9	69.4
Cleveland, Ohio	73.6	57.1	16.5	14 0	64.5
Detroit, Michigan .....	.....	.....	.....	.....	.....
Duluth, Minnesota	57.9	46.7	11.2	10 0	57.3
Eastport, Maine	44.4	39.4	5.0	14 9	39.1
Esconaba, Michigan	64.0	49.0	15.0	18 7	59.4
Galveston, Texas	86.0	82.0	4.0	12 7	84.1
Grand Haven, Michigan	77.9	64.2	11.7	19 0	59.8
Indianola, Texas	86.6	80.9	5.7	9 0	82.2
Jacksonville, Florida	85.0	82.0	3.0	18 0	80.1
Key West, Florida	89.8	79.1	10.7	17 2	82.6
Mackinaw City, Michigan	59.1	47.3	11.8	10 0	56.8
Macon, Fort, North Carolina	83.0	70.2	12.8	5 0	74.4
Marquette, Michigan .....	.....	.....	.....	.....	.....
Milwaukee, Wisconsin	59.0	50.1	8.9	8 0	60.2
Mobile, Alabama	85.0	77.4	7.6	17 1	77.8
New Haven, Connecticut	70.8	59.9	13.9	16 6	65.2
New London, Connecticut .....	.....	.....	.....	.....	.....
New York City	68.7	61.0	7.7	13 0	67.3
Norfolk, Virginia	78.7	71.9	6.8	10 1	74.3
Pensacola, Florida	84.9	79.5	5.4	17 4	80.5
Portland, Maine	54.9	50.8	4.1	16 3	55.3
Portland, Oregon	69.7	59.1	10.6	63 7	61.0
Sandusky, Ohio	75.0	66.5	8.5	11 5	67.0
Sandy Hook, New Jersey	64.9	60.5	4.4	2 0	67.1
San Francisco, California	61.2	56.2	5.0	35 6	59.9
Savannah, Georgia	84.3	76.8	7.5	9 9	79.5
Smithville, North Carolina	83.0	71.8	11.2	10 5	76.4
Toledo, Ohio	75.9	65.7	10.2	13 3	68.3
Wilmington, North Carolina	81.6	75.3	6.3	14 3	76.4

* Record for 15 days.

† Thermometer broken.

COTTON REGION REPORTS.

In the following table are given the means of the maximum

and minimum temperatures, and average rainfall for the several cotton districts, for the month of June; the means for the same districts for June of the three preceding years are also given. A comparison of these figures shows a deficiency in the rainfall in all districts, except those of Charleston and Memphis. The means of the maximum and minimum temperatures are higher in nearly all of the districts but the departures in most of them are slight. The reports for the district of Galveston are missing.

Temperature and rainfall data for the cotton districts, June, 1885.

Districts.	Rainfall.			Temperature.						Extremes for June, 1885.	
	Average for June of three preceding years.	Average for June, 1885.	Departures.	Maximum.			Minimum.			Max.	Min.
				Mean for June of three preceding years.	Mean for June, 1885.	Departures.	Mean for June of three preceding years.	Mean for June, 1885.	Departures.		
New Orleans...	5.09	3.01	- 2.01	90.1	92.9	+ 2.8	70.8	66.4	- 4.4	105	50
Savannah.....	5.33	4.15	- 1.18	88.9	91.2	+ 2.3	68.9	70.3	+ 1.4	103	55
Charleston.....	5.35	6.60	+ 1.25	88.4	88.7	+ 0.3	67.1	67.3	+ 0.2	99	55
Atlanta.....	5.00	3.90	- 1.10	86.6	89.3	+ 2.7	65.4	66.7	+ 1.3	101	51
Wilmington.....	4.10	4.87	+ 0.77	87.7	87.0	- 0.7	65.1	64.3	- 0.8	97	41
Memphis.....	4.24	4.70	+ 0.46	87.6	89.2	+ 1.6	65.5	67.6	+ 2.1	102	42
Galveston.....	2.58			92.2			70.5				
Vicksburg.....	4.47	2.38	- 2.09	89.9	92.3	+ 2.4	68.3	68.5	+ 0.2	102	45
Montgomery.....	3.22	3.47	+ 0.25	88.7	91.7	+ 3.0	67.6	69.2	+ 1.6	102	47
Augusta.....	3.22	3.47	+ 0.25	88.7	90.3	+ 1.6	66.7	67.0	+ 0.3	103	50
Little Rock.....	2.78	2.71	- 0.07	89.6	90.1	+ 0.5	65.7	66.3	+ 0.6	103	54
Mobile.....	4.48	2.59	- 1.89	91.7	92.1	+ 0.4	68.3	74.7	+ 6.4	103	56

WINDS.

The most frequent directions of the wind during June, 1885, are shown on chart ii. by arrows flying with the wind. In the lower lake region, Tennessee, and the upper Ohio valley, the prevailing winds were from southwest and west; in the upper Missouri valley, northern and middle slopes, they were easterly and southeasterly; in the middle Atlantic and Gulf states, upper Mississippi, and the lower portions of the Ohio and Missouri valleys, they were southerly; on the California coast they were westerly, except at Cape Mendocino, where the prevailing direction was north; in other districts they were variable.

HIGH WINDS.

(In miles per hour.)

