

FROSTS.

Frosts occurred during August as follows:
 1st and 2d.—Philipsburg, Pa.
 4th.—Humphrey, N. Y.
 7th.—Mount Washington, N. H.
 8th.—Hanover and Mount Washington, N. H.; Nyack, N. Y.; Fort Klamath, Oregon; Dyberry and Wellsborough, Pa.; Northfield, Vt.
 12th.—Lunenburg, Vt.
 13th.—Mount Washington, N. H.; Lunenburg, Vt.
 14th.—Carson City, Nev.; Mount Washington, N. H.; Lunenburg, Vt.
 17th.—Mount Washington, N. H.
 18th.—Saint Vincent, Minn.; Fort Klamath, Oregon.
 19th.—Cresco, Iowa; Alma and East Tawas, Mich.; Carson City, Nev.
 20th.—Fort Klamath, Oregon.
 21st.—Lebanon Springs, N. Y.
 22d.—Fort Randall, Dak.
 23d.—Fort Totten, Fort Randall, and Richardton, Dak.; Oskaloosa, Iowa; Rochester, Minn.
 24th.—Bismarck, Fort Totten, Fort Yates, and Webster, Dak.; Oneida and Sycamore, Ill.; Bancroft, Cedar Rapids, Cresco, Dubuque, Independence, Monticello, and Muscatine, Iowa; Calumet, Central Mine, Harrisville, Marshall, Saranac, and Hudson, Mich.; Brainerd, Canby, Grand Meadow, Litchfield, Moorhead, Morris, Northfield, Pine River Dam, and Sherburne, Minn.
 25th.—Alma, Central Mine, Agricultural College, East Tawas, Gaylord, Grand Rapids, Greenville, Hastings, Hudson, Harrisville, Newaygo, Lansing, Saint Johns, and Swartz Creek, Mich.; Delano, Grand Meadow, Litchfield, Moorhead, Park Rapids, Pokegama Falls Dam, and Princeton, Minn.; Wauseon, Ohio.
 26th.—Baraga, Central Mine, Harrisville, and Hudson, Mich.; Brainerd, Minn.; Carson City, Nev.; Middlebrook, W. Va.
 27th.—Pokegama Falls Dam, Minn.; Beverly, N. J.; Lebanon Springs, Ithaca, and Factoryville, N. Y.; Dyberry, Quakertown, and Wellsborough, Pa.
 28th.—Baraga, Ewart, Hart, Lansing, Mount Morris, Saint Johns, Swartz Creek, Thornville, and Valley Centre, Mich.; Concord, N. H.; New Comerstown, Sidney, and Wauseon, Ohio; Dyberry, Grampian Hills, and Wellsborough, Pa.; Northfield, Vt.
 29th.—Swartz Creek and Valley Centre, Mich.; Mount Washington, N. H.; Lebanon Springs, N. Y.; Greenville, Hudson, New Comerstown, Napoleon, Sidney, Wauseon, and

Weymouth, Ohio; Lakeview and Fort Klamath, Oregon; Grampian Hills and Wellsborough, Pa.; Northfield, Vt.
 30th.—Mount Washington, N. H.; Swartz Creek, Valley Centre, and Wixom, Mich.; New Comerstown and Weymouth, Ohio; Lakeview and Fort Klamath, Oregon.
 31st.—Wixom, Mich.; Mount Washington, N. H.; Dyberry, Pa.

The following reports of injury to vegetation by frost have been received:

Saint Vincent, Minn.: the first severe frost of this season occurred on the morning of the 24th; the damage done to wheat, oats, barley, and corn, was very light; all kinds of garden produce, however, were severely nipped; a heavy frost occurred also on the 25th.

Mr. A. T. Smith, of Altamahaw, Alamance Co., N. C., reports that the first frost of the season occurred on the 30th, slightly injuring tomatoes and tender vegetables.

Linkville, Oregon: very heavy frost occurred on the 30th and 31st, causing great injury to crops.

East Tawas, Mich.: a heavy frost occurred on the 19th, doing considerable damage to vines.

ICE.

Ice formed at Winnemucca, Nev., on the 31st; minimum temperature, 26°.

TEMPERATURE OF WATER.

The following table shows the maximum, minimum, and mean water temperature, as observed at the harbors of the several stations; the monthly range of water temperature; the average depth at which the observations were made, and the mean temperature of the air:

Temperature of water for August, 1887.

Station	Temperature at bottom.				Mean temperature of the air at station.	Average depth of water, feet and tenths.
	Max.	Min.	Range.	Monthly mean.		
Canby, Fort, Wash.	63.6	57.9	5.7	61.0	56.8	13.7
Cedar Keys, Fla.	90.3	79.5	10.8	83.1	82.5	8.2
Charleston, S. C.	86.0	77.5	8.5	80.2	83.6	36.8
Eastport, Me.	52.8	49.9	2.9	51.2	59.9	16.7
Galveston, Tex.	88.0	84.7	3.3	86.3	83.1	14.2
Key West, Fla.	89.2	83.9	5.3	87.7	83.4	20.3
New London, Conn.	70.2	65.8	4.4	68.7	69.2	12.1
New York City	80.0	71.3	8.7	75.2	71.4	15.9
Pensacola, Fla.	87.7	77.2	10.5	83.9	81.6	18.3
Portland, Me.	65.8	56.5	9.2	59.6	64.8	17.8

• Record for thirty days.

PRECIPITATION (expressed in inches and hundredths).

The distribution of precipitation over the United States and Canada for August, 1887, as determined from the reports of about eight hundred stations, is exhibited on chart iv. In the table of miscellaneous meteorological data are given, for each Signal Service station, the total precipitation, with the departures from the normal. The figures opposite the names of the geographical districts in columns for mean temperature, precipitation, and departures from the normal, show respectively the averages for the several districts. The normal for any district may be found by adding the departure to the current mean when the precipitation is below the normal, and subtracting when above.

Except over an area extending from northern Georgia to central Virginia, and along the coast of Maine, the precipitation in all districts east of the Mississippi River is below the normal; it is also deficient in the states of Arkansas, Missouri, Iowa, Minnesota, in the Pacific coast states, and along the southwestern border from the lower Rio Grande valley to California, with the exception of southeastern Arizona, where reports from a few stations show an excess. The most marked

deficiencies occur in Florida and the upper lake region, where the precipitation is but little more than half of the average.

In the northern plateau, northern and middle slopes, upper Missouri valley, west Gulf states, and, as stated above, over an area extending from northern Georgia to central Virginia, the monthly precipitation is in excess of the August average. In the upper Missouri valley and northern slope the excess amounts to more than one inch. The heaviest rains of the month fell in the northern and western portions of North Carolina and in southern Virginia. The Signal Service observer at Cape Henry, Va., reports a monthly rainfall exceeding sixteen inches, and the voluntary observer at Tarborough, Edgecombe Co., N. C., reports more than twenty-two inches.

DEVIATIONS FROM AVERAGE PRECIPITATION.

The following table shows for certain stations, as reported by voluntary observers, (1) the average precipitation for a series of years; (2) the length of record during which the observations have been taken, and from which the average has been computed; (3) the total precipitation for August, 1887;

(4) the departures of the current month from the average;
(5) and the extreme monthly precipitation for August during the period of observations and the year of occurrence:

State and station.	County.	(1) Average for the month of August.		(2) Length of record.	(3) Total for August, 1887.	(4) Departure from average.	(5) Extreme monthly precipitation for August.			
		Inches.	Years.				Greatest.		Least.	
							Am't.	Year.	Am't.	Year.
Arkansas.		Inches	Years.	Inches	Inches	Inches	Inches	Inches		
Lead Hill.	Boone.	4.80	5	8.23	+ 3.48					
California.										
Sacramento.	Sacramento	0.00	21	trace.	+ trace.					
Fall Brook.	San Diego	0.05	12	0.00	- 0.05	0.26	1880	0.00		(f)
Connecticut.										
Canton *.	Hartford	5.11	26	5.85	+ 0.74					
Hartford *.	Hartford	4.69	16	8.22	+ 3.53					
Middletown *.	Middlesex	4.92	29	4.05	- 0.87					
Wallingford *.	New Haven	5.19	29	4.77	- 0.42					
Illinois.										
Collinsville.	Madison	2.25	4	0.84	- 1.41					
Mattoon.	Coles	3.60	7	3.23	- 0.37	7.70	1885	0.87	1881	
Peoria.	Peoria	3.15	32	2.72	- 0.43					
Riley.	McHenry	3.63	26	4.85	+ 1.22					
Sycamore.	De Kalb	3.76	7	3.61	- 0.15					
Indiana.										
Logansport.	Cass	3.34	33	3.25	- 0.09	9.14	1876	0.17	1861	
Vevay.	Switzerland	3.19	21	2.02	- 1.17					
Iowa.										
Creco.	Howard	2.89	14	2.23	- 0.66					
Monticello.	Jones	4.00	34	3.31	- 0.69	8.54	1885	1.17	1856	
Kansas.										
Independence.	Montgomery	3.14	15	3.60	+ 0.46	7.46	1885	0.39	1874	
Lawrence.	Douglas	3.53	20	4.88	+ 1.35					
Yates Centro.	Woodson	2.22	7	2.19	- 0.03					
Maine.										
Cornish.	York	4.23	30	2.52	- 1.71					
Gardiner *.	Kennebec	3.79	49	3.42	- 0.37					
Orono *.	Penobscot	3.50	19	4.60	+ 1.10					
Maryland.										
Cumberland.	Alleghany	2.83	16	1.12	- 1.71	8.09	1882	0.31	1881	
Fallston.	Harford	5.16	16	5.99	+ 0.83	11.55	1872	1.10	1881	
New Midway.	Fredrick	5.92	6	2.74	- 3.18	15.00	1885	0.87	1886	
Massachusetts.										
Amherst *.	Hampshire	4.35	53	8.72	+ 4.37					
Cambridge *.	Middlesex	4.66	46	3.73	- 0.93					
Chestnut Hill *.	Middlesex	3.52	12	3.53	+ 0.01					
Framingham *.	Middlesex	3.92	13	4.62	+ 0.70					
Lake Cochituate *.	Middlesex	4.95	36	3.70	- 1.25					
Ludlow *.	Hampden	3.87	12	7.30	+ 3.43					
Lynn *.	Essex	3.78	13	5.84	+ 2.06					
Mystic Lake *.	Middlesex	3.74	12	5.17	+ 1.43					
New Bedford *.	Bristol	4.27	74	6.61	+ 2.34					
Springfield *.	Hampden	4.57	40	7.69	+ 3.12					
Waltham *.	Middlesex	4.43	63	4.64	+ 0.21					
Nevada.										
Carson City.	Ormsby	0.10	8	trace.	- 0.10					
New Brunswick.										
Saint John's *.	Saint John's	3.70	27	4.63	+ 0.93					
New Hampshire.										
Antrim.	Hillsborough	3.07	15	8.83	+ 5.76					
Concord.	Merrimac	4.09	32	7.68	+ 3.59					
Hanover *.	Grafton	3.12	20	3.14	+ 0.02					
New Jersey.										
Dover.	Morris	4.54	4	3.20	- 1.34					
South Orange.	Essex	5.06	17	6.38	+ 1.32					
New York.										
Factoryville.	Tioga	2.49	6	2.63	+ 0.14					
Palermo.	Oswego	2.61	34	1.91	- 0.70	6.40	1864	0.50	1870	
Ohio.										
Wauseon.	Fulton	3.03	15	1.52	- 1.51	4.86	1886	1.12	1884	
Pennsylvania.										
Dyberry.	Wayne	3.44	16	5.03	+ 1.59					
South Carolina.										
Kirkwood.	Kershaw	4.04	20	2.23	- 2.71					
Stateburg.	Sumter	3.57	7	4.98	+ 1.41	5.74	1882	2.12	1886	
Texas.										
New Ulm.	Austin	3.04	16	1.72	- 1.32	8.38	1872	0.09	1855	
Vermont.										
Lunenburg *.	Essex	3.70	38	2.36	- 1.34					
Newport *.	Orleans	3.81	13	2.94	- 0.87					
Strafford.	Orange	3.55	13	5.00	+ 1.45					
Virginia.										
Bird's Nest.	Northampton	4.20	19	8.20	+ 4.00	11.25	1875			
Dale Enterprise.	Rockingham	4.00	7	2.87	- 1.13					
Variety Mills.	Nelson	3.25	8	4.91	+ 1.66	7.29	1879	0.57	1881	
Wytheville.	Wythe	3.84	23	5.78	+ 1.94					
West Virginia.										
Belvetia.	Randolph	4.41	10	3.95	- 0.45					

New Jersey.—South Orange, Essex Co.: the total precipitation for the summer of 1887, 21.26, is 8.05 above the average of the last seventeen years.
Texas.—New Ulm, Austin Co.: the total precipitation for the three summer months, 6.72, is 1.85 below the average for the same months during the last sixteen years.
Virginia.—Wytheville, Wythe Co.: the total precipitation for the eight months ending August 31st, 81.27, is 1.54 above the normal for the same months during the period of twenty-three years.

Table of excessive and greatest monthly precipitation for August, 1887.

Station.	Specially heavy.		Largest monthly.	Station.	Specially heavy.		Largest monthly.
	Date.	Amt.			Date.	Amt.	
Alabama.				Maine—Con.			
Opelika	4	2.80	6.33	Portland	24, 25	2.23	6.56
Eufaula	1, 2	2.60		Orono	11, 12	2.00	
Scottsborough	5, 6	3.25		Maryland.			
Mobile	9	2.26		Fort McHenry	22	2.25	
Arizona.				Fallston	21, 22	2.23	
Fort Grant			6.20	Massachusetts.			
Lead Hill			8.28	Wood's Holl.	2	6.92	10.84
Pine Bluff	5, 6	2.10		Vineyard Haven	23, 24	4.70	8.90
Connecticut.				Amherst a	24	3.47	8.72
Hartford a			8.23	Amherst b	18	3.26	7.75
Hartford b	18	3.17	7.93	Do.	24	2.35	
Do.	24	2.63		Springfield			7.69
Dakota.				Ludlow			7.30
Parkeston	2, 3	2.50	10.84	Williamstown	22 to 24	3.91	7.03
Do.	29	3.60		New Bedford			2.60
Fort Sisseton	6	6.00		Do.	25	3.16	6.61
Huron			8.07	Doerfield	2, 3	2.10	6.54
Florida.				Do.	22	2.05	
Limona	25	2.10	11.17	North Truro	24, 25	2.64	6.38
Do.	27, 28	5.60		Milton	24	2.35	
Archer	1, 2	2.37	8.37	Westborough	23, 24	2.00	
Do.	4, 5	2.10		Taunton	22 to 24	3.52	
Ft. St. Augustine	28	4.70	7.25	Edgartown	2, 3	2.44	
Alva	29	2.25	6.66	Michigan.			
Mantua			6.18	Big Rapids	22	2.64	
Georgiana			6.06	Alma	22	2.34	
Live Oak	1, 2	2.10		Minnesota.			
Georgia.				Delano			7.00
Toccoa	1, 2	8.59	15.26	Red Wing			6.10
Do.	3	3.94		Excelsior			6.70
Gainesville	1, 2	5.73	13.16	Fort Snelling	13	2.90	
Do.	18	2.00		Mississippi.			
Way Cross	4, 5	4.05	8.70	Edwards	6, 7	3.67	7.83
Do.	19	2.50		Okolona	6, 7	2.04	
Eastman	1, 2	2.00	8.54	Natchez	6, 7	2.04	
Do.	4, 5	4.03		Do.	18	2.52	
Do.	21	2.00		Montana.			
Athens a	1 to 3	4.80	7.84	Poplar River	14, 13	2.58	
Athens b	1, 2	2.26	6.83	Fort Maginnis	30, 31	2.96	
Augusta	8, 9	3.25	6.75	Nebraska.			
Quitman	1, 2	2.73		Crete	29, 30	2.25	
Griffin	7, 8	2.18		Tecumseh	20, 21	2.85	
Milledgeville	19	2.32		Brownville	20	2.25	
Forsyth	2	2.81		New Hampshire.			
Fort Gaines	7, 8	2.75		Antrim	18	3.27	8.83
Millen	1, 2	2.00		Do.	24, 25	2.16	
Smithville	17, 18	2.37		Concord a	18	2.18	7.78
Atlanta.				Do.	22, 23	2.16	
Illinois.				Concord b			7.38
Cedarville	10	3.00	6.04	Manchester			6.33
Do.	21, 22	2.14		Belmont	25	2.81	6.22
Belvidere	23	2.00	6.01	Lake Village	22 to 24	2.14	
Geneseo	11	3.07		Wolfborough	23 to 25	2.30	
Hennepin	11	2.70		Nashua	23, 23	2.07	
Pana.	11	3.75		New Jersey.			
Richview	16	3.77		New Brunswick a	2	4.62	7.34
Fairview	17	2.00		South Orange	22	4.00	6.38
Lansart	11	2.06		New Brunswick b	2	3.67	6.24
Rockford	11	2.00		Tenafly	22	2.12	
Indiana.				Roseland	23	2.16	
Fortville			6.83	New York.			
Iowa.				Boyd's Corners	22 to 24	2.28	6.85
Logan	20	2.30		Menands	22	2.26	
Fort Madison	12	2.10		Setauket	22	2.26	
Kansas.				North Carolina.			
East Norway	20	5.10	8.42	Asheville	3 to 5	3.05	28.65
Brookville	4, 5	2.03	8.05	Do.	11 to 16	6.30	
Carleiro							

Table of excessive and greatest monthly precipitation for August—Cont'd.

Station.	Specially heavy.		Largest monthly.	Station.	Specially heavy.		Largest monthly.
	Date.	Amt.			Date.	Amt.	
N. Carolina—Con.				S. Carolina—Con.			
Wilmington.....	3, 4	6.61	9.88	Abbeville.....			6.50
Monroe.....	2	2.44	9.42	Jacksonborough..			6.01
Do.....	26, 27	3.55		Stateburg.....	7	2.04	
Raleigh b.....	27	4.05	9.38	Tennessee.			
Lumberton.....	27	2.90	9.11	Rogersville.....	17, 18	2.46	6.43
Charlotte.....	26, 27	3.07	9.02	Milana.....	15 to 17	5.17	6.36
Raleigh c.....			8.85	Milan b.....	15 to 17	5.10	6.28
Hatteras.....	20	2.50		Knoxville.....	6	2.46	
Weldon a.....	1, 2	2.60		Texas.			
Weldon b.....	2	2.61		Cleburne.....			16.30
Lenoir.....	2	2.30		Tyler.....	17, 18	2.03	9.36
Ohio.				Do.....	25, 26	3.73	
West Milton.....	11	2.00		Do.....	30	3.00	
South Carolina.				Houston.....	23	2.44	8.57
Brewer Mines.....	19	4.05	13.70	Do.....	30	3.40	
Greenville.....	1, 2	4.61	12.12	Coriscana.....	29 to 31	6.47	8.17
Do.....	7, 8	2.98		Dallas.....	30	4.50	7.98
Chester.....	1 to 3	3.36	11.93	Waco.....	30, 31	2.65	6.80
Do.....	7, 8	2.08		Galveston.....	30	2.42	6.43
Do.....	19, 20	3.06		Palestine.....	30	2.42	
Do.....	27	2.90		Hearne.....	23	2.46	
Evergreen.....	7, 8	8.32	10.78	Vermont.			
Anderson a.....	8	2.22	10.47	Brattleborough..	18	2.93	7.63
Cheraw.....	7, 8	3.23	10.20	Lunenburg.....	23 to 25	2.60	
Do.....	19, 20	2.14		Virginia.			
Do.....	27	2.25		Cape Henry.....	1 to 7	7.81	16.82
Spartanburg.....	1, 2	2.85	9.11	Do.....	18, 19	3.80	
Do.....	8	3.30		Do.....	23	2.00	
Anderson b.....	7, 8	3.93	8.96	Norfolk.....	2, 3	2.31	8.56
Batesburg.....	6, 7	2.25	8.39	Bird's Nest.....	3	2.50	8.20
Spartanburg a.....	1, 2	2.54	7.84	Fort Monroe.....	6	2.00	7.86
Do.....	8	2.04		Wytheville.....	13, 14	2.06	
Do.....	27	2.38		Wisconsin.			
Winnaborough.....			7.68	Madison.....	10, 11	2.97	
Bennettsville.....	27	2.60	7.20	Beloit.....	22	2.17	
Columbia.....	18 to 20	2.59	7.12	Fond du Lac.....	9, 10	3.74	
Greenwood.....	19, 20	2.15	7.05	Prairie du Chien..	10	2.34	
Newberry.....			6.86	Lancaster.....	10	2.50	
Saint Matthew's..	18	2.05	6.78				

* Record for 20 days.

