

storm passed through the southern and eastern portions of this county during the night of the 8-9th. At Terre Haute, and in that vicinity, the smaller out-buildings, and nearly all fencing, were destroyed, and the growing crops badly damaged.

Bucyrus, Crawford county, Ohio: a destructive tornado occurred in this vicinity during the night of the 8-9th. Its course was in a northeasterly direction, and dwellings, barns, orchards, etc., in its path were destroyed. The damage in this county is estimated at \$50,000. At Galion and Osceola the storm was especially severe.

Caldwell, Noble county, Ohio: a violent wind and rain storm occurred at this place during the night of the 8-9th, causing great damage to the corn crop, orchards, and shade trees.

Washington Court House, Fayette county, Ohio: at about 8 p. m. on the 8th this place was almost totally destroyed by a tornado. Of forty business establishments fronting Central square, not one escaped destruction; besides these, about two hundred residences were demolished. Six persons were killed, and more than one hundred were more or less seriously injured. Washington Court House is the county seat of Fayette county. Being the centre of a rich agricultural district, with excellent railroad facilities, it has, during the last fifteen years, grown to be a business place of considerable importance. Its residents had beautified the town with tasteful dwellings, and its recently completed court house was one of the best in the state. The damage caused by the tornado is variously estimated, but it is generally considered that it will be about \$500,000.

Chambersburg, Franklin county, Pennsylvania: a severe storm passed over this place on the 9th. At Mount Alto, ten miles east, trees were uprooted or twisted off. The storm seems to have spent its force in the vicinity of Mount Alto.

Kansas City, Missouri: reports from Rich Hill, Bates county, state that a severe storm prevailed at that place during the night of the 8-9th, causing damage estimated at several thousand dollars. A brick dwelling was partly demolished and numerous out-buildings were destroyed.

Fort Reno, Indian Territory: at 1.10 a. m. on the 13th a dark, cone-shaped tornado-cloud was observed approaching this place from the northwest, the smaller end being downward and apparently within seventy-five feet of the earth. When within one mile of the station the course of the cloud changed to the eastward and it passed within one-half mile of the post. The cloud did not descend to the ground; it was preceded and accompanied by a loud, roaring sound.

Lead Hill, Boone county, Arkansas: reports from Mountain Home, Baxter county, state that during the morning of the 13th a violent storm occurred at that place. Trees were uprooted, houses unroofed, and roadways obstructed. A severe storm is also reported to have occurred on the above date at Vanndale, Cross county, causing considerable damage.

Astoria, Oregon: at about 3 p. m. on the 15th a whirlwind passed in a westerly direction near this place, twisting off small trees and carrying them into the air. At Skipanon, a few miles west of Astoria, the whirlwind left quite a marked path through the small timber. In Upper Astoria a man was injured by the falling timbers of a house which was blown down.

The following are reports of tornadoes which occurred during September, 1885, forwarded by special tornado observers, of whom there are more than 1,400.

Tippecanoe City, Miami county, Ohio: at 7 p. m., local time, on the 8th a tornado passed north of this place to a point seven miles north of Springfield, Clarke county. In its path three dwellings, a school-house, four barns, and other out-buildings were destroyed; one person was killed and five injured.

Hiram, Portage county, Ohio: at 10.15 p. m. on the 8th a tornado occurred at a point about eight miles southeast of this place. The cloud was funnel-shaped and moved in a north-northeasterly direction, its path being one and one-fourth miles long and three hundred and thirty feet in width.

Upper Sandusky, Wyandot county, Ohio: a tornado oc-

curred here at about 7 p. m. on the 8th. The cloud was funnel-shaped and moved in a northeasterly direction, its path being 1,320 feet in width. A large church, a residence (both brick structures), and a barn were destroyed.

Washington Court House, Fayette county, Ohio: at 7.30 p. m., local time, on the 8th a violent and destructive tornado occurred at this place. The tornado-cloud moved in an east-northeasterly direction, its path being about two hundred and fifty feet in width. It was about ten seconds in passing a given point. Three hundred buildings were destroyed, or badly injured. These included many business houses, four railroad depots, three churches, and the gas-works. The losses sustained are estimated at \$500,000. About one hundred persons were injured and six killed. (See report above.)

At 5 p. m., standard time, on the 8th a tornado passed from a point in the northeastern part of Hillsdale county, Michigan, to Ridgeway, Lenawee county, a distance of thirty miles, its path being from two hundred to six hundred and sixty feet in width. About fifteen buildings were destroyed, three persons injured, and much stock killed. The damage is estimated at \$30,000.

Komstad, Clay county, Dakota: a tornado occurred at this place at 8 p. m. on the 11th. There were two funnel-shaped clouds which moved in an east-southeasterly direction. Numerous out-buildings were destroyed and five persons injured.

Ord, Valley county, Nebraska: a tornado occurred at this place at 10.15 p. m. on the 11th. Its course was north-north-westerly for a distance of ten miles, the path being about six hundred and sixty feet in width. Numerous buildings were destroyed and two persons killed.

Yankton, Dakota: a tornado occurred near this place on the 11th. It moved in an easterly direction for a distance of ten miles, causing no damage, as the tornado-cloud did not extend to the earth.

Captain Samuel Hess, commanding the s. s. "Philadelphia," furnishes the following description of a tornado which occurred September 4th at Puerto Cabello, State of Carabobo, Venezuela:

September 4th, 4.32 p. m. (Greenwich mean time): A tornado, or, as the natives term it, a "caldaretta," beginning at south and ending at west, occurred at the above time; it lasted one hour, and the barometer fell during the storm 0.10 inch; terrific thunder and lightning, accompanied by heavy rain. Some slight damage was done to the vessels in port by breaking adrift from their moorings. One seaman, belonging to one of the small traders, was killed by lightning. The palm trees in the park at the entrance of the port were stripped of their foliage, and many were torn up by the roots. The path of the storm was about three hundred yards wide. The difference between the wet and dry-bulb thermometers was 1°.5.

NAVIGATION.

FLOODS.

Rio Grande City, Texas: the Rio Grande River rose rapidly on the 2d and overflowed during the night.

Leavenworth, Kansas, 7th: it has rained almost daily during the past week, the aggregate precipitation amounting to about 6.50 inches. All streams are much swollen, and many fields of low land are flooded.

Parsons, Labette county, Kansas: a very heavy rainfall occurred here during the night of the 7-8th. The creeks in this vicinity overflowed and the lowlands were flooded. This town was entirely surrounded by water, and many people living in the suburbs near Labette Creek were compelled to move out of their dwellings.

Escanaba, Michigan: the heavy rains of the 8th caused washouts on the Chicago and Northwestern railroad near Fort Howard, Wisconsin. Between that place and Duck Creek the water covered the track to a depth of four feet.

Lamar, Missouri: a remarkably heavy rainfall occurred at this place on the 8th. During the eight hours ending at 3 p. m. the rainfall amounted to more than six inches. Creeks and streams overflowed, and the crops in the surrounding country were much damaged.

Milwaukee, Wisconsin: the heavy rains of the 8th and 9th,

with the high water in the lake, flooded cellars, etc., causing considerable damage.

Tucson, Arizona: a freshet occurred at Pantano on the 9th. The railroad track was covered to a depth of several feet, and damaged.

Jackson, Hinds county, Mississippi: the rainfall of the 10th was remarkably heavy and caused considerable damage to the Yazoo railroad. Several bridges were washed away.

Galveston, Texas: the unprecedented rainfall at this place from the 15th to the 20th flooded a large part of the city. In many places the water covered the streets to a depth of more than one foot.

Vicksburg, Mississippi, 22d: the continuous rains in this section have caused great damage to the cotton crop. It is estimated that fully forty per cent. of the cotton in this section has been ruined.

Manatee, Manatee county, Florida: the very heavy rains on the 24th, 25th, and 26th washed away bridges and caused much damage to the roads in this part of the state.

Jacksonville, Florida: during the night of the 26-27th more than six inches of rain fell at this place. Dwellings and stores were flooded and railroads damaged.

Savannah, Georgia, 30th: no mails from Florida have been received during the last three days in consequence of washouts on the railroads. Reports from Brunswick, Georgia, state that twenty-five miles of the Brunswick and Western railroad, between Brunswick and Waynesville, have been washed away. From the 27th to 30th the rainfall at Savannah amounted to 5.50 inches. The damage to the rice crop in both Georgia and South Carolina has been very great. Many of the rice fields along the Savannah River have been covered with water.

STAGE OF WATER IN RIVERS.

In the following table are shown the danger-points at the various river stations; the highest and lowest stages for September, 1885, with the dates of occurrence, and the monthly ranges:

Heights of rivers above low-water mark, September, 1885. [Expressed in feet and tenths.]

Stations.	Danger-point on gauge.	Highest water.		Lowest water.		Monthly range.
		Date.	Height.	Date.	Height.	
<i>Red River:</i>						
Shreveport, Louisiana.....	29 9	11	4 2	4, 5	3 0	1 2
<i>Arkansas River:</i>						
Fort Smith, Arkansas.....	22 0	13	17 5	4, 28	4 0	13 5
Little Rock, Arkansas.....	23 0	15	17 1	7	4 8	12 3
<i>Missouri River:</i>						
Yankton, Dakota.....	24 0	2, 12, 13, 14	15 9	30	14 0	1 9
Omaha, Nebraska.....	18 0	3	8 4	30	6 6	1 8
Leavenworth, Kansas.....	20 0	1	10 2	30	7 3	3 0
<i>Mississippi River:</i>						
Saint Paul, Minnesota.....	14 5	6 to 19	3 9	6	2 9	1 0
La Crosse, Wisconsin.....	24 0	20, 21	7 2	7	4 0	2 2
Dubuque, Iowa.....	16 0	23, 24	6 7	7	4 5	2 2
Davenport, Iowa.....	15 0	15, 16, 17	5 9	7	3 9	2 0
Keokuk, Iowa.....	14 0	1	9 6	8	5 5	4 1
Saint Louis, Missouri.....	32 0	15	22 2	29, 30	13 0	9 2
Cairo, Illinois.....	40 0	17	21 4	30	13 8	7 6
Memphis, Tennessee.....	34 0	19, 20	15 0	1	9 2	5 8
Vicksburg, Mississippi.....	41 0	24, 25	21 9	4	12 0	9 9
New Orleans, Louisiana*.....	— 3 0	26	— 9 4	11	— 12 3	2 9
<i>Ohio River:</i>						
Pittsburg, Pennsylvania.....	23 0	11	6 5	30	1 6	4 9
Cincinnati, Ohio.....	50 0	1	19 2	29, 30	5 3	13 9
Louisville, Kentucky.....	25 0	2	8 2	28, 29	3 6	4 0
<i>Cumberland River:</i>						
Nashville, Tennessee.....	40 0	30	1 4	13, 19	0 4	1 0
<i>Tennessee River:</i>						
Chattanooga, Tennessee.....	33 0	22, 23, 24	2 2	20	0 7	1 5
<i>Monongahela River:</i>						
Pittsburg, Pennsylvania.....	29 0	11	6 5	30	1 6	4 9
<i>Saragook River:</i>						
Augusta, Georgia.....	32 0	22	21 6	19	4 7	16 9
<i>Mobile River:</i>						
Mobile, Alabama.....	9	16	5 30	15	5 1	0
<i>Sacramento River:</i>						
Red Bluff, California.....	24	1	0	1 to 23	0 4	0 6
Sacramento, California.....	28	8	0	1 to 26	7 3	0 7
<i>Willamette River:</i>						
Portland, Oregon.....	10, 12, 13	4	4	19	2 4	2 0
<i>Colorado River:</i>						
Yuma, Arizona.....						

* Below high-water mark of 1874 and 1883.

The observer at Chattanooga, Tennessee, reports that on the 13th the river reached a stage sufficient to permit the running of small boats, navigation having been suspended since August 25th. The lowest stage of the season occurred on the 20th.

HIGH TIDES.

Cedar Keys, Florida, 21st.
New River, Inlet, North Carolina, 10th, 11th, 27th, 28th.
Indianola, Texas, 18th.

LOW TIDE.

The following is an extract from the "New York Herald" of September 8, 1885:

QUEBEC, September 7, 1885.—The steamers Carmona, Brooklyn and Polynesian, on their way down from Montreal, scraped ground several times, the two former vessels drawing twenty-five feet two inches, and the latter a few inches less.

The steamer Grecian, which grounded at Champlain, had to be lightened in order to get off. The Gulf lighthouse keepers report that the tides have of late run from four to five feet lower than has been known for the last fifty years.

VERIFICATIONS.

The percentages of verifications of special predictions for certain localities are, as follows:

Milwaukee, Wisconsin, 82.08; Auburn, Alabama, 79.17; Jacksonville, Florida (four days), 87.50; Omaha, Nebraska, 83.17; Arkansas, 84.62; Georgia, 87.50; Tennessee, 88.46; Dallas, Texas, 92.79 (as verified by observer, 92); Rochester and Oswego, New York, 80.00; Portland, Maine, 80.83; Chambersburg and York, Pennsylvania, 94.58; Richmond, Virginia, 89.17; Meadville, Pennsylvania, 85.00 (as verified by observer, 98); Oil City, Pennsylvania, 89.17 (as verified by observer, 100); Columbus, Ohio, 78.75; Bucyrus and northern Ohio, 80.00; Albany, New York, 91.25 (as verified by observer, 88); Cincinnati, Ohio, 76.67; Buffalo, New York, 75.83; Indianapolis, Indiana, 77.50; Chicago, Illinois, 78.33; Saint Louis, Missouri, 82.08; Cairo, Illinois, 83.75; Boston, Massachusetts, and New Haven, Connecticut, 90.00; (New Haven, Connecticut, as verified by observer, 88); Louisville, Kentucky, 75.83; Detroit, Michigan, 77.08; Kansas, Indian Territory, and western Missouri, 79.17; central Illinois and western Indiana, 83.75; north-western Ohio and eastern Indiana, 82.50; Toledo, Ohio, 78.75; Memphis, Tennessee, 80.17; Shreveport, Louisiana, 81.03 (as verified by observer, 73); Cumberland, Maryland, 91.81; Hagerstown, Maryland, 90.09 (as verified by observer, 82); Lawrenceburg, Indiana, 83.19 (as verified by observer, for nineteen days, 91); Wheeling, West Virginia, 85.77 (as verified by observer, for twenty days, 87); Blanchester, Ohio, 82.33 (as verified by observer, 98); Portsmouth, Ohio, 81.90 (as verified by observer, 86); Parkersburg, West Virginia, 85.27 (as verified by observer, 83); Defiance, Ohio, 86.50 (as verified by observer, 94); District of Columbia and Baltimore, Maryland, 93.27; Cleveland, Ohio (twenty days), 79.38; Erie, Pennsylvania (twenty days), 84.38; Garrett, Indiana (nineteen days), 85.53 (as verified by observer, 100); Sandusky, Ohio (fifteen days), 83.33; Pittsburg, Pennsylvania (thirteen days), 88.46; Olney, Illinois (nine days), 95.53 (as verified by observer, 100); Mansfield, Ohio (nine days), 83.33; Connellsville, Pennsylvania (nine days), 93.06; Vincennes, Indiana (eight days), 96.88; Chillicothe, Ohio (seven days), 83.93; Somerset, Pennsylvania (three days), 75.00; Uniontown, Pennsylvania (one day), 75.00; Springfield, Missouri (one day), 100.00; New York City and Philadelphia, Pennsylvania, 93.75; (New York City, as verified by observer, for twenty-six days, 98); Colorado, 69.58; Eastman, Georgia (as verified by observer), 88; Bloomington, Illinois (as verified by observer), 89; Jessup, Georgia (as verified by observer), 100.

CAUTIONARY SIGNALS.

During September, 1885, one hundred and forty three cautionary signals were ordered. Of these, one hundred and six, or 74.13 per cent., were justified by winds of twenty-five miles or more per hour, at or within one hundred miles of the station. Thirty-four cautionary off-shore signals were ordered, of which