During the month of June velocities of fifty or more miles per hour were recorded at stations as follows:

On the summit of Mount Washington, New Hampshire, 78, nw., 1st; 63, nw., 2d; 69, nw., 6th; 60, w., 7th; 73, w., 8th; 85, nw., 9th; 69, w., 10th; 60, w., 13th; 100, w., 14th; 98, nw., 15th; 52, w., 16th; 67, nw., 17th; 67, nw., 18th; 50, s., 21st; 79, nw., 22d; 78, nw., 23d; 87, nw., 24th.

Pike's Peak, Colorado, 52, w., 4th; 62, sw., 5th; 78, w., 6th; 56, sw., 11th; 54, s., 13th; 60, w., 20th; 52, se., 21st.

- Montrose, Colorado, 50, sw., 5th.
- Fort Buford, Dakota, 56, ne., 6-7th.
- Dodge City, Kansas, 52, se., 5th.
- Fort Custer, Montana, 55, w., 6th.
- Fort Maginnis, Montana, 54, n., 6th.
- Fort Concho, Texas, 52, e., 30th.
- Cheyenne, Wyoming, 50, s., 5th.

LOCAL STORMS AND TORNADOES.

Chicago, Illinois, 2d: between 5 and 6 p. m. a thunder-storm, accompanied by heavy rain, prevailed in this city and vicinity. Many buildings were struck by lightning during the storm. Another violent thunder-storm, with heavy rain, prevailed during the night of the 2-3d. Five persons are reported to have been killed by lightning.

Atchison, Kansas: a violent storm occurred at this place on the 3d. The rainfall was remarkably heavy and resulted in the overflow of all streams in this vicinity. The damage to property is estimated at \$60,000.

Paris, Edgar county, Illinois: a very violent storm occurred

here at about 7 p. m. on the 4th. Numerous buildings were unroofed, and large numbers of trees and telegraph poles were prostrated. A church was almost entirely demolished.

Olivet, Eaton county, Michigan: a very severe storm, lasting about one hour, began at about 6 p. m. on the 4th. The high wind and very heavy rainfall (about four inches) caused much damage to crops; cellars were flooded and fencing scattered.

Oil City, Pennsylvania: during the night of the 4-5th the heaviest rains experienced for many years fell in this vicinity. The track of the Lake Shore railroad was washed away in several places between this place and Stoneborough; on the Allegheny Valley railroad there were four washouts between Oil City and Franklin.

Pierre, Hughes county, Dakota: a storm of unusual severity occurred at this place at about 5 p. m. on the 5th. It was accompanied by hail and very heavy rain, the latter causing much damage by flooding cellars, while many windows were broken by the hail. At Forest City, Potter county, the storm was also very severe, the hail and heavy rain causing much damage.

Fort Bennett, Dakota: on the 5th a high wind set in at 3.45 p. m., and continued with increasing force until 10.38 p. m. The maximum hourly velocity of the wind, 44 miles, west, occurred about 8 p. m., but at 10.30, a sudden squall occurred, during which, for two or three minutes, the wind blew at the rate of 72 miles per hour. This squall blew down nearly all of the out-buildings and fencing at the post and Indian agency. The rainfall during the storm amounted to 1.58 inches, which is an unusually large amount for this place. The Missouri river rose six feet during the night of the 5-6th, and small streams in the vicinity overflowed.

Baltimore, Maryland: during the afternoon of the 5th a severe storm, lasting about twenty minutes, prevailed in this city. It began at about 2.45 p. m., and was confined to an area less than one mile in width and about five miles in length through the northeastern part of the city. In the central part of the city but slight damage was caused, but in the northern and eastern sections many buildings were unroofed or otherwise damaged. At Highlandtown, five miles east of the city, many dwellings were wrecked and one man was killed.

Chincoteague, Virginia: during the afternoon of the 5th a thunder-storm occurred at this place, and at 5.30 p. m. (after the thunder-storm) the wind suddenly increased from a velocity of twelve to forty miles per hour, and continued at that rate for fifteen minutes.

Richmond, Virginia: a severe storm passed over this city on the afternoon of the 5th. A number of houses were unroofed and trees were blown down. Reports from Petersburg state that the storm was unusually severe at that place and resulted in considerable damage.

Owatonna, Steele county, Minnesota: a severe wind and hail storm passed over this place on the 7th. The hail-stones, which were about the size of hens' eggs, fell in sufficient quantity to cover the ground. Trees and crops were badly damaged, and nearly all the sky-lights in the town were broken. The storm lasted about half an hour.

Utica, New York: at about 8.30 p. m. on the 7th a violent wind and hail storm prevailed in this vicinity. At 1.20 a. m. of the 8th another very severe storm passed over the city, moving from west to east. During the latter storm, which lasted about thirty minutes, buildings were unroofed and many light structures were demolished.

Woodstock, Shenandoah county, Virginia: at 6.45 p. m. on the 7th a violent wind and rain storm occurred at this place. The streets were flooded, buildings unroofed, and trees and fencing blown down. The damage at this place is estimated at \$10,000.

Dubuque, Iowa: during the night of the 7-8th a heavy rain and hail storm passed over this place; it moved in an easterly direction and lasted about thirty minutes. Several dwellings and about twenty barns were wrecked.