

mer, Mifflington, Bethlehem, Carlisle, Chambersburg, Reading, Huntington, Norristown, Easton, Columbia, Pine Grove, Harrisburg, West Chester, Pittsburg, and Erie, Pa., where trees were blown down, houses unroofed, telegraphic communication interrupted, and railroad traffic delayed. While the center of this storm passed nearly as far west as Pittsburg the damage along the New Jersey coast was much greater than might have been expected. Several branch lines of the West Jersey Railroad were washed out, telegraph wires were blown down, and many small vessels were washed ashore.

The storm in New York state began about midnight of the 13th and did little damage except in the western portion and on the Lakes. On Lake Erie, off Dunkirk, the "Dean Richmond" foundered with 18 persons. Smaller vessels were reported as being wrecked all along the coast. The total known loss on the Lakes is 13 vessels, 54 lives, and \$676,000; this is the greatest loss ever known in proportion to the number of vessels out. At Manistique, Mich., a raft of logs valued at \$50,000 was lost. At New London, Conn., the wind reached a maximum velocity of 63 miles at 2.23 a. m., the 14th, all boats from New York delayed, and Light Ship "Martha Emma" wrecked. At New Haven, Conn., the wind reached 50 miles. Telephone lines over Vermont, near Montpelier, were damaged.

In Massachusetts the storm visited North Billerica, Hadley, Mansfield, and Boston, but no greater damage done than uprooting trees. The gales attending this storm were felt as far east as Portland, Me., and west as far as Duluth, Minn., during the 15th, as the storm center passed off in the direction of Labrador.

17th.—Hail fell at Fort Buford, N. Dak., at intervals,

from noon until 2.30 p. m. Twenty miles to the southwest, in Montana, a small number of cattle were killed by lightning.

20th.—During a severe thunderstorm near Uniontown, Pa., a large mill was struck by lightning; estimated loss about \$5,000. Four sheep were killed by lightning at Tiffin, Ohio.

24th.—A heavy gale prevailed on Lakes Superior, Huron, and Erie, and stopped navigation at the Straits of Mackinac. A schooner was wrecked 7 miles from Grand Island in Lake Superior. The crew were rescued, but the vessel, valued at \$25,000, was a total loss. A number of other accidents occurred. A report from Los Angeles, Cal., states that the heavy rains of the past two days, in the San Bernardino and Santa Ana valleys have damaged raisins and grains.

28th.—Severe gales prevailed over the Lake region. On Lake Superior the gale was accompanied by a heavy fall of snow, and snow squalls marked its progress across lower Lake Michigan, upper Lake Huron, and Georgian Bay. A number of wrecks were reported.

29th.—At Palermo, N. Y., a severe storm blew down buildings.

INLAND NAVIGATION.

STAGE OF WATER IN RIVERS.

The following table shows the danger-points at the various river stations; the highest and lowest stages for the month, with the dates of occurrence; and the monthly ranges:

Heights of rivers above low-water mark, October, 1893.

Stations.	Danger-point on gauge.	Highest water.		Lowest water.		Monthly range.
		Height.	Date.	Height.	Date.	
<i>Red River.</i>	<i>Feet.</i>	<i>Feet.</i>		<i>Feet.</i>		<i>Feet.</i>
Shreveport, La.	29.2	5.4	10	—2.6	1, 2	8.0
<i>Arkansas River.</i>						
Fort Smith, Ark.	22.0	12.0	4	—1.0	25, 28-31	13.0
Little Rock, Ark.	23.0	13.0	6	3.5	29, 31	9.5
<i>Missouri River.</i>						
Fort Buford, N. Dak.	25.0	7.3	17	6.3	1, 2	1.0
Bismarck, N. Dak.	75.0	2.7	23, 30	2.1	1-4, 17, 18	0.6
Pierre, S. Dak.	13.0	—3.8	3, 7, 11-14	—4.0	5, 6, 20-27	0.2
Sioux City, Iowa.	18.7	6.1	22-31	5.5	1, 4-8	0.6
Omaha, Nebr.	18.0					
Kansas City, Mo.	21.0	7.3	5	5.4	17-19	1.9
<i>Mississippi River.</i>						
Saint Paul, Minn.	14.0	3.1	7, 8	2.7	4	0.4
La Crosse, Wis.	10.0	3.1	16	2.1	1-3	1.0
Dubuque, Iowa.	16.0	3.1	27	2.0	1, 2	1.1
Davenport, Iowa.	15.0	2.0	29	1.2	1-4	0.8
Keokuk, Iowa.	14.0	1.4	11, 19, 24-26	0.7	1	0.7
Hannibal, Mo.	17.0	1.9	23-26, 31	1.3	1, 2	0.6
Saint Louis, Mo.	30.0	4.2	7, 11-13	3.3	31	0.9
Cairo, Ill.	40.0	10.3	26	5.0	6-8, 22	5.3
Memphis, Tenn.	33.0	5.8	28	2.7	9, 10, 24	3.1
Vicksburg, Miss.	41.0	4.0	11	0.3	29	3.7
New Orleans, La.	13.0	4.9	2	2.8	26	2.1
<i>Ohio River.</i>						
Parkersburg, W. Va.	38.0	9.0	15	1.2	1, 2, 13	7.8
Cincinnati, Ohio.	45.0	19.5	18	5.0	3	14.5
Louisville, Ky.	24.0	8.0	20	3.0	1	5.0
<i>Cumberland River.</i>						
Nashville, Tenn.	40.0	3.2	14	0.8	31	2.4
<i>Tennessee River.</i>						
Chattanooga, Tenn.	33.0	9.6	17	1.7	16	7.9
Knoxville, Tenn.	29.0					
<i>Monongahela River.</i>						
Pittsburg, Pa.	22.0	6.8	16	5.3	20	1.5
<i>Savannah River.</i>						
Augusta, Ga.	32.6	18.8	14	6.0	31	12.8

Heights of rivers—Continued.

Stations.	Danger-point on gauge.	Highest water.		Lowest water.		Monthly range.
		Height.	Date.	Height.	Date.	
<i>Willamette River.</i>	<i>Feet.</i>	<i>Feet.</i>		<i>Feet.</i>		<i>Feet.</i>
Portland, Oregon.	15.0	9.8	9, 10, 12	2.0	3	7.8
<i>Susquehanna River.</i>						
Harrisburg, Pa.	17.0	5.3	16	1.2	13	4.1
<i>Alabama River.</i>						
Montgomery, Ala.	48.0	3.9	5	0.1	31	3.8
<i>James River.</i>						
Lynchburg, Va.	18.0	7.3	15	0.8	1, 2	6.5
<i>Sacramento River.</i>						
Red Bluff, Cal.	22.0					
Sacramento, Cal.	25.0	8.5	13	7.7	6-9, 30, 31	0.8
<i>Des Moines River.</i>						
Des Moines, Iowa.	19.0	3.2	27-31	2.7	9-24	0.5

FLOODS.

The column giving the highest stages of water during October shows that none of the rivers there mentioned rose to the danger point during this month; the following reports as to other rivers have been received:

New Mexico.—The Hondo River rose on the 5th and 6th 8 feet higher than was ever known before, and considerable damage was done.

South Carolina.—The Wateree River rose from the 22d-24th, reaching 31 feet at Camden bridge, being the highest rise since 1886.

Virginia.—On the 15th and again on the 23d the James River overflowed its banks at Irwin.

CLOSING OF NAVIGATION.

Lakes and rivers continued open to navigation during October, excepting local interruptions, due to low water in the upper Missouri and Mississippi rivers.

ATMOSPHERIC ELECTRICITY.

THUNDERSTORMS AND AURORAS.

The following table shows in detail for October, 1893, (1) the number of stations from which meteorological reports

were received; (2) the number of such stations reporting thunderstorms (T) and auroras (A), respectively, in each state and on each day of the month on which the phenomena were observed: