

Rhode Island.—2d.
South Carolina.—Spartanburg, 3d, 4th, 27th, 28th, 30th, 31st; Pacolet, 3d, 28th to 29th, 30th; Stateburg, 28th, 29th, 30th.
Tennessee.—Milan, 2d, 3d, 4th, 16th, 28th to 30th; Memphis, 2d, 3d, 27th to 31st; Nashville, 2d, 16th, 22d, 28th, 30th, 31st; Chattanooga, 28th to 31st; Knoxville, 30th, 31st.
Texas.—Cleburne, 1st, 27th; Silver Falls, 16th; Fort Elliott, 26th, 27th; Corsicana, 27th; Palestine, 27th, 28th, 29th.
Utah.—11th, 12th, 13th, 19th, 20th, 23d, 24th, 25th.
Vermont.—2d to 9th, 16th, 17th, 19th, 20th, 22d, 24th.
Virginia.—1st to 6th, 17th, 22d, 23d, 27th, 29th, 30th.
Washington Territory.—9th to 12th, 20th to 26th, 29th, 31st.
West Virginia.—1st to 5th, 16th, 17th, 19th, 22d, 23d, 30th, 31st.
Wisconsin.—1st to 5th, 15th to 21st, 26th to 31st.
Wyoming.—26th.

ICE.

The formation of ice in the southern parts of the country occurred on the following dates:

Arkansas.—Lead Hill, 28th, 31st.
California.—Salinas, 31st.
Kansas.—Manhattan, 1st, 27th; Salina, 25th.
Maryland.—Fallston, 17th.
Missouri.—Oregon, 1st.
North Carolina.—Reidsville, 2d.
Texas.—Silver Falls, 1st.

TEMPERATURE OF WATER.

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

Temperature of water for October, 1886.

Station.	Temperature at bottom.		Range.	Average depth, feet and tenths.	Mean temperature of the air at station.
	Max.	Min.			
Alpena, Michigan.....	57.1	45.3	11.8	11.7	48.1
Augusta, Georgia.....	77.0	59.5	17.5	5.7	61.7
Baltimore, Maryland.....	71.5	59.6	11.9	11.5	58.6
Block Island, Rhode Island.....	62.7	55.0	7.7	8.9	54.8
Boston, Massachusetts.....	56.1	49.2	6.9	23.5	51.5
Buffalo, New York.....	61.9	52.5	9.4	13.9	52.0
Canby Fort, Washington Territory.....	57.9	50.6	7.3	14.2	52.4
Cedar Keys, Florida.....	80.8	67.7	13.1	7.6	71.2
Charleston, South Carolina.....	79.4	64.9	14.5	37.6	66.5
Chicago, Illinois.....	60.4	47.3	13.1	8.4	56.6
Chincoteague, Virginia.....	73.6	58.0	15.6	3.9	61.0
Cleveland, Ohio.....	66.8	52.8	14.0	13.5	53.9
Detroit, Michigan.....	61.5	48.7	12.8	27.7	54.8
Duluth, Minnesota.....	48.7	42.1	6.6	10.5	46.9
Escanaba, Michigan.....	53.6	49.0	4.6	18.9	48.2
Galveston, Texas.....	77.3	65.6	11.7	15.2	71.6
Grand Haven, Michigan.....	63.0	48.7	14.3	18.4	52.3
Jacksonville, Florida.....	83.7	68.0	15.7	18.0	68.9
Key West, Florida.....	84.7	74.7	10.0	18.7	78.3
Mackinaw City, Michigan.....	56.8	49.0	7.8	10.0	50.3
Macon, Fort, North Carolina.....	78.3	65.6	12.7	14.2	64.8
Marquette, Michigan.....	57.7	47.1	10.6	12.0	50.3
Mobile, Alabama.....	80.0	69.0	11.0	17.1	64.7
New London, Connecticut.....	64.6	56.3	8.3	12.8	53.4
New York City.....	68.8	57.2	11.6	15.1	56.5
Norfolk, Virginia.....	73.7	60.3	13.4	16.6	61.3
Pensacola, Florida.....	76.3	66.2	10.1	17.9	69.0
Portland, Maine.....	55.9	47.5	8.4	17.5	47.9
Portland, Oregon.....	60.8	47.9	12.9	48.8	51.4
Sandusky, Ohio.....	63.0	49.1	13.9	10.3	54.0
Sandy Hook, New Jersey*.....	68.2	58.0	10.2	13.3	57.4
San Francisco, California.....	58.3	55.9	2.4	38.8	57.1
Savannah, Georgia.....	78.7	63.1	15.6	11.0	60.2
Smithville, North Carolina.....	79.2	65.0	14.2	10.4	63.5
Toledo, Ohio.....	65.2	48.7	16.5	12.9	53.4
Wilmington, North Carolina.....					

* Record for first 21 days of month. † Observations temporarily suspended.

PRECIPITATION.

[Expressed in inches and hundredths.]

The distribution of rainfall over the United States and Canada for October, 1886, as determined from the reports of about seven hundred stations, is exhibited on chart iii.

Owing to the unusually small amount of precipitation dur-

ing the month, a shading to represent from one to two inches is used; usually, areas of less than two inches of precipitation are not shaded.

The precipitation of the month is largely below the normal in nearly every district of the United States, the only exceptions being the northern and middle portions of the Rocky Mountain region, the middle Pacific coast, northern Texas, and the western portion of the Indian Territory; in these districts the rainfall of the month is considerably above the normal. In Arizona and along the southern Pacific coast it is about normal, or only slightly above. Although the whole of the Mississippi Valley and all the country lying to the eastward is largely below the normal the greatest departures occur in the south Atlantic states, Gulf States, and Ohio Valley; within this large area one station only, Sanford, Florida, reports an excess of rainfall. The normal rainfall of the south Atlantic states for October, as deduced from the Signal Service observations of the past thirteen years, is 4.30, while the average for these states during October, 1886, is only .69, less than one-sixth of the normal; in the eastern Gulf states the deficiency is even greater; the normal for these states is 3.30, while the average of the Signal Service records of the present month within this area is only .36, about one-ninth of the normal quantity. The only stations east of the one-hundredth meridian at which an excess of rain fell are, Dubuque, Iowa, excess .95; Mackinaw City, Michigan, .22; Portland, Maine, 3.09; New York City, .58; Sandy Hook, New Jersey, 3.30; Atlantic City, New Jersey, 5.34; Sanford, Florida, 2.46.

The following are some of the most marked departures from the normal precipitation at Signal Service stations:

Above normal.		Below normal.	
Inches.		Inches.	
Atlantic City, New Jersey.....	5.34	Hatteras, North Carolina.....	6.01
Fort Sill, Indian Territory.....	4.73	Charleston, South Carolina.....	4.89
Sandy Hook, New Jersey.....	3.30	Brownsville, Texas.....	4.50
Portland, Maine.....	3.09	Smithville, North Carolina.....	4.29
Sanford, Florida.....	2.46	Springfield, Illinois.....	3.80
Winnemucca, Nevada.....	1.17	Pensacola, Florida.....	3.76
Yuma, Arizona.....	1.07	Jacksonville, Florida.....	3.76
Dubuque, Iowa.....	0.95	Wilmington, North Carolina.....	3.61
Fort Thomas, Arizona.....	0.82	Galveston, Texas.....	3.58
Fort Custer, Montana.....	0.75	Mobile, Alabama.....	3.53

In the following table are shown, for the several geographical districts, the normal precipitation for October; the average for October, 1886, and the excess or deficiency as compared with the normal:

Average precipitation for October.

Districts.	Average for Oct., Signal-Service observations.		Comparison of Oct., 1886, with the average for several years.
	For several years.	For 1886.	
	Inches.	Inches.	Inches.
New England.....	4.23	3.88	- 0.35
Middle Atlantic States.....	3.25	2.78	- 0.47
South Atlantic States.....	4.30	0.69	- 3.61
Florida Peninsula.....	5.42	4.27	- 1.15
Eastern Gulf States.....	3.30	0.36	- 2.94
Western Gulf States.....	3.73	1.44	- 2.29
Rio Grande Valley.....	3.71	0.34	- 3.37
Tennessee.....	3.35	0.81	- 2.54
Ohio Valley.....	3.20	0.88	- 2.32
Lower lake region.....	3.37	1.52	- 1.85
Upper lake region.....	3.56	2.23	- 1.33
Extreme northwest.....	1.85	1.46	- 0.39
Upper Mississippi Valley.....	3.38	1.70	- 1.68
Missouri Valley.....	2.58	1.18	- 1.40
Northern slope.....	1.09	0.84	- 0.25
Middle slope.....	1.44	1.11	- 0.33
Southern slope.....	2.26	3.90	+ 1.64
Southern plateau.....	0.76	0.77	+ 0.01
Middle plateau.....	1.13	1.85	+ 0.72
North Pacific coast region.....	4.19	3.48	- 0.71
Middle Pacific coast region.....	1.14	1.31	+ 0.17
South Pacific coast region.....	0.36	0.39	+ 0.03

DEVIATIONS FROM AVERAGE PRECIPITATION.

The following table shows, for certain stations, as reported by voluntary observers, the average precipitation for the month

of October for a series of years, the precipitation for October, 1886, and the departures from the average:

Station.	County.	Average precipitation for October.	Number of years.	Precipitation for October, 1886.	Departure.
		Inches.		Inches.	Inches.
<i>Arkansas.</i>					
Lead Hill.....	Boone.....	6.74	5	0.10	- 6.64
<i>California.</i>					
Sacramento.....	Sacramento.....	0.77	20	0.79	+ 0.02
<i>Connecticut.</i>					
Canton *.....	Hartford.....	4.99	25	2.70	- 2.29
Middletown *.....	Middlesex.....	3.88	28	3.31	- 0.57
New Haven *.....	New Haven.....	3.80	14	1.95	- 1.85
Wallingford *.....	New Haven.....	4.00	28	2.73	- 1.27
<i>Dakota.</i>					
Webster.....	Day.....	5.03	4	1.77	- 3.26
<i>Florida.</i>					
Archer.....	Alachua.....	2.01	4	2.11	+ 0.10
<i>Illinois.</i>					
Anna.....	Union.....	3.99	11	0.74	- 3.25
Collinsville.....	Madison.....	3.05	6	0.78	- 2.27
Mattoon.....	Colos.....	5.33	6	1.05	- 4.28
Peoria.....	Peoria.....	2.71	30	1.81	- 0.90
Riley.....	McHenry.....	2.61	26	2.55	- 0.06
Sandwich.....	De Kalb.....	3.25	35	1.65	- 1.60
Sycamore.....	De Kalb.....	3.95	6	2.26	- 1.69
<i>Indiana.</i>					
Lafayette.....	Tippecanoe.....	3.00	7	0.73	- 2.27
Logansport.....	Cass.....	2.73	31	1.30	- 1.43
Spiceland.....	Henry.....	2.27	27	1.00	- 1.27
Vevay.....	Switzerland.....	2.65	21	0.91	- 1.74
<i>Iowa.</i>					
Cresco.....	Howard.....	2.56	14	1.72	- 0.84
Monticello.....	Jones.....	2.94	33	5.34	+ 2.40
<i>Kansas.</i>					
Independence.....	Montgomery.....	3.11	14	1.02	- 2.09
Wellington.....	Sumner.....	2.83	8	1.29	- 1.54
<i>Maine.</i>					
Cornish.....	York.....	4.32	29	5.10	+ 0.78
Orono *.....	Penobscot.....	4.50	18	1.42	- 3.08
<i>Maryland.</i>					
Fallston.....	Hartford.....	3.46	10	2.24	- 1.22
<i>Massachusetts.</i>					
Amherst *.....	Hampshire.....	3.77	52	3.06	- 0.71
Cambridge *.....	Middlesex.....	3.39	46	2.72	- 0.67
Chestnut Hill *.....	Middlesex.....	3.77	11	3.21	- 0.56
Framingham *.....	Middlesex.....	3.94	12	3.49	- 0.45
Lake Cochituate *.....	Middlesex.....	4.17	35	3.16	- 1.01
Lowell *.....	Middlesex.....	3.07	61	2.64	- 0.43
Mystic Lake *.....	Middlesex.....	3.48	11	2.98	- 0.50
Now Bedford *.....	Bristol.....	3.81	74	4.23	+ 0.42
Somerset.....	Bristol.....	3.85	16	3.82	- 0.03
Springfield *.....	Hampden.....	4.17	39	3.46	- 0.71
Taunton *.....	Bristol.....	3.58	12	3.02	- 0.56
Waltham *.....	Middlesex.....	3.67	62	3.19	- 0.48
Williamstown *.....	Berkshire.....	2.82	19	2.60	- 0.22
<i>Nevada.</i>					
Carson City.....	Ormsby.....	0.45	8	0.21	- 0.24
<i>New Brunswick.</i>					
Saint John *.....	Saint John.....	4.63	26	4.90	+ 0.27
<i>New Hampshire.</i>					
Concord *.....	Merrimac.....	3.87	31	2.63	- 1.24
Hanover *.....	Grafton.....	2.27	22	2.45	+ 0.18
<i>New Jersey.</i>					
South Orange.....	Essex.....	3.48	17	2.40	- 1.08
<i>New York.</i>					
Palermo.....	Oswego.....	3.48	33	1.85	- 1.63
<i>Ohio.</i>					
Wauseon.....	Fulton.....	3.02	14	1.94	- 1.08
Westerville.....	Franklin.....	2.43	12	1.33	- 1.10
<i>Pennsylvania.</i>					
Dyberry.....	Wayne.....	3.17	16	2.42	- 0.75
Gramplan Hills.....	Clearfield.....	3.02	15	0.97	- 2.05
<i>South Carolina.</i>					
Stateburg.....	Sumter.....	2.23	6	2.02	- 0.21
<i>Texas.</i>					
New Ulm.....	Austin.....	4.13	15	0.92	- 3.21
<i>Vermont.</i>					
Lunenburg *.....	Essex.....	3.55	39	1.40	- 2.15
Nowport *.....	Orleans.....	4.11	11	2.20	- 1.91
Strafford.....	Orange.....	3.21	12	2.03	- 1.18
<i>Virginia.</i>					
Bird's Nest.....	Northampton.....	3.26	18	2.05	- 1.21
Dale Enterprise.....	Rockingham.....	2.05	6	2.54	+ 0.49
Variety Mills.....	Nelson.....	3.54	8	1.97	- 2.47
Wytheville.....	Wythe.....	2.93	22	0.87	- 2.06
<i>West Virginia.</i>					
Helvetia.....	Randolph.....	3.45	10	1.35	- 2.10

* From the "Bulletin of the New England Meteorological Society."

The following notes, in connection with this subject, are furnished by voluntary observers:

- Illinois.*—Sandwich, De Kalb county: the largest October rainfall during the past thirty-five years, 7.65, occurred in 1882; the least, 0.19, in 1877.
- Mattoon, Coles county: the greatest October precipitation during the past six years, 11.25, occurred in 1881; the least, 1.06, in 1886.
- Riley, McHenry county: the precipitation of October, 1881, 6.81, is the greatest, and that of October, 1872, 0.62, the least, that has fallen in October during the past twenty-six years.
- Sycamore, De Kalb county: the greatest October precipitation during the past six years, 8.20, occurred in 1881; the least, 2.26, in 1886.
- Indiana.*—Logansport, Cass county: during the past thirty-one years the

greatest monthly precipitation for October, 6.98, occurred in 1877; the least, 1.10, in 1874.

Vevay, Switzerland county: during the past twenty-one years the greatest monthly precipitation for October, 7.67, fell in 1883; the least, 0.28, in 1879.

Iowa.—Monticello, Jones county: during the past thirty-three years the greatest monthly precipitation for October, 7.21, occurred in 1881; the least, 0.43, in 1872.

Kansas.—Independence, Montgomery county: the total precipitation of the ten months of the current year ending October 31st, 23.20, is 10.36 below the average for the same months during the past fourteen years.

Maryland.—Fallston, Hartford county: during the last sixteen Octobers the greatest precipitation, 7.70, occurred in 1873; the least, 0.23, in 1874.

New York.—Palermo, Oswego county: during the past thirty-three years the greatest monthly precipitation for October, 7.90, fell in 1862; the least, 0.30, in 1882.

Ohio.—Westerville, Franklin county: during the past twelve years the greatest monthly precipitation for October, 4.59, fell in 1881; the least, 0.56, in 1879.

Wauseon, Fulton county: the total precipitation for the ten months of the current year ending October 31st, 24.65, is 7.18 less than the normal for the same months as deduced from the observations of the past fourteen years; the largest October precipitation during that time, 8.92, occurred in 1881; the smallest, 0.93, in 1874.

Texas.—New Ulm, Austin county: during the past fifteen years the greatest monthly precipitation for October, 12.44, occurred in 1881; the least, 0.79, in 1874.

Vermont.—Strafford, Orange county: during the past twelve years the greatest monthly precipitation for October, 5.90, occurred in 1885; the least, 1.20, in 1882.

Virginia.—Dale Enterprise, Rockingham county: during the past six years the greatest monthly precipitation for October, 12.60, fell in 1885; the least, 0.96, in 1884.

Variety Mills, Nelson county: the largest October precipitation during the past eight years, 10.76, fell in 1885; the least, 0.96, in 1884.

Wytheville, Wythe county: the total precipitation of the ten months ending October 31st, 38.43, is 2.40 above the normal of the same months as deduced from the observations of the past twenty-two years.

Table of excessive and greatest monthly precipitation for October, 1886.

Station.	Specially heavy.		Largest monthly.	Station.	Specially heavy.		Largest monthly.
	Date.	Amt.			Date.	Amt.	
<i>Arkansas.</i>				<i>Michigan—Con.</i>			
Texarkana.....	13	2.34		Pontwater.....	14	2.20	
<i>Connecticut.</i>				<i>Missouri.</i>			
New London.....	7	2.00		Oregon.....	21, 22	4.35	
<i>Florida.</i>				<i>Nebraska.</i>			
Sanford.....	9, 10, 11	3.61	8.75	Brownville.....	22	2.87	
Maunabo.....	9, 10	2.75		<i>New Hampshire.</i>			
Alva.....				Antrim.....	27	2.00	
<i>Illinois.</i>				<i>New Jersey.</i>			
Rockford.....	13, 14	3.48		Atlantic City.....	30	6.02	8.16
Stephenson.....	14	2.50		Sandy Hook.....	27	3.88	6.70
Knox.....	14	2.00		<i>New York.</i>			
<i>Indian Territory.</i>				New York City.....	26, 27	3.90	
Fort Sill.....			7.10	Brooklyn.....	26, 27	3.48	
Fort Reno.....	20, 21	2.90		Setankut.....	27	2.36	
<i>Iowa.</i>				<i>Oregon.</i>			
Manchester.....	13, 14	6.70	8.15	Bandon.....	14	2.65	
Urbana.....	12	2.65		<i>South Carolina.</i>			
Clinton.....	13, 14	3.50		Stateburg.....	26, 27	2.02	
Monticello.....	13, 14	2.75		<i>Texas.</i>			
Do.....	22, 23	2.59		Sour Lake.....	9	2.24	9.45
Cedar Rapids.....	13, 14	3.59		Do.....	13	6.80	
Cedar Rapids.....	13, 14	3.15		<i>Washington Ter.</i>			
Independence.....	13, 14	2.00		Tatoosh Island.....	14, 15	2.57	7.81
<i>Maine.</i>				<i>Wisconsin.</i>			
Portland.....	30	4.74	6.70	Enibarras.....	11	2.35	
Kent's Hill.....	31	2.62		Do.....	13, 14	2.50	
Cornish.....	31	3.41		Wausau.....	12	2.22	
<i>Massachusetts.</i>				Pralrie du Chien.....	13, 14	3.12	
North Truro.....	27, 28	3.04		Green Bay.....	13, 14	2.82	
<i>Michigan.</i>							
Fort Brady.....	14	2.22					

SNOW.

Snow fell in the various states and territories, as follows:

- Arizona.*—Prescott, 11th, 12th.
- California.*—Fort Bidwell, 5th, 9th, 11th, 30th; Susanville, 30th.
- Colorado.*—Pike's Peak, 4th to 9th, 11th, 12th, 16th, 21st, 22d, 28th.
- Dakota.*—Fort Meade, 13th; Fort Buford, 15th; Bismarck, 15th, 19th; Fort Totten, 19th, 20th; Richardton, 19th, 21st; Webster, 21st; Fort Sisseton, Deadwood, and Fort Yates, 24th.
- Illinois.*—Charleston, 28th.
- Indiana.*—Fort Wayne, 27th; Spiceland, 27th, 28th.
- Maine.*—Portland, 16th.

Massachusetts.—Princeton, 16th.
Michigan.—Lansing, 1st; Alpena, 1st, 5th, 25th; Mackinaw City, 1st, 15th, 16th, 17th; Escanaba, 15th, 16th, 17th; Thornville, 17th; Marquette, 15th, 25th.
Minnesota.—Duluth and Saint Vincent, 16th.
Montana.—Helena, 9th, 10th, 15th, 23d, 29th; Fort Maginnis, 10th, 14th, 15th, 23d, 24th, 29th; Fort Shaw, 14th, 15th, 16th, 18th, 23d, 24th; Fort Benton, 14th to 17th; Fort Assinaboine, 14th, 25th; Poplar River, 15th; Fort Custer, 19th, 24th.
Nevada.—Fort Halleck, 9th, 10th, 11th, 18th, 19th, 20th, 30th, 31st; Winnemucca, 10th, 11th, 31st; Fort McDermit, 10th, 12th, 14th.
New Hampshire.—Mount Washington, 1st, 2d, 16th, 17th, 18th, 27th, 31st; Berlin Mills, 2d, 26th.
New York.—North Volney, 1st, 2d, 17th; Buffalo, 1st, 15th, 16th; Ithaca, 16th; Le Roy, 16th, 26th; Rochester, Oswego, and Madison Barracks, 17th.
Ohio.—Elyria, 1st; Cincinnati, Wauseon, and North Lewisburg, 27th; Columbus, 27th, 28th; Napoleon and Tiffin, 28th.
Oregon.—Fort Klamath, 8th, 9th, 15th, 16th; Lakeview, 10th, 18th, 29th; Linkville, 15th, 16th, 29th, 30th.
Utah.—Frisco, 10th, 11th, 12th, 18th, 19th, 21st, 22d; Salt Lake City, 10th, 19th.
Vermont.—Burlington, 16th; Newport, 16th, 17th; Charlotte, 17th.
Wyoming.—Fort Bridger, 11th, 18th, 19th, 22d, 31st.

MONTHLY SNOWFALLS.

[Expressed in inches and tenths.]

The following stations report monthly snowfalls of one inch or more:

California.—Summit, 31; Emigrant Gap, 15; Cisco, 14.5; Truckee, 8.5; Boca, 7; Fort Bidwell, 1.
Colorado.—Pike's Peak, 7.8.
Dakota.—Richardton, 2.2.
Indiana.—Farmland, 6.2; Spiceland and Mauzy, 6; Sunman, 4; Richmond, 3.5; Marion, 1.
Michigan.—Marquette, 1.
Montana.—Fort Shaw, 4.3; Fort Assinaboine, 4; Fort Benton, 2.7; Helena, 1.1.
Nevada.—Otego, 12; Toano, 5.8; Wadsworth, 5; Palisade, 4; Carlin, 3.5; Battle Mountain, 2.2; Elko, Winnemucca, and Hot Springs, 2; Carson City, 1.5.
New Hampshire.—Mount Washington, 4.4.
Ohio.—West Milton, 4.5; North Lewisburg, 3; Yellow Springs and College Hill, 1.
Oregon.—Lakeview, 5.
Utah.—Ogden, 5; Frisco, 2; Salt Lake City, 1.9.
Wyoming.—Fort Bridger, 3.3.

DEPTH OF UNMELTED SNOW ON GROUND AT END OF MONTH.

[Expressed in inches and tenths.]

Colorado.—Pike's Peak, 1.8.
Wyoming.—Fort Bridger, 2.3.

HAIL.

Yuma, Arizona: at 10.30 a. m. of the 3d a thunder-storm, with high wind and hail, set in. Hail fell from 10.58 to 11.05 a. m.; the stones were large and consisted of pressed snow, covered with a thick coat of clear ice. Maximum velocity of the wind during the storm, thirty miles per hour from the east.

Red Bluff, California: on the 16th heavy rain, with violent thunder and lightning, began at 8 p. m. Hail-stones, varying from one-fourth to an inch in diameter, fell to a depth of three inches, breaking many windows and damaging young orange, lemon, almond, and other fruit trees, vines, and plants. This hail storm was more violent than any that has occurred here for several years.

Tatoosh Island, Washington Territory: a thunder-storm, with heavy rain, set in at 6 a. m. of the 28th; rain, with hail squalls at intervals, continued until 10.20 p. m. Between 1 and 1.10 p. m. a heavy fall of hail occurred, the stones consisted of solid ice one-third of an inch in diameter.

Hail also fell in the various states and territories on the following dates:

California.—San Francisco, 16th; Susanville, 26th, 30th.
Illinois.—Windsor, 20th.
Kansas.—Wyandotte, 23d.
Maine.—Gardiner, 27th.
Massachusetts.—Boston and Amherst, 30th.
Michigan.—Pentwater, 17th.
Nebraska.—Genoa, 22d.
New Jersey.—Atlantic City, 30th.
New Mexico.—Fort Bayard, 3d.
New York.—Rochester and Palmyra, 1st; Factoryville and North Volney, 15th; Auburn, 17th.
Ohio.—Elyria, 1st.
Oregon.—Astoria, 28th; Albany, 31st.
Texas.—Silver Falls, 7th.
Virginia.—Rappahannock, 26th.
Washington Territory.—Walla Walla, 18th; Bainbridge Island, 20th; Fort Canby, 28th.

SLEET.

Sleet occurred in the various states and territories, as follows:

Dakota.—Fort Buford, 19th.
Michigan.—Grand Haven, 1st.
Nevada.—Winnemucca, 18th.
New York.—Oswego, 1st, 2d, 15th.
Ohio.—Garrettsville, 1st; Wauseon, 27th.
Pennsylvania.—Erie, 1st.
Texas.—Silver Falls, 28th.
Vermont.—Burlington, 2d.

RAIN FROM CLOUDLESS SKY.

The following is from the "Charlotte Chronicle" of October 21, 1886, published in Charlotte, North Carolina:

Citizens in the southeastern portion of the city have witnessed for three weeks or more a very strange phenomenon, and it is to the effect that every afternoon at 3 o'clock there is a rainfall in one particular spot, which lasts for half an hour. Between two trees at the hour named there falls a gentle rain while the sun is shining, and this has been witnessed every day during the past three weeks by the people in the neighborhood.

The Signal Service observer at Charlotte makes the following statement in regard to the phenomenon:

An unusual phenomenon was witnessed on the 21st; having been informed that for some weeks prior to date rain had been falling daily after 3 p. m. on a particular spot near two trees, corner of 9th and D streets, I visited the place and saw precipitation in the form of rain drops at 4.47 and 4.55 p. m., while the sun was shining brightly. On the 22d I again visited the place and from 4.05 to 4.25 p. m. a light shower of rain fell from a cloudless sky. The two trees referred to are red oaks, with limbs trimmed to within a few feet of the trunks, and are surrounded by many more of the same kind; they stand four or five feet apart and one hundred yards from the summit of a knoll at the base of which is a small ravine. Sometimes the precipitation falls over an area of half an acre but always appears to centre at these two trees and, when lightest, occurs there only.

WINDS.

The most frequent directions of the wind during October, 1886, are shown on chart ii by the arrows flying with the wind; they are also given in the table of miscellaneous meteorological data. In New England, the middle and south Atlantic states, and in Florida they were generally from the north; in the Lake region, extreme northwest, and in the Missouri and upper Mississippi valleys they were mostly from the south or southwest; in the middle and southern Pacific coast regions they were generally westerly; in other portions of the country they were variable.

HIGH WINDS.

[In miles per hour.]

Wind-velocities of fifty or more miles per hour were recorded during the month, as follows:

Mount Washington, New Hampshire, 76, sw., 1st; 60, w., 2d; 57, w., 4th; 50, nw., 5th; 70, w., 8th; 70, w., 9th; 50, w., 11th; 70, w., 12th; 60, s., 14th; 80, w. and nw., 15th; 78, nw., 16th; 50, sw., 20th; 80, sw., 21st; 89, w., 22d; 76, nw., 23d; 61, w., 25th.