

Jupiter, Fla., 22d. At Chicago, Ill., the rainfall of the 18th averaged .08 of an inch for ten minutes; at Savannah, Ga., .045 was averaged for ten minutes on the 17th, while at Washington, D. C., this rate of fall was recorded on the 1st. At the other stations named the greatest average rate of precipitation for ten minutes varied from .02 to .04 of an inch. The heaviest rainfall registered for one hour, 1.70, fell at Cincinnati, Ohio, on the 19th; 1.60 fell in one hour at Chicago, Ill., on the 18-19th, and 1.05 at New York, N. Y., on the 27th. At the other stations named the rainfall did not equal or exceed one inch an hour.

Station.	Maximum fall in—					
	5 min.		10 min.		1 hour.	
	Inch.	Date.	Inch.	Date.	Inch.	Date.
Boston, Mass	0.15	31	0.22	31	0.53	31
Cincinnati, Ohio	0.22	19	0.40	19	1.70	19
Chicago, Ill	0.45	18	0.80	18	1.60	18-19
Detroit, Mich	0.25	3	0.30	3	0.40	3
Dodge City, Kans	0.25	14	0.35	14	0.52	14-18
Jupiter, Fla	0.13	22	0.20	19	0.50	23
New York City	0.20	4	0.30	27	1.05	27
Savannah, Ga	0.30	6	0.45	17	0.80	17
San Francisco, Cal					T. *	
Saint Louis, Mo	0.20	14	0.25	14	0.30	14
Washington, D. C	0.30	1, 15	0.45	1	0.90	30

* Total for month.

The above table is a record of the heaviest rainfalls during July, 1889, for periods of five and ten minutes, and one hour, as reported by regular stations of the Signal Service furnished with self-registering gauges.

HAIL.

Descriptions of the more severe hail-storms of the month are given under "Local storms." Hail was reported during the month as follows: 1st, Ariz., Mont. 2d, Ohio. 4th, Ariz. 6th, Mont., Nev. 7th, Dak., Nebr., Tex. 8th, Colo., Kans. 9th, Nebr., N. Y., Oregon. 10th, Colo., Mo., N. Y. 11th, Dak., Va. 12th, Ill., Iowa. 13th, Ariz., Dak., Ind. T., Nebr., Utah. 14th, Ind., Ind. T., Iowa, N. H., Va. 15th, Colo., Ind. T., N. J. 16th, Ariz. 17th, Ariz., Dak., Mass., Minn., N. H., Wash. 18th, Ariz., Kans. 19th, Ariz., Dak., Kans., Nebr., Wyo. 21st, Kans. 22d, Ariz., Kans., Mo. 23d, Ky., Mass., N. H., N. Y., Ohio, Vt. 24th, Dak., Kans., Mont., Nebr., Tenn., Wyo. 25th, Iowa, Minn. 26th, Ill., Ind., Kans., Minn., Wis. 27th, Ala., Ill., Iowa, Mich., Minn., Wis. 28th, Iowa, Ohio, Tenn. 29th, Ariz., Ill., Iowa, Mo. 30th, Ariz., Mich., N. Y. 31st, Ariz.

SNOW.

Turin, Lewis Co., N. Y.: reports state that snow flakes fell in this vicinity on the afternoon of the 15th.—*Turin, N. Y., Leader, 16th.*

WINDS.

The prevailing winds during July, 1889, are shown on chart ii by arrows flying with the wind. In New England, the middle Atlantic states, west Gulf states, upper lake region, Missouri Valley, middle, eastern, and southeastern slope of the Rocky Mountains the winds were mostly southerly; in the south Atlantic and east Gulf states, southwest; over eastern Florida, southeast to southwest; over the lower lakes and the southern plateau region, south to west; in the upper Mississippi valley, south to east; on the northeastern slope of the Rocky Mountains, northwest or southwest; over the middle plateau region and along the south Pacific coast, westerly; on the north Pacific coast, north to west; on the middle Pacific coast, south to west and variable; in the Ohio valley and Tennessee, the extreme Northwest, and the northern plateau region, variable.

HIGH WINDS (in miles per hour).

Maximum velocities of fifty miles, or more, per hour, other than those given in the table of miscellaneous meteorological data, were not reported.

LOCAL STORMS.

Severe storms were most frequently reported in Ohio, where they were noted for five dates; in Iowa and Massachusetts for four dates; in Dakota, Delaware, Mississippi, Pennsylvania, and Texas for three dates; in Colorado, Connecticut, Georgia, Illinois, Kansas, Louisiana, Maryland, Michigan, Minnesota, Nebraska, New York, Virginia, West Virginia, and Wisconsin for two dates; in Arkansas, Indiana, Kentucky, Maine, Missouri, New Hampshire, New Jersey, North Carolina, Oregon, and Tennessee for one date. In states and territories other than those named no severe storms have been reported. They were reported in the greatest number of states, seven, on the 30th, when they occurred in New Hampshire, Massachusetts, Connecticut, Delaware, New Jersey, Maryland, and Mississippi; in New York, West Virginia, Kentucky, Michigan, and Ohio on the 19th; in Massachusetts, Dakota, Iowa, and Minnesota on the 17th; in Michigan, Mississippi, Wisconsin, and Illinois on the 27th; in Massachusetts, Arkansas, New York, and Missouri on the 29th; in Maryland, Connecticut, Delaware, and Virginia on the 31st; in Indiana, Ohio, and Virginia on the 14th; in Iowa, West Virginia, and Ohio on the 18th; in

Georgia, North Carolina, and Minnesota on the 25th; in North Carolina and Ohio on the 1st; in Pennsylvania and Iowa on the 2d; in Texas and Pennsylvania on the 10th; in Delaware and Dakota on the 11th; in Colorado and Pennsylvania on the 15th; in Colorado and Kansas on the 22d; and in but one state or territory on the 2d, 3d, 5th to 7th, 9th, 20th, 21st, 23d, 24th, 28th. The following are descriptions of the storms referred to:

1st. North Carolina.—Wilmington: a severe thunder-storm, passing from southwest to northeast, accompanied by vivid and incessant lightning, began 11.45 a. m. and ended 1.50 p. m. The drainage being insufficient to carry off the water, several houses on Market and Front streets were flooded. **Ohio.**—Newark, Licking Co.: the heavy wind and rain storm this evening caused a washout in the Pan Handle track, eight miles east of this city, throwing eleven cars off the track.—*New York Daily Tribune, July 2.*

2d. Pennsylvania.—Tidioute, Warren Co.: a cloud-burst occurred one mile from this place at 6 p. m. and flooded the streets in this town to a depth of one foot. Maguire Run was swollen to mammoth proportions, and caused much destruction to public and private property.—*Times, Pittsburgh, Pa., July 4.* Titusville, Crawford Co.: a terrific thunder-storm occurred at 6 p. m. It was followed by two cloud-bursts, which caused a furious overflow in Church Run which winds through the city, flooding it in some places to the first stories of the houses. Estimated damage, \$15,000. Altoona, Blair Co.: a cloud-burst broke over this city at 10 p. m., doing great damage by the water bursting the sewers and overflowing the streets. The damage is widespread.—*Commercial Gazette, Pittsburgh, Pa., July 3.* Franklin, Venango Co.: this section was visited by a terrific wind and rain storm which caused great losses to the farmers and oil producers. Hundreds of derricks were blown down, and south of the city several barns were blown over, while the damage to growing crops is heavy.—*Post, Pittsburgh, Pa., July 4.* **Iowa.**—Dubuque: a storm, moving from northwest to east, began 3.40 p. m., attended by high wind, loud thunder, and vivid lightning. The rainfall for the first ten minutes was 0.67 inch; it subsided for about ten minutes and then fell heavier than before, 2.00 inches being recorded in fifty minutes. The sewers being insufficient to carry off the water, the streets were soon flooded. Three persons were struck by lightning, one being killed. The rain storm was

the severest that has occurred here for years, the damage in this city being estimated at about \$15,000.

2-3d. Texas.—Fort Worth, Tarrant Co.: heavy rain prevailed throughout the night, and on the evening of the 3d the water which surrounded this place was the highest since 1866. All the valley was flooded and covered with six feet of water. To the north the water extended two miles, and no railroads were above water except the Santa Fé. The loss to railroad and other property is at least \$1,500,000. Crops have sustained serious damage. A small village, containing eighteen houses, four miles northeast of this city, is completely washed away. Dallas, Dallas Co.: the rain of the past three days reached a climax on the afternoon of the 3d, when for one hour the heaviest rain for three years occurred. The water, in tremendous volumes, rushed over the sidewalks and into the stores, causing large damage to stocks.—*San Antonio, Tex., Express, July 4.*

5th. Louisiana.—Marksville, Avoyelles Parish: this section was visited by a severe storm at 2 p. m., which moved from northwest to southeast and partook somewhat of the characteristics of a tornado, demolishing out-houses and levelling crops in its path, which was about one-half mile in width.—*Report of Mr. Leon Molena.*

6th. Louisiana.—New Orleans: an unusually severe thunder-storm passed over this city between 10.20 a. m. and 11 a. m. The storm was accompanied by very heavy rain, which soon flooded the streets in the lower portion of the city.

7th. Nebraska.—North Platte: a thunder-storm, moving from west to east, began 4 p. m. and ended 10.30 p. m. Rain occurred almost throughout the storm, and from 4.40 p. m. to 5.45 p. m. it fell very heavily and was accompanied by hail, some of the hail-stones measuring one-half inch in diameter. Crops of all kinds were damaged by the hail. Maximum velocity of the wind, forty-eight miles per hour, at 5.10 p. m.