SLEET.

The observer at Pike's Peak, Colo., reports sleet on the 20th.

SNOW.

Fort Bidwell, Cal.: on the afternoon of the 29th snow fell to a depth of about one and a half inches on the mountains west of this place, at an elevation of 2,000 feet above Fort Bidwell.

Snow is also reported to have fallen at Pike's Peak, Colo., on the 3d to 5th, 10th, 13th to 15th, 17th, 22d to 25th, 28th; the snowfall for these dates aggregating 0.2 inch.

HAIL.

Under the heading "Local storms" will be found descriptions of the more severe hail storms which have occurred during the month. In addition to these, hail was reported to have fallen in the various states and territories as follows:

Alabama.—Mobile, 9th.

Arizona.—Fort Verde, 11th; Fort Apache, 19th.

Arkansas.—Lead Hill, 14th.

Colorado.—Pike's Peak, 1st, 5th, 6th, 9th, 13th to 16th, 18th, 21st to 23d, 26th; Colorado Springs, 3d, 21st; Denver, 24th; Fort Lewis, 28th.

Dakota.—Bismarck and Richardton, 2d; Deadwood, 2d, 4th; Fort Randall, 8th; Yankton, 20th.

Illinois.—Cairo, 15th; Chicago, 18th.

Kansas.—East Norway and West Leavenworth, 20th.

Kentucky.—Louisville, 2d.

Massachusetts.—Fall River and Taunton, 30th.

Michigan.—Swartz Creek, 18th.

Montana.—Fort Maginnis, 30th.

Nebraska.—Sidney, 1st, 21st; Genoa, 4th, 8th; Omaha, De Soto, and Tecumseh, 20th; Fort Robinson, 23d.

Nevada.—Winnemucca, 31st.

New Hampshire.—Mount Washington, 29th.

New Jersey.—Beverly, 20th; Readington, 23d.

New York.—Plattsburg Barracks, 29th.

Oregon.—Linkville, 25th.

South Carolina.—Spartanburg, 17th.

Texas.—San Antonio, 28th.

Utah.—Frisco, 9th; Salt Lake City, 13th.

Wisconsin.—Milwaukee, 4th.

Wyoming.—Fort Laramie, 1st, 22d; Fort Bridger, 14th, 23d; Cheyenne, 21st.

DROUGHT.

California.—San Diego, 31st: the total rainfall at this station during the last four months amounts to but 0.52 inch. On account of the continued dry weather there are but few flowers in bloom and, in consequence, the yield of honey in this county will be very small in comparison with the product of former years.

Illinois.—Mattoon, Coles Co.: the drought was broken by the rain of the 11th.

Greenville, Bond Co.: after drought of many weeks, a good rain fell on the 11th.

Danville, Vermillion Co., 11th: the rain of this date was the first of any consequence that has fallen since July 2d.

Carthage, Hancock Co.: the severe drought continues in this section. Stock is driven from all parts of the county to the artesian well at Carthage for water.

Anna, Union Co., 12th: the protracted drought was broken by a heavy rain on this date.

Pittsfield, Pike Co.: the first heavy rain of the season occurred on the afternoon of the 16th.

Alton, Madison Co.: the drought was broken by a heavy rain on the 16th.

Quincy, Adams Co.: the first rain since July 3d fell on the afternoon of the 16th.

Cerro Gordo, Cerro Gordo Co., 17th: heavy rains have fallen throughout this section; late corn and potatoes will be much improved.

Moweaqua, Shelby Co., 17th: the drought which prevailed in this section during the last two months was broken by a heavy rain on this date.

Tolono, Champaign Co.: water in the Okaw and Embarras rivers began to run on the 17th; both of these streams had been dry southward of this place to beyond the Douglas county line. A heavy rain fell on the 16th, greatly improving vegetation.

Illiopolis, Sangamon Co., 17th: the first heavy rain since May occurred on this date; pastures will be improved, but the rain was too late to be of benefit to corn.

Lincoln, Logan Co.: a heavy rain fell on the 17th; this rain was too late to help corn, but pastures will be greatly benefited.

Cairo, 31st: late corn is suffering for rain; the tobacco crop is in excellent condition.

Indiana.—Terre Haute: the rain which fell on the afternoon of the 4th broke the prevailing drought; 0.66 inch fell in about forty minutes, being the first rain since July 22d; many crops are entirely ruined by the drought. The Wabash River is said to be lower than was ever known before.

The following is from the Saint Louis "Globe-Democrat" of August 13, 1887:

INDIANAPOLIS, IND., August 12.—During the past twenty-four hours central Indiana has been favored with a much needed fall of rain, and, as far as can be learned, the drought has been broken in all parts of the state. More water is needed, but that which has already fallen will prove of great benefit in reviving vegetation. Railway officials are much encouraged, and some of them report that the corn crop along their lines will be very nearly up to the average. This is particularly true of the lines to the west and southwest. The rains have put new life into the grass and potato crops, and unless there is a recurrence of dry weather, the agriculturalists will receive substantial returns from both.

Iowa.—Dubuque, 11th: rain fell throughout northwestern Iowa during the night of the 10-11th; the grain crops and pasturage will be greatly improved.

Creston, Union Co.: the long-continued drought was broken by rain of the 16th.

Cedar Rapids, Linn Co., 31st: this has been another dry month; Cedar River is still below low-water mark; the few light showers that have fallen only moistened the top of the ground.

Kansas.—Wamego, Pottawatomie Co.: a heavy rain fell during the 4th and 5th, the first in thirty days; though too late for corn, it revived vegetation and started streams and springs.

Yates Centre, Woodson Co., 31st: the month was generally hot and dry, there being but one heavy rain, viz., 1.06 inches, on the 16th; water for stock has been, and still is, very scarce.

Kentucky.—Louisville, 15th: the drought which has prevailed in this section for nearly three months was broken by the rain on the night of the 14–15th.

Elkin, Clark Co., 31st: the prevailing drought has done much injury to crops, especially to tobacco.

Louisiana.—Grand Coteau, Saint Landry Parish, 31st: cotton and corn are suffering severely from drought; planters report that cotton will yield about three-fourths of the previously estimated crop.

Michigan.—Thornville, Lapeer Co.: the heavy rain which fell on the 10th broke the long and severe drought.

Lansing, 10th: the rain of this date is the first of consequence since July 21st.

Saugatuck, Allegan Co., 16th: the recent rains have benefited late potatoes and corn.

The August report of the Michigan Weather Service contains the following:

The greatest duration of drought reported by the voluntary observers of the service occurred at Chelsea, Washtenaw Co., and Decatur, Van Buren Co. No rain fell from July 5th to August 9th, inclusive, a period of thirty-seven days. Other stations report the duration of the drought from eighteen to thirty days; this includes the months of July and August. The lack of rainfall was general throughout the central and southern sections from July 23d to August 10th, when rain occurred.

Mississippi.—University, Lafayette Co.: the rain of the 26th broke the severe drought in this locality, and was of much benefit to all growing crops. No rain of any consequence had fallen since the 6th and drought prevailed all over the state, causing much injury to cotton; it is considered that the cotton crop will fall one-third below the estimate of two weeks ago.

Missouri.—Jackson, Cape Girardeau Co.: the drought in this vicinity was broken by a very heavy rain on the 12th. Previous to this rain none had fallen since June 8th.

Boonville, Cooper Co.: the first heavy rain for nearly three months fell on the 12th. Crops and pastures will be greatly benefited.

Lamar, Barton Co.: the drought which has been very injurious to pastures and corn was broken by the rain on the 22d.

Fayette, Howard Co.: the high temperature and small rainfall has, in this immediate locality, severely injured the corn crop, and water is becoming scarce.

Nebraska.—Brownville, Nemaha Co.: the protracted drought was broken on the 10th, when 2.25 inches of rain fell.

Ohio.—The "Chicago Tribune" of August 10th contained the following:

TOLEDO, OHIO, August 9.—All over southern Michigan, northern Indiana, and northwestern Ohio farmers are suffering as never before from the drought. There has been no rain since July 4, and practically none since the last of May, as the June showers were very light. Cattle are driven long distances for water, wells are giving out, and in many of the smaller cities the water-works have failed. The late potato crop is a total failure, and unless rain comes soon corn will not yield half a crop. Buckwheat and turnips have not come up yet, though planted weeks ago. Small fruits and garden vegetables are blighted.

The following is from the Saint Louis "Globe-Democrat" of August 13, 1887:

CINCINNATