

Maximum rainfall in one hour or less—Continued.

Station.	Maximum fall in—					
	5 min.	Date.	10 min.	Date.	1 hour.	Date.
	Inch.		Inch.		Inch.	
Memphis, Tenn.....	0.35	26	0.45	26	0.45	26
New York, N. Y.....	0.18	28	0.32	28	0.45	24
New Orleans, La.....	0.22	26	0.27	26	0.31	25
Norfolk, Va.....	0.27	29	0.40	17, 29	1.25	17
Philadelphia, Pa.....	0.12	29	0.18	29	0.57	29
Philadelphia Water Works.....	0.12	4	0.23	4	0.68	4
Pittsburg, Pa.....	0.30	30	0.37	14	0.70	14
Portland, Oregon.....	0.03	10	0.06	10	0.10	10
Saint Louis, Mo.....	0.09	17	0.14	7	0.45	7
Saint Paul, Minn.....	0.05	21	0.07	6	0.23	6
San Diego, Cal.....						
San Francisco, Cal.....						
Savannah, Ga.....	0.47	18	0.92	18	1.90	18
Washington, D. C.....	0.40	15	0.50	15	0.65	15
Wilmington, N. C.....	0.23	1, 16	0.33	1	0.77	25

* Register not working.

† Less than 0.05 in 1 hour.

HAIL.

Description of the more severe hail storms of the month is given under "Local storms." Hail was reported as follows: 1st, Iowa, Missouri, New York, South Dakota. 2d, Illinois, Iowa, Kansas, Missouri, North Dakota, Ohio, Virginia, Wisconsin. 3d, Connecticut, Kansas, Maryland, Montana, Nebraska, New Jersey, New Mexico, New York, Ohio, Oregon, Pennsylvania. 4th, Colorado, Montana, Nebraska, New Mexico, New York, Pennsylvania, Utah. 5th, Colorado, South

Dakota, Washington. 6th, Colorado, Kansas, Missouri, Nebraska. 7th, Idaho, Missouri, Nebraska, Oregon, Texas, Wyoming. 8th, Wyoming. 9th, South Dakota. 10th, Iowa, Kansas, Nebraska, Wyoming. 11th, Kansas, Nebraska, North Dakota. 12th, Nebraska, North Dakota, South Dakota, Wyoming. 13th, Kansas, Michigan, Missouri, Wisconsin. 14th, Colorado, Michigan, Nebraska, New Mexico, New York, Ohio. 15th, Colorado, Maryland, Mississippi, Nebraska, New York. 16th, Arizona, Colorado, Iowa, Minnesota, Missouri, Nebraska, Oregon, Wisconsin. 17th, Colorado, Nebraska, Wisconsin, Wyoming. 18th, Colorado, Kansas, Missouri, Montana. 19th, Colorado, Montana, Nebraska, South Carolina. 20th, Michigan, Missouri, Nebraska, New York, North Dakota, Pennsylvania, South Dakota, Virginia. 21st, Colorado, Iowa, Kansas, Michigan, Minnesota, Nebraska, North Dakota, South Dakota. 22d, Colorado, Iowa, Kansas, Minnesota, Missouri, South Dakota. 23d, Colorado, Louisiana, Ohio, South Dakota. 24th, Colorado, Michigan, Missouri, Nebraska, New York, Pennsylvania, West Virginia. 25th, Colorado, Connecticut, Maine, Montana, New Hampshire, New York, North Carolina, Vermont. 26th, Colorado, Connecticut, Kansas, Nebraska, New York, South Dakota, Utah. 27th, Colorado, Maine, Nebraska, South Dakota. 28th, Iowa, Maryland, Nebraska, Nevada, New York, North Dakota, Wisconsin. 29th, Colorado, Iowa, Michigan, Nevada, Oregon, Wisconsin. 30th, Colorado, Nebraska, Pennsylvania. 31st, Colorado, Iowa. Sleet was reported in Colorado on the 27th and 29th.

WINDS.

The normal distribution of atmospheric pressure in July favors southerly winds east of the Rocky Mountains, variable winds over the Rocky Mountain and plateau regions, northerly winds on the north Pacific coast, and south to west winds on the middle and south Pacific coasts. For the current month southeast to southwest winds prevailed over the Atlantic and east Gulf states, Florida, the middle and southeast slopes of the Rocky Mountains, and the middle and northern plateau regions; in the Ohio Valley and Tennessee, the upper Mississippi valley, and on the middle Pacific coast they were generally from southwest to northwest; in the west Gulf states and the lower Rio Grande valley, from the southeast; in the Lake region, from south to west, except over Lake Superior, where they were from northwest to north; in the Red River of the North Valley, from the north; in the Missouri Valley, from the southwest; on the northeast slope of the Rocky Mountains, from the east; on the north Pacific coast, from west to north; on the south Pacific coast, from the west; and over the southern plateau region, variable. The most frequent direction of the wind at each station of the Weather Bureau is shown on Chart II by an arrow flying with the wind.

HIGH WINDS.

[In miles per hour.]

Wind velocities of 50 miles, or more, per hour were reported at stations of the Weather Bureau as follows: 2d, 50, ne., at Chicago, Ill. 4th, 56, sw., at Mount Killington, Vt. 5th, 60, se., at Galveston, Tex.; 57, nw., at Rapid City, S. Dak. 8th, 50, ne., at Chicago, Ill.; 50, sw., at Kitty Hawk, N. C. 14th, 76, nw., at Mount Washington, N. H.; 54, w., at Pueblo, Colo. 15th, 78, sw., at Green Mountain, Me. 21st, 50, n., at Yankton, S. Dak. 26th, 53, n., at Pueblo, Colo. 28th, 50, sw., at Yankton, S. Dak.

LOCAL STORMS.

1st.—Severe local storms occurred in Iowa and Missouri. At Gray, Iowa, a funnel-shaped cloud was reported; it revolved from right to left, and the path of destruction was about 3 rods in width. Seven barns, 2 dwellings, and a schoolhouse were destroyed. At Arcadia, Iowa, a thunderstorm, with heavy rain and hail, moved southward about 7 p. m., central

time, damaging buildings and crops. At Halbur, Iowa, a heavy hailstorm moved south in a path about one mile in width at 6.30 p. m. Near Glendon, Guthrie Co., Iowa, a boy was killed by lightning. At Alta, Iowa, a destructive hailstorm passed over a strip of country about 2 miles in width; a hailstorm also occurred in Sac county. A small funnel-shaped cloud was reported a few miles southwest of Aurelia, Cherokee Co., Iowa, about 5 p. m., which destroyed a barn and several small buildings. Heavy wind, rain, and hailstorms caused damage in Henry, Carroll, Howard, Livingston, and Randolph counties, Mo. At Leonardtown, Md., a heavy rainstorm damaged bridges, roads, and crops.

2d.—A destructive hailstorm visited Ransom and Sargent counties, N. Dak., in the afternoon. A severe wind, rain, and hailstorm occurred in Osborne county, Kans., and in Sumner county, Kans., a child was killed by lightning. A heavy hailstorm was reported in the afternoon at Galena, Ill., and at Goshen, Ind., a man was killed by lightning. A thunderstorm, with light rain and heavy hail, moved southwest over Westside, Iowa, causing damage to buildings, trees, etc. A thunderstorm from the northwest passed over Milwaukee, Wis., at 5.30 p. m., 75th meridian time; the Life Saving Station was struck by lightning and 1 man severely injured. A rain, wind, and thunderstorm occurred at Jupiter, Fla., in the afternoon; electric wires were burned out and the telegraph line was prostrated.

3d.—Severe thunderstorms were reported in Oswego county, N. Y., Berks county, Pa., and Saint Marys county, Md. In Berks county, Pa., 2 barns were struck by lightning and burned. In Saint Marys county, Md., 3 persons were killed and others injured by lightning. At Buffalo, N. Y., a severe gale occurred, the wind reaching a velocity of 46 miles per hour. A heavy thunderstorm, with hail, caused considerable damage near Stafford, Kans. At Walla Walla, Wash., a severe duststorm, with rain, occurred in the evening. The wind reached a velocity of 44 miles per hour from the southwest, and an extreme velocity of 50 miles per hour, causing minor damage.

4th.—A heavy storm of wind and rain commenced at Galveston, Tex., in the evening and continued during the 5th.

At Salt Lake City, Utah, during a thunder and hailstorm lasting 40 minutes, the temperature fell from 90° to 74°. A thunderstorm, with hail and rain, was reported at Genoa, Nebr. During a heavy thunderstorm at Fernandina, Fla., a man was killed by lightning.

5th.—Severe storms occurred on the west Gulf coast and in the lower Mississippi valley. At Galveston, Tex., the wind reached a velocity of 60 miles per hour at 9 p. m., 75th meridian time; parts of the city were submerged by water driven by wind from the Gulf; a small fishing vessel was capsized in the bay about 9 p. m., and 4 persons drowned. A heavy thunderstorm passed over Fort Stanton, N. Mex., between 7 and 8 p. m.; heavy rainfall flooded streams in that region, damaging property on low lands. In the afternoon a destructive thunder and hailstorm visited Rapid City, S. Dak., damaging crops and killing stock. During a heavy thunderstorm at Alton, Kans., several houses were struck by lightning and damage was caused to crops by heavy rain. A severe wind and rainstorm occurred in Bent and Ottawa counties, Colo., in the afternoon. At Alexander, Washington Co., Me., several head of cattle were killed and a barn was struck by lightning and burned.

6th.—A destructive tornado visited Baton Rouge, La., about 6 a. m. It moved northeastward in a path about 300 yards in width, unroofing buildings, uprooting trees, etc., and about a mile from where the destruction commenced it wrecked a building of the State Penitentiary, killing 10 and injuring 38 convicts. At Madison Station, Miss., a storm moved northwest in a path about 100 yards in width about noon, with light rain before and after, but neither thunder, lightning, nor hail. A funnel-shaped cloud with a whirling motion from right to left appeared; it was apparently 400 to 500 feet in height; seemed to open and close, and presented a bright appearance inside. One person was killed, and buildings were destroyed to the value of about \$4,000. Trees torn up by the storm were thrown in all directions. At Van Zants Switch, 12 miles south of Brookhaven, Miss., a storm occurred in the early morning, badly injuring several persons. At Gloster, Miss., a storm moved northeast in a path about $\frac{1}{2}$ mile in width at 7.30 a. m., killing 2 persons and destroying outhouses. Very heavy rain fell before the storm and timber was thrown in all directions. Severe thunderstorms were reported in other parts of Mississippi. Heavy thunder and rainstorms visited Chicago, Ill., and points in the northwest at night. A heavy thunder and rainstorm caused damage to buildings and crops in northeast Nebraska. At Dodge City, Kans., a thunderstorm, with heavy rain and hail, occurred in the evening; 2 houses were struck, and several persons were stunned by lightning. At Sioux City, Iowa, several persons were struck, and 1 person was killed by lightning. At Dubuque, Iowa, heavy rain flooded streets and cellars. Great damage was caused to crops about Davenport, Iowa, by heavy rain.

7th.—Near Prosperity, S. C., a storm moved northeast about 2.45 a. m., with heavy rain, thunder, and lightning. The clouds were small, presenting a glowing appearance, and appeared to revolve from right to left. Objects, such as trees, were thrown in all directions; buildings were damaged to the extent of about \$1,000, and great injury was done to crops. At Baltimore, Md., some damage was caused by heavy rain on the 7-8th, and a building was struck by lightning. At Washington, Pa., a man was stunned by lightning. A severe gale prevailed over Lake Michigan. Heavy rains attended thunderstorms in east Kansas, Nebraska, and west Missouri. At Abilene, Kans., several houses were struck by lightning. Railroad bridges about Omaha, Nebr., were washed away, delaying traffic. A heavy wind, rain, and thunderstorm visited Kyle, Tex. Lightning damaged buildings and electric wires at Kansas City, Mo. A destructive hailstorm occurred at Bellevue, Idaho.

8th.—A heavy gale prevailed over Chesapeake Bay, and damage was done by wind, lightning, and rain in Maryland. A severe storm was reported in the southwest part of Sussex

county, Va. At Michigan City, Ind., a man was reported killed by lightning. Heavy rain washed away bridges, etc., near Meridian, Miss.

10th.—Heavy rain flooded streets and undermined buildings at Sioux City, Iowa. Heavy windstorms were reported in southwest Minnesota.

11th.—Heavy rain washed out railroad tracks and carried away bridges in North Dakota. A destructive hailstorm was reported in the Valley of the Cannon Ball River, N. Dak.

12th.—Severe storms occurred from Michigan to the Dakotas. At Clare, Mich., buildings were unroofed and trees blown down. Near Jamestown, N. Dak., several buildings were destroyed, and crops were damaged by heavy wind and rain. Hailstorms were reported in Dicky county, N. Dak., and near Aberdeen, S. Dak. During a thunderstorm at Key West, Fla., in the evening, 0.50 inch of rain fell in 10 minutes, and the temperature fell 17° in 15 minutes. A waterspout was observed between 4 and 5 p. m. in Tampa Bay, Fla.

13th.—Severe storms occurred in Michigan, Wisconsin, and the upper Mississippi and lower Missouri valleys. In Michigan damage was caused by wind and lightning. A destructive hailstorm was reported in Outagamie county Wis. At Green Bay, Wis., the wind reached a velocity of 45 miles per hour from the southwest, and the High School building was struck by lightning. A severe windstorm passed over La Crosse, Wis., in the afternoon. Considerable damage was caused to buildings in the south part of Dubuque county, Iowa. At Davenport, Iowa, the wind reached a velocity of 42 miles per hour from the southeast. Severe storms were reported in McLean and Jackson counties, Ill. Disastrous storms visited central and western Missouri. Near Sedalia, Mo., a house was struck by lightning and 1 person killed and another fatally injured. Several buildings were reported struck by lightning in western Missouri and east Kansas, and much damage was caused to property and crops by heavy rain. At Fort Assiniboine, Mont., heavy rain which began on the 11th ended in the early morning; streams in that region were swollen and the Government dam on Beaver Creek was washed away.

14th.—Destructive storms were reported in New York, Pennsylvania, Maryland, Ohio, Indiana, Illinois, Michigan, and Arkansas. At East Ottawa, Cattaraugus Co., N. Y., a revolving storm, with a heavy fall of small hail, caused damage to buildings and trees. In Rockland county, N. Y., several buildings were struck by lightning. Lightning also caused damage in Chautauqua county, N. Y. In Erie county, Pa., 2 persons were killed, another seriously injured, and four buildings were struck by lightning. A heavy thunderstorm occurred at night near Pittsburg, Pa. An unusually heavy rainstorm occurred in Carroll county, Md. In Saint Marys county, Md., a building was struck by lightning and several persons were injured. A man and 2 horses were killed by lightning at South Bend, Ind. Damage was caused by lightning at Chicago, Ill. About 5.15 a. m., 75th meridian time, a squall moved north off Thunder Bay Island, about 9 miles distant from Alpena, Mich. It appeared to revolve, and the wind was very heavy within its influence for about 7 minutes; rain fell in torrents, the lightning was very vivid, and a loud noise like continuous thunder was heard. A schooner in the path of the storm was damaged to the extent of about \$1,000. About the time this storm occurred the barograph sheet in the Weather Bureau Office at Alpena indicated a sudden decrease in pressure of about .08 inch. A heavy rain and thunderstorm occurred near Little Rock, Ark., in the evening. During a thunderstorm and west gale at Pueblo, Colo., the wind reached a velocity of 54 miles per hour, and the temperature fell 20° in 1 hour.

15th.—Heavy thunderstorms occurred in New England, New York, Pennsylvania, New Jersey, Indiana, and Arkansas. In the Connecticut Valley and Maine buildings were struck by lightning and damage was done by wind and rain. At 5 p. m. a storm broke over Danbury, Conn.; several houses were

struck, and stock was killed by lightning. Damage was caused by lightning in Rhode Island. A heavy hailstorm visited Congers, N. Y., in the evening, and damage was caused along the Hudson River by lightning, wind, and rain. Unusually heavy thunderstorms occurred in Morris county, N. J., and in Erie county, Pa. A hailstorm was reported near Quantico, Md. Several persons were reported killed by lightning near Muncie, Ind.

16th.—During a heavy wind and thunderstorm at West Superior, Wis., in the afternoon, a building in course of construction was blown down, and 5 persons were reported killed or fatally hurt and others injured. Damage was done to other buildings in West Superior and Superior, and destructive thunder and hailstorms occurred throughout northern Wisconsin and northeast Minnesota. Two persons were reported killed by lightning at Clintonville, Wis. At Duluth, Minn., several buildings were blown down and water flooded cellars and basements. Damage was caused by lightning at Alta and Sioux City, Iowa. Thunder and hailstorms were reported in parts of Nebraska. At North Platte, Nebr., the wind reached a velocity of 48 miles per hour from the northwest. A destructive hailstorm occurred in the west part of Weld county and the eastern parts of Larimer and Boulder counties, Colo. During a violent thunder and hailstorm at Fort Grant, Ariz., in the afternoon, the wind reached a velocity of 38 miles per hour, and 0.62 inch of rain fell in 25 minutes.

17th.—A severe thunderstorm occurred at Marquette, Mich., in the afternoon. Considerable damage was caused by heavy rain, and the electric street railway suspended operation. At Huron, S. Dak., 2 buildings were struck by lightning. A heavy rain and hailstorm occurred in the evening at Cheyenne, Wyo.

18th.—About 5 p. m. a tornado passed northeast over the northern part of Charles county, and crossed Prince Georges, Calvert, and Anne Arundel counties, Md., seriously injuring 5 persons, destroying a number of buildings, prostrating trees, etc., the estimated damage amounting to \$12,000. A heavy windstorm prevailed along the New Jersey coast. A violent hailstorm swept over the northern part of Pawnee county, Kans., at night. During a thunder and hailstorm at Castle, Mont., 2 men and 2 oxen were killed by lightning.

19th.—At North Platte, Nebr., a thunderstorm in the evening was followed by a severe west gale, during which the wind reached a velocity of 48 miles per hour, and the temperature fell 22°. At Castle, Mont., hailstones averaging about $\frac{3}{8}$ inch in diameter fell for 10 minutes during a severe thunder and rainstorm.

20th.—A destructive hailstorm visited the eastern part of Hillsdale and the western part of Lenawee counties, Mich., in the afternoon. A thunderstorm, with heavy rain and hail, occurred at Staunton, Va. A severe thunder and hailstorm was reported at and about Schenectady, N. Y., in the afternoon. Heavy rainstorms, attended in places by hail, were reported in North and South Dakota.

21st.—Destructive hailstorms occurred in Minnesota, Nebraska, and the Dakotas, and heavy rain in Cherokee Co., Iowa. A hailstorm covering a strip about 2 miles in width and 30 miles in length passed through Norman Co., Minn., destroying crops, etc.: severe storms were also reported in Steele and Nobles counties, Minn. A hailstorm swept over the north part of Dicky county, N. Dak., and the north part of McPherson county, S. Dak., at night, in a path about 3 miles in width. A heavy rainstorm, with hail, was reported in Cass county, N. Dak., and hailstorms in Brown and Hughes counties, S. Dak. Heavy rain, thunder, and windstorms at night caused considerable damage in central and northwest Iowa. At Spencer, Iowa, 1 man was killed, and several buildings were struck by lightning. A barn was struck by lightning and burned near Panama, Iowa. A severe thunder, rain, and hailstorm occurred at night at Alta, Iowa. Near Hartington, Nebr., 2 persons were seriously injured, and several houses were struck by lightning.

22d.—Heavy storms occurred in western Pennsylvania, southeast Minnesota, Iowa, Kansas, and South Dakota. In western Pennsylvania damage was caused by lightning and heavy rain, and two persons were reported killed by lightning. A heavy wind and hailstorm visited Mower county, Minn., at night. Several buildings were unroofed by wind at Salina, Kans. Destructive hailstorms occurred near Dodge City and Concordia, Kans. At Stilson, Iowa, 7 horses were killed by lightning, and 3 buildings were struck by lightning and burned. A heavy wind, thunder, and hailstorm visited Amana, Iowa, in the early morning. Damage was caused by hail about Pierre, S. Dak.

23d.—Thunder, wind, and rainstorms caused much damage in parts of the Ohio Valley. At Butler, Pa., streets were badly washed, and a building was struck by lightning. At Carlisle, Pa., a building was struck by lightning, and several persons injured. At Wellsville, Ohio, trees were uprooted by wind, small buildings were blown over, and damage was caused by heavy rain. At Akron, Ohio, a barn was struck by lightning and burned. Damage was done by heavy rain, lightning, and hail in other parts of Ohio. Two persons were reported killed by lightning near Greenville, Ill. At Salem, Ind., several buildings were unroofed and trees were uprooted by heavy wind.

24th.—At Albany, N. Y., several houses were struck by lightning in the evening. A violent rainstorm, with hail, visited York and Cumberland counties, Pa. A heavy thunderstorm, with hail and high wind, occurred at Parkersburgh, W. Va., in the afternoon, causing considerable damage. Heavy thunder and rainstorms visited northern Ohio. A heavy rainstorm in the mountains caused considerable damage by flood in and about Genoa, Nev.

25th.—Local storms occurred in the Atlantic coast states from Maine to North Carolina. Heavy thunderstorms, rain, and hail caused damage in parts of Maine. At Groveton, N. H., lightning struck in several places. An unusually heavy rainstorm, with high wind, was reported at Springfield, Mass. A severe thunder, wind, and hailstorm visited Danbury, Conn., in the evening. A violent thunder and hailstorm passed north of Bangall, N. Y., in a path about one mile in width. A destructive hailstorm was also reported in Franklin county, N. Y. A heavy storm was reported in Caroline county, Md. A thunderstorm, with heavy rain and high wind, occurred at Charlotte, N. C., in the afternoon. Destructive storms were reported in other parts of North Carolina. A small tornado was reported in the southeast part of Pawnee county, Kans. Heavy rain caused a washout and landslide on the Colorado Central Railroad near Idaho Springs, Clear Creek Co., Colo. At Furnace Creek, Death Valley, Cal., a violent windstorm began from the northeast at 10.40 p. m., causing a fall in temperature of 20°, and unroofing a small adobe house. Rain began 11 p. m. and continued until 1.15 a. m. of the 26th.

26th.—At Greenville, Pa., a church was struck by lightning in the morning. Damage was caused by lightning at Osborn, Ga. A thunderstorm was reported in the afternoon at Micco, Fla. A heavy gale from the southwest visited the outskirts of Wichita Falls, Tex., in the afternoon, overturning two houses, lifting others from their foundations, and injuring several persons. Violent thunder and hailstorms occurred in South Dakota. At Hot Springs, S. Dak., considerable damage was caused by hail. At Macksville, Kans., a heavy wind storm in the morning damaged buildings and wheat. A heavy thunder and hailstorm swept over Mount Pleasant, Utah.

27th.—A destructive hailstorm was reported in Kennebec and Lincoln counties, Me. A heavy rainstorm occurred at Waynesborough, Miss., in the morning, and at Greenville, Miss., on the 27–28th. During a heavy thunder and rainstorm at Little Rock, Ark., a woman was struck by lightning. A destructive rain and hailstorm occurred at Elm Creek, Nebr., in the evening.

28th.—An exceptionally heavy rainfall caused damage

about Wilmington, Del. Heavy rain and hailstorms were reported in Lancaster county, Pa., and Harford county, Md. A heavy rainstorm caused much damage at and about Council Bluffs, Iowa. At West Bend, Iowa, a hailstorm did considerable damage in a path about $\frac{1}{2}$ mile in width. An unusually severe rainstorm was reported at Helena, Ark., at night. A destructive hailstorm was reported near Ardoch, N. Dak., in the afternoon. Heavy rain in the mountains near Mount Pleasant, Utah, caused damage to bridges, etc. Flood, resulting from heavy rain in the mountains, was very destructive at Austin, Nev.

29th.—An exceptionally heavy rain and thunderstorm

visited Wicomico, Baltimore, Harford, and Cecil counties, Md., in the morning, causing damage by flood. The storm was also severe in Delaware. Damage was caused to fruit and crops near Hudson, Mich., by a hailstorm. Heavy thunder, rain, and hailstorms visited the sections about Sulphur Springs, Storm Lake, and Alta, Iowa.

30th.—Severe thunderstorms occurred over Long Island and New Jersey. At Woodbury, N. J., lightning struck in several places. Very heavy thunder and rainstorms visited Williamsport and Carlisle, Pa., in the afternoon and evening. Heavy rain about West Point, Miss., flooded a part of that town, swept away bridges, and submerged cotton fields.

INLAND NAVIGATION.

FLOODS.

At Kansas City, Mo., the stage of water in the Missouri River was 23.1 feet, 2.1 feet above the danger-line, the morning of the 1st, and the streets of Harlem, on the opposite bank of the river, and surrounding small farms were under water. The river reached its maximum height during the day, and at 5 p. m. had fallen 0.2 foot. On the 2d the river had fallen 0.4 foot at Kansas City, and by the 4th it was below the danger-line. On the 6th the river commenced to rise at Kansas City, and the morning of the 7th it was 0.7 foot below the danger-line. On the 8th it was 0.3 foot below the danger-line, and nearly stationary, and by the 9th it had commenced to fall.

At Sioux City, Iowa, the stage of water in the Missouri River was 14.6 feet the morning of the 4th, the highest point reached this season, and large quantities of logs and drift were running, causing considerable damage to the construction work of the Pacific Short Line bridge. On the 5th the river was falling steadily at Sioux City.

A report of the 6th stated that the Missouri River had formed a new channel at Doniphan Point, one mile east of the one formed the preceding week, and that a number of valuable Missouri farms were submerged. The Missouri River cut its banks and changed channel at several points south of Pierre, S. Dak., during the month.

On the 8th and 9th high water was reported in the Kanawha River, W. Va., and tributaries, and several booms were broken, letting out great quantities of logs.

The new lake in the Colorado Desert, near Salton, San Diego Co., Cal., presented no material change during the month.

Heights of rivers above low-water mark, July, 1891 (in feet and tenths).

Stations.	Danger-point on gauge.	Highest water.		Lowest water.		Monthly range.
		Date.	Height.	Date.	Height.	
<i>Red River.</i>						
Shreveport, La.	29.9	1	16.9	31	3.5	13.4
<i>Arkansas River.</i>						
Fort Smith, Ark.	22.0	31	15.2	25, 26	4.2	11.0
Little Rock, Ark.	23.0	1	16.5	27, 28	6.1	10.4
<i>Missouri River.</i>						
Fort Buford, N. Dak.		18	14.7	31	11.8	2.9
Sioux City, Iowa	18.7	4	14.6	12	11.2	3.4
Omaha, Nebr.	18.0	1, 5, 6	13.9	14, 25	11.1	2.8
Kansas City, Mo.	21.0	1	25.1	19, 26	15.1	8.0
<i>Mississippi River.</i>						
Saint Paul, Minn.	14.0	2	2.9	18	1.9	1.0
La Crosse, Wis.	13.0	1-8	4.6	30, 31	2.4	2.2
Dubuque, Iowa	16.0	9	4.9	28-31	2.3	2.6
Davenport, Iowa	15.0	9, 10	3.4	30	1.2	2.2
Keokuk, Iowa	14.0	7, 12	3.6	31	1.4	2.2
Saint Louis, Mo.	36.0	4	23.7	30	14.0	9.7
Caïro, Ill.	40.0	7	24.6	31	14.0	10.6
Memphis, Tenn.	33.0	1	19.4	31	10.9	8.5
Vicksburg, Miss.	41.0	5-8	29.4	31	17.7	11.7
New Orleans, La.	13.0	10	10.2	31	5.5	4.7
<i>Ohio River.</i>						
Parkersburgh, W. Va.	38.0	12	13.8	4	5.2	7.6
Cincinnati, Ohio	45.0	14, 15	18.2	23, 24	9.7	8.5
Louisville, Ky.	24.0	1	8.6	23, 24	5.5	3.1
<i>Cumberland River.</i>						
Nashville, Tenn.	46.0	6	5.3	30	1.7	3.6
<i>Tennessee River.</i>						
Chattanooga, Tenn.	33.0	31	5.7	18	2.7	3.0
Knoxville, Tenn.	29.0	31	2.2	7, 14, 15	1.2	1.0
<i>Monongahela River.</i>						
Pittsburg, Pa.	29.0	9	12.5	15	2.7	9.8
<i>Savannah River.</i>						
Augusta, Ga.	32.0	31	12.6	5, 6	6.4	6.2
<i>Willamette River.</i>						
Portland, Oregon.	15.0	1	11.8	31	6.7	5.1
<i>Susquehanna River.</i>						
Harrisburg, Pa.	17.0	25	4.4	17, 18, 23, 24	2.0	2.4
<i>Alabama River.</i>						
Montgomery, Ala.	48.0	11	4.8	5, 20, 23	1.5	3.3

ATMOSPHERIC ELECTRICITY.

AURORAS.

Auroras were reported as follows: 1st, East Machias, Me. 3d, Medford, Wis. 5th, South Canisteo, N. Y. 6th, Wolsey, S. Dak. 12th, Rockland, Mich. 14th, East Machias, Me. 17th, Peshtigo, Wis. 27th, East Machias, Me. 31st, Salem Corners, Pa.

THUNDERSTORMS.

Description of the more severe thunderstorms reported for the month is given under "Local storms."

Thunderstorms were reported as follows: East of the Rocky Mountains they were reported in the greatest number of states, 31, on the 28th; in 20 to 30 on the 2d to 4th, 7th, 14th to 18th, 20th to 27th, 29th, and 30th; in 10 to 19 on the 1st, 5th, 6th, 8th, 10th, 11th, 13th, 19th, and 31st; and in 9 on the 12th. There was no date for which thunderstorms were reported east of the Rocky Mountains in less than 9 states.

East of the Rocky Mountains thunderstorms were reported on the greatest number of dates, 30, in Florida; on 20 to 29 in

Arkansas, Iowa, Kansas, Louisiana, Minnesota, Mississippi, Missouri, Nebraska, New York, North Carolina, Pennsylvania, South Dakota, and Texas; on 10 to 19 in Alabama, Connecticut, Georgia, Illinois, Indiana, Maine, Maryland, Michigan, Montana, New Jersey, North Dakota, Ohio, South Carolina, Tennessee, Virginia, West Virginia, and Wisconsin; and on 1 to 9 in Delaware, District of Columbia, Indian Territory, Kentucky, Massachusetts, New Hampshire, Oklahoma Territory, Rhode Island, and Vermont. There was no state east of the Rocky Mountains in which thunderstorms were not reported on 1 or more dates.

West of the Rocky Mountains thunderstorms were reported in Arizona on the 2d, 3d, 5th, 12th, 14th to 20th, 22d, and 24th to 26th; in California on the 4th, 10th, 23d, 25th, 27th, and 29th; in Colorado on the 2d to 7th, 12th, and 14th to 31st; in Idaho on the 10th, 16th to 19th, 22d, 25th, 26th, 29th, and 30th; in Nevada on the 1st, 2d, 6th, 18th, 20th, and 22d to 31st; in New Mexico on the 3d to 8th, 10th, 13th to 16th, 19th,