9th. Oregon.—Ashland: very heavy rain fell at this place between 8.30 and 10.15 p. m. It is reported that the storm was quite severe about four miles west of this city, where hail the size of marbles fell, causing much damage to orchards.

10th. Texas.—Del Rio, Val Verde Co.: the heaviest rain that has fallen here for years occurred this morning; it was accompanied by heavy thunder and lurid lightning. The Sencas, a small creek west of this place, overflowed its banks and washed away many fences. The Rio Grande was out of its banks and over a mile wide, causing destruction in the low lands. Several small bridges on the railroad between here and Devil's River have been washed away.—*San Antonio, Tex., Express, July 11.* **Pennsylvania.**—Greensburg, Westmoreland Co.: one of the most destructive storms known in this section passed over the northern portion of this county at 4 p. m. Rain fell in torrents, and the creeks overflowed for miles around the mining village of Crab Tree. Every bridge from Crab Tree to Saltsburgh has been carried away, and from two to three hundred yards of the Crab Tree Branch Railroad were washed away.—*The Palladium, Oswego, N. Y., July 11.*

10-11th. Texas.—Laredo, Webb Co.: heavy rain began during the afternoon of the 10th and continued until 8 p. m. of the following day. The storm appeared to be general, and, as a consequence, the Rio Grande River began rising about 5 a. m. of the 11th, and had risen twelve to fifteen feet up to 8 p. m. of the same day, causing some damage to property and bridges in this section. Eagle Pass, Maverick Co.: the heavy rainfall within the last twenty-four hours has done considerable damage along this valley. The Rio Grande rose twenty feet, at the rate of three feet an hour, and reached within six feet of the great flood in 1882, causing damage along its course. Extensive washouts occurred on the Eagle Pass branch.—*San Antonio, Tex., Express, July 12.*

11th. Delaware.—Laurel, Sussex Co.: a severe rain storm passed over this locality during the evening, doing considerable damage to growing crops.—*Baltimore, Md., American, July 13.* **Dakota.**—Fort Sully: heavy rain fell from 12.17 p. m. to 12.30 p. m., accompanied by large hail between 12.23

p. m. and 12.28 p. m. Hail-stones as large as a quarter-dollar silver piece, and very irregular and jagged in formation, fell. The wind, following the course of the storm, veered from northwest to northeast, and later to east.

13th. Maryland.—Westminster, Carroll Co.: the heaviest rain for many years visited this section at 4 p. m., and continued for about half an hour. Cellars were flooded and much damage was done by the flood in the surrounding country.—*The Sun, Baltimore, Md., July 15.* **Baltimore:** a thunder-storm accompanied by rain passed over this city from west to east between 11.25 a. m. and 1.15 p. m. The rain fell in torrents in parts of the city, causing great damage. The storm was most severe about three or four miles east of here, where many bridges were swept away, and crops were much injured by the heavy rain. **Iowa.**—Davenport: one of the severest storms known in this section began 9.12 p. m. and ended during the night. The rain fell in sheets, washing out sidewalks and making the streets impassable. The rainfall on the morning of the 14th measured 5.16 inches. The storm moved from the north and northwest to east, and was accompanied by hail and high northwesterly winds, the wind attaining a maximum velocity of thirty-six miles per hour. Reports from the surrounding country state that the crops sustained considerable damage, and that several bridges in this county were washed away. **Sac City, Sac Co.:** an unusually heavy rain occurred between 6.30 p. m. and 11.30 p. m., during which time 5.00 inches fell, washing out bridges, filling cellars, etc.—*Report of Dr. Caleb Brown.* **Maine.**—Bangor, Penobscot Co.: one of the most violent thunder-storms that ever passed over this section occurred in the evening. Several houses were struck by lightning.—*Portland, Me., Press, July 15.* **Nebraska.**—Stromsburch, Polk Co.: one of the severest storms experienced here visited this section at about 8 p. m. It was preceded by a high wind which caused much damage by demolishing and overturning smaller buildings; then followed the heavy downpour which converted the streets into canals of rushing water. During the height of the storm the dam of the artificial lake gave away, and the water swept over the adjacent country carrying everything before it. The damage to property and crops is very large. **Osceola, Polk Co.:** the worst storm of the season occurred at 6 p. m. Numbers of buildings sustained serious injury.—*The Omaha, Nebr., Herald, July 14.* **Clarks, Merrick Co.:** a severe wind and rain storm passed over this section at 5 p. m. Growing crops in the surrounding country are damaged to a considerable extent.—*The Omaha, Nebr., Republican, July 14.* **Tennessee.**—Williamsport, Maury Co.: an almost unprecedented rainfall occurred near this place during the day. The mill dams in Leatherwood Creek, Hickman Co., were swept away and fields were submerged.—*The Herald, Nashville, Tenn., July 16.*

14th. Indiana.—Evansville, Vanderburgh Co.: a heavy wind and rain storm passed over this city during the afternoon, doing much damage. The electric light wires, which had been blown down, charged buildings and pools of water with electricity, and several persons were shocked and rendered unconscious thereby.—*Cleveland, Ohio, Leader and Herald, July 16.* **Ohio.**—Princeton, Butler Co.: this town was almost demolished by a terrible wind and rain storm at 4 p. m. which continued about twenty minutes. The oats and corn crops in the surrounding country were ruined, and the village was deluged by water.—*Cleveland, Ohio, Leader and Herald, July 16.* **Virginia.**—Harrisonburgh, Rockingham Co.: this section was visited in the evening by a severe hail and rain storm, doing much damage in parts of the county. Corn is ruined and the land is badly washed.—*Baltimore, Md., American, July 16.*

15th. Colorado.—Colorado Springs: a heavy rain and thunder storm passed over the country around Palmer Lake this afternoon doing considerable damage. The Denver and Rio Grande track, one mile above Palmer Lake, was badly washed in several places.—*The Denver, Colo., Daily News, July 16.* **Pennsylvania.**—Reading: an unusually heavy rain

storm prevailed early this morning throughout the Lebanon Valley. A number of creeks overflowed; fields are submerged, and crops have been washed away. At the towns of Avon, Myerstown, and Lebanon the water entered the lower floors of a number of houses.—*Cleveland, Ohio, Leader and Herald, July 16.*

17th. Massachusetts.—The thunder-storm in eastern Massachusetts, this day, was accompanied by destructive hail. At Milton nothing equal to it had been seen in forty years, some stones being one and one-half inch long and three-quarters of an inch thick. The stones were commonly discoidal with radiate structure.—*Report of the New England Meteorological Society.* Lynn: the severest hail-storm that ever visited this city occurred at 1.15 p. m. For five minutes hail-stones as big as marbles fell, causing much damage to plants and greenhouses.—*Commercial Advertiser, Buffalo, N. Y., July 17.* Newburyport: this most remarkable hail-storm, occurring between 12.40 p. m. and 1 p. m., was in many places in this immediate neighborhood very destructive. Crops were cut down and ruined and other damage done. The path of destruction varied from one and one-half to two miles in width, and extended about six miles (as far as traced) in a generally southeasterly direction from the southeastern part of West Newbury, across the southwest point of Newburyport, through the central and west-central part of Newbury, into the confines of Rowley.—*Report of Mr. F. V. Pike. Dakota.*—Pembina, Pembina Co.: a damaging hail-storm occurred in this vicinity in the evening. The hail-stones were very large, and while the belt of land affected was narrow and the storm only of a few minutes duration, it did considerable damage to the wheat crop over an area of about 1,200 acres.—*The Pioneer-Press, Pembina, Dak., July 19.* Iowa.—Burlington, Des Moines Co.: a storm of unusual severity passed over this section at 3 a. m. The wind blew almost a gale, and rain descended in torrents for over two hours; the thunder and lightning were terrific. Reports state that a great many small bridges throughout the country were swept away, and that trains from the north and south were delayed by washouts. Crops sustained considerable injury.—*Republican and Leader, La Crosse, Wis., July 18.* Minnesota.—Saint Vincent: A severe hail and rain storm, accompanied by high wind, set in from the west at 7.55 p. m. Hail fell from 8.35 p. m. to 8.45 p. m., some of the hail-stones being about one-half inch in diameter; they were, however, too scattered to do any material damage at this place. The most destructive part of the storm passed about one mile north of this city in a direction north of east, where a strip of country, about half a mile in width was devastated. Reports state that hundreds of acres of wheat fields, in Dakota, were totally destroyed by the hail. The wind at this place blew at the rate of forty miles per hour for five minutes at 8.40 p. m.

18th. Iowa.—Shenandoah, Page Co.: a tornado formed about 4.30 p. m., six miles north of this city, and moved in a southeasterly direction. While under formation the lower edges of a large black cloud began revolving, forming an inverted cone and rapidly increasing in size, the point sinking lower and lower, rising and falling alternately during its passage, and tearing a path wherever it touched the ground. The path was from sixty to two hundred feet wide, and its entire length was about one and one-half mile. It was but two or three minutes in forming, and lasted not more than fifteen minutes.—*The Shenandoah, Iowa, Sentinel, July 19.* West Virginia.—Rockport, Wood Co.: a terrific thunder-storm, accompanied by torrents of rain and vivid lightning, passed over this section during the day. At this place 19.00 inches of rain was recorded in two hours and ten minutes, causing the Tygart Creek to rise at this point twenty-two feet in one hour. This village was almost entirely swept away, and the estimated loss at this place alone will reach \$75,000. The damage along Tygart Creek will amount to \$500,000, while the injury done on Tucker's Creek, Sandy and Slate rivers will not be less. A great many lives are reported lost in the flood.—*Report of Mr. R. D. J. Echols.* Parkersburgh: owing to the heavy rains on the 18th and 19th the Little Kanawha River rose very

rapidly during the 19th and 20th, carrying down the stream, during these two days, fully 50,000 logs and cross ties. Thirteen barges loaded with logs and cross-ties sunk at the mouth of the river on the 19th. Fourteen bridges, four of which were built of iron, were washed away in this county. The damage in this county alone is estimated at \$500,000, and this county has suffered less injury than either Wirt, Jackson, or Roane counties. Morristown, a small village in Wirt county, was entirely swept away by the flood, leaving only the wreck of one house where the village once stood, and nineteen people are known to have been drowned. Ohio.—Logan, Hocking Co.: the thunder-storm which occurred in the evening was the severest known here for years. The rain fell in torrents for four hours, while the thunder and lightning were terrific. A number of houses in the eastern or the lower portion of the city were submerged, several bridges were washed away, trains delayed, and great damage was done to crops in valleys. Waverly, Pike Co.: the heaviest rain known here visited this section during the evening. Eight or ten miles north of this city a cloud-burst occurred, deluging the surrounding country. Several hundred feet of the Ohio canal bank were washed out, and one hundred feet of the aqueduct at Stony Creek went down, and the big stone culvert at Indian Creek burst. Chillicothe, Ross Co.: the worst disaster that has befallen this city since the great fire of 1851, which swept away half the town, was the thunder and rain storm which burst upon the city at 9 p. m., and continued for four hours. In many residences the water was from six inches to three feet deep on the first floor. Reports show that the Ohio and Erie Canal broke in many places, inundating farmlands. The storm was quite general for several miles around this city. On the Scioto Valley Railroad, near Higby's station, this county, a trestle went down. On the Cincinnati, Washington, and Baltimore Railroad, a few miles east of here, there are several washouts and a number of large bridges are down. The village of Vigo, twelve miles east of here, was nearly ruined by the flood. Several houses floated from their foundations and many horses and cattle were drowned. At Massieville, five miles south of this city, the village was submerged and many houses were torn from their foundations. The inhabitants abandoned their homes and escaped to the hills. Reports from the country districts state that the storm carried off vast quantities of unthreshed wheat, growing corn, and other crops. The loss in this particular was very heavy.—*The Enquirer, Cincinnati, Ohio, July 20.*

19th. New York.—Little Falls, Herkimer Co.: a terrific rain storm swept over the southeastern portion of this county in the evening. The storm was most destructive in the village of Newville and along Nowadaga and Indian Castle creeks, where houses and barns were swept away by the torrents, together with several iron bridges. The waters in the Nowadaga Creek rose fourteen feet in about as many minutes, causing a flood, which swept everything before it.—*New York Daily Tribune, July 21.* Kentucky.—Hopkinsville, Christian Co.: one of the most destructive thunder-storms in years passed over this section during the evening. Reports of serious damage are being received from different parts of this county.—*Saint Louis, Mo., Post-Dispatch, July 21.* West Virginia.—Charleston, Kanawha Co.: a cloud-burst occurred on Elk River this morning causing a great deal of damage to lumbermen and farmers.—*The Chronicle, La Crosse, Wis., July 20.* Michigan.—Alpena: a severe thunder-storm, moving from west to southeast, passed over this city between 4.30 a. m. and 6.30 a. m. The lightning struck and set fire to a mill. Ohio.—Cincinnati: a severe thunder-storm, accompanied by heavy rain, passed over this city at 3 a. m. The Ohio Canal broke at York street, and a number of persons were rescued with difficulty. The storm was general in the state. Lightning set fire to the small village of Georgesville, Franklin Co., and one-half of the town was burned.—*The Chronicle, La Crosse, Wis., July 20.*

20th. Massachusetts.—East Brookfield, Worcester Co.: a

destructive thunder-storm, accompanied by high wind, occurred in the evening. It extended throughout the central and western portion of the state, causing considerable damage to fruit trees and small buildings. At Spencer, this county, the lightning damaged the switchboard and other appurtenances in the telephone exchange, besides burning out nearly all the local lines of the New England Telephone and Telegraph Exchange Company.—*New York Daily Tribune, July 21.*

21st. Illinois.—Jacksonville, Morgan Co.: a severe wind and rain storm passed over this county in the evening, prostrating growing crops, buildings, and trees. Several horses and cattle were killed, and a number of persons seriously injured.—*Evening Herald, Duluth, Minn., July 23.*

22d. Colorado.—Denver: a heavy rain fell in the evening, damaging the streets and flooding cellars. The storm was general throughout the state, and great damage was done to crops and railroads. The Santa Fé and Rio Grande roads were washed out in several places between here and Pueblo.—*Duluth, Minn., Daily News, July 24.*

22-23d. Kansas.—Concordia: unusually heavy rain fell from 5 p. m. to 6.15 p. m., 22d. Light thunder was heard at 2.15 a. m., 23d, and rain began soon afterwards and continued until 4.25 p. m. The rain was the heaviest that has fallen here in many years, 5.14 inches being recorded in twenty-four hours, flooding many streets and cellars. 24th: bottom lands for about three or four miles in this section were submerged. Most of this land is under cultivation, and the crops have been greatly damaged. The trains on most of the railroads leading to this city have been delayed by washouts.

22d, 23d, and 24th. Kansas.—Independence, Montgomery Co.: the heavy rain during these days caused the Verdigris to overflow its banks in places, which, with the back water in the smaller streams, has done considerable damage to the growing corn and wheat in stack and shock.—*Report of J. M. Altaffer to the Kansas State Weather Service.*

23d. Kansas.—Topeka: the heavy rain which prevailed during the greater part of the day caused the Shunganunga Creek to overflow its banks, flooding bottom lands and the lower portion of this city and washing away sidewalks, etc.

24th. Dakota.—Deadwood: the heaviest rain that has visited this section for years occurred in the evening, causing Wood Creek to swell very high, and doing much damage to the bridges on the Deadwood Central Railroad. The storm was accompanied by thunder and lightning, and in some parts by hail.—*Evening Herald, Duluth, Minn., July 26.*

25th. Georgia.—Hephzibah, Richmond Co.: a thunder-storm, which began 8 p. m. and ended at midnight, was attended by a continuous roar of thunder, brilliant lightning, and unusually heavy rain, 4.90 inches of rain being recorded in four hours.—*Report of Robert L. Rhodes.* Augusta: an unusually heavy thunder and rain storm, which, according to reports, was confined to an area of twenty square miles around this city, began 8 p. m. and ended 2 a. m. the following day. The rain fell in sheets from 8.30 p. m. to 10 p. m., in that time 3.00 inches having fallen. The rain caused considerable injury to crops, and the Augusta, Gibson, and Sandersville Railroad sustained some injury by washouts, the Whitehead trestle, fourteen miles from this city, being swept away.—*The Augusta, Ga., Chronicle, July 27.* North Carolina.—Wilmington: it is reported from Taylor's Bridge, Sampson Co., that the heaviest rain ever known at that place occurred between 6.30 a. m. and 9 p. m. Three mills were carried away; estimated damage \$3,000. Minnesota.—Litchfield, Meeker Co.: this section was visited during the day by a number of short but severe rain storms. One of them, in the southern portion of the county, was accompanied by hail which was very destructive to the wheat and other crops.—*The Daily Pioneer Press, Saint Paul, Minn., July 27.* New Prague, Scott Co.: a storm, about one hundred feet in width, passed half a mile west of here this afternoon. One house and five wheat laden railroad cars were destroyed. Crops in the path of the storm were demolished. Morristown, Rice Co.: a severe hail and electric

storm passed over this vicinity this afternoon. Several buildings were demolished. At Anoka, Anoka Co., the storm was unusually severe. Much damage is reported from the surrounding country.—*The Chronicle, La Crosse, Wis., July 26.*

26th. Georgia.—Cumming, Forsyth Co.: a cloud-burst occurred near this place late in the evening, causing considerable damage. A mill dam was washed away, carrying with it the mill, cotton-gin, and other machinery. The most damage was done to the corn crop, acres of which were washed away.—*Savannah, Ga., Morning News, July 31.*

26-27th. Wisconsin.—Prairie du Chien, Crawford Co.: during the severe hail, rain, and wind storm late in the afternoon of the 26th, and another of greater magnitude the following morning, the streets became deluged with water and hail was lying in drifts in the streets. The crops in the surrounding country sustained serious damage from the hail. The dam across the mouth of Saint Feriole was swept away.—*Evening Wisconsin, Milwaukee, Wis., July 27.*

27th. Michigan.—Hamilton, Allegan Co.: one of the most destructive storms that ever visited this region burst over this village at 6.30 p. m. The storm came from the west and was accompanied by wind, hail, and lightning, blowing down buildings, &c. Hail fell in great quantities, some of the hail-stones having a diameter of one and one-half inch, doing great damage to crops. Corunna, Shiawassee Co.: a thunder and wind storm of unusual severity passed over this county in the evening and did great damage to crops and buildings. Grand Ledge, Eaton Co.: a severe wind, rain, and hail-storm swept over this vicinity during the evening, flooding fields and knocking down oats and corn. Reports from Saint John's, Clinton Co., state that the storm was of a similar nature at that place.—*Detroit, Mich., Free Press, July 30.* Lansing: a thunder-storm, accompanied by vivid lightning, began at 8 p. m. and ended during the night. The rainfall was very heavy between 8.30 p. m. and 9.20 p. m., and the wind attained a maximum velocity of thirty-eight miles per hour at 8.45 p. m. from the southwest. Reports show that crops and orchards in this vicinity were considerably damaged. Mississippi.—Natchez, Adams Co.: a violent wind storm passed over this city in the afternoon, accompanied by considerable rain. It prostrated telegraph wires, and caused much damage to the growing cotton and corn.—*The Evening Post, Vicksburg, Miss., July 30.* Wisconsin.—Milwaukee: the storm of wind, hail, and rain that visited the southern portion of the state in the afternoon was very destructive, and reports from many localities state that the growing crops were almost totally ruined. One account, from the northern part of Walworth county, says that an area of seven miles in width from north to south, and twelve miles long, was devastated by the storm, so that the crops will be comparatively worthless.—*Milwaukee Journal, Milwaukee, Wis., July 30.* Clinton, Rock Co.: the tobacco in this vicinity was destroyed by the severe hail-storm in the afternoon. Delavan, Walworth Co.: a heavy storm of rain and hail passed over this section in the evening, doing considerable damage to the grain and tobacco crops. Several fine fields of tobacco near Darien, this county, were entirely destroyed. Palmyra, Jefferson Co.: the violent rain storm which occurred in the evening was accompanied by hail-stones as large as marbles, damaging the tobacco and other crops. Ashland, Ashland Co.: a destructive wind storm passed over this city in the afternoon. Over 150,000 feet of lumber, piled up on the docks along the bay, were blown into the Chequamegon. The big refuse burner of the Superior Lumber Company, costing \$10,000, was blown down and completely wrecked; much other damage to property was done.—*Evening Wisconsin, Milwaukee, Wis., July 29.* Illinois.—Chicago: a very destructive thunder-storm, accompanied by lightning and unusually heavy rain, occurred between 6.40 p. m. and 10.30 p. m. From 7.06 p. m. to 10.40 p. m. 4.02 inches of rain fell, which is the heaviest rainfall recorded here since the opening of the Signal Service station in 1870. Large hail fell in the southern and western portions of the city. The damage done by the

storm in this city is estimated at over one million dollars, and several lives were lost by falling buildings. The storm moved from southwest to northeast.

28th. Ohio.—Findlay: a destructive storm of wind, hail, and rain swept over this city in the evening. The wind was very high, and the rainfall heavy, while hail as large as hickory nuts fell. It was the most destructive storm of the year, and the loss to property is likely to be very great.—*The Daily American, Nashville, Tenn., July 30.*

29th. Massachusetts.—North Wilbraham, Hampden Co.: an unusually high wind, immediately followed by a terrific rain storm, occurred late in the afternoon, doing considerable damage to property. Public thoroughfares were badly washed in the western portion of the state.—*New London, Conn., Day, July 30.* **Arkansas.**—Clarksville, Johnson Co.: the heaviest rain on record at this place began about midnight 28-29th, and continued until 8 a. m. 29th. All the streets in the city were under water from six inches to five feet, and people took to the hills for safety. The damage in the city, however, was very slight, but in the country, especially in the creek bottoms, crops were blown and washed down. The railway bridges, culverts, and tracks were badly washed. The damage done by the flood in this county is estimated at \$50,000. Fayetteville, Washington Co.: the most terrific storm known here swept over this county during the morning. The thunder was a loud, unceasing roar, with lurid lightning, and the rain poured down in torrents. Much damage was done throughout this county to crops and property; Center Township alone estimates its loss at \$10,000. The Illinois Creek rose four feet higher than ever known, and crops along its banks were swept away. The Fort Smith railway bridge over White River was washed away, and damage was done to the Pacific and Great Eastern railway bridge at Wyman. Distressing reports of loss of property come from every direction.—*The Arkansas Gazette, Little Rock, Ark., July 30.* **New York.**—Saratoga Springs: the heaviest rain and wind storm of the summer burst over this place at 2 p. m., and in less than an hour one inch and one-half of rain fell. The sewers being inadequate to carry off the water, the cellars in the lower portion of the city were flooded. Adjacent villages report that the storm was also very severe.—*Post-Express, Rochester, N. Y., July 30.* **Missouri.**—Springfield: a thunder-storm, moving from southwest to southeast, began 2.38 a. m. and ended 2.54 a. m. The storm was accompanied by excessive rain and large hail. The hail-stones consisted of solid globes of ice, some of them measuring three inches in diameter. The smaller stones when cut in two exhibited a radiated structure.

29-30th. Mississippi.—Duck Hill, Montgomery Co.: the rainfall during the evening of the 29th and throughout the following day was the heaviest for years in this section. All the large streams have overflowed their banks, and thousands of acres of cotton and corn are submerged.—*Republican, Saint Louis, Mo., July 31.*

30th. New Hampshire.—Concord, Merrimack Co.: a destructive storm passed over the southern portion of this city at about noon, the damage of which can hardly be estimated. The storm was confined to narrow limits, and its course was a little south of east, having none of the characteristics of a

tornado. The wind blew with a tremendous velocity, and seemed to gather strength as it progressed, tearing up immense trees by the roots. *Report of Mr. William L. Foster.* Manchester: a severe thunder-storm, accompanied by rain at intervals, occurred between 1.40 p. m. and 2 p. m. The heavy rain washed the streets badly in many places, and cellars and basements were flooded. The storm moved from southwest to northeast. **New Jersey.**—Newark, Essex Co.: the most destructive storm that has visited this section occurred this afternoon and evening. In this city cellars were flooded and sewers burst, and work had to be suspended in the factories in the lower section of the city. A washout occurred on the Morris and Essex Railroad, at South Orange, and several buildings, including the post office, were carried away. In Orange Valley the water is up to the second story. Bloomfield and Mount Clare also report great damage to property, caused by the flood. Plainfield, Union Co.: the greatest flood ever known here followed the unusually heavy rain this afternoon, and a number of washouts and broken dams are reported. At 4 p. m. Coddington's dam, on Stony Brook, gave away and the large body of water carried off several ice-houses and other buildings along its course. The great cut on the Jersey Central Railroad at Fanwood was also flooded this afternoon.—*Ledger and Transcript, Philadelphia, Pa., July 31.* **Massachusetts.**—Haverhill, Essex Co.: the storm which visited this section at 2.30 p. m., came suddenly and with almost a hurricane force. It passed along in a belt half a mile wide, uprooting trees and damaging crops. Pittsfield, Berkshire Co.: the heavy rain which has prevailed since the 27th caused a washout to-day on the Housatonic, and Boston and Albany railroads.—*Argus, Portland, Me., July 31.*

30-31st. Maryland.—Baltimore: unusually heavy rain occurred at intervals between 7.20 p. m. 30th and the evening of the 31st, 4.02 inches having fallen during the twenty-four hours ending 7.20 p. m. 31st. A great deal of damage was done to roads and crops, and a small washout occurred on the Maryland and Central Railroad. **Connecticut.**—New Haven: a thunder-storm, moving from southwest to northeast, occurred at 1.35 p. m. 30th. The storm was accompanied by heavy rain, which continued at intervals until 3.30 p. m. the following day, 6.15 inches having fallen during the twenty-four hours ending 3.30 p. m. 31st. Dams and bridges were carried away, and other casualties done by the flood in this section. Damage estimated at \$1,000,000. **Delaware.**—Wilmington: during the past forty-eight hours the entire Delaware and Chesapeake peninsula has suffered from tremendous rain storms, which have resulted, in many sections, in disastrous floods and washouts. The low lying districts in this city are inundated. The worst feature of the heavy rains is the damage to crops in the lower part of the state and on the lower peninsula. The Baltimore and Delaware Bay Railroad, between Clayton and Bombay Hook, is damaged by washouts.—*Ledger and Transcript, Philadelphia, Pa., August 1.*

31st. Virginia.—Lynchburgh: rain began at about midnight and continued until 3.15 p. m. It began again at 5.15 p. m. and ended 7.40 p. m.; in that time 2.96 inches had fallen. The James River rose ten or twelve feet during the day. Washouts are reported at Indian Rock, Botetourt Co., on the Richmond and Alleghany Railroad.

INLAND NAVIGATION.

FLOODS.

The following reports show that the most disastrous floods of the month occurred near Lynchburgh, Va., on the 2d; at Johnstown, N. Y., on the 9th; at Austin, Tex., on the 12th; and in parts of east-central and southeastern Pennsylvania, and at Middletown, Conn., on the 31st.

Lynchburgh, Va., 2d: the east bound express on the Norfolk and Western Railroad ran into a washout this morning, three

miles from here, and was completely wrecked. It is reported that between thirty and forty passengers were killed.—*The Palladium, Oswego, N. Y., July 2.*

Johnstown, Fulton Co., N. Y., 9th: a destructive flood swept down the valley of Cayadutta Creek in the evening, drowning a number of persons and destroying a great deal of property. The water rose fifteen feet in a few minutes and overflowed the surrounding country. At this place ten people are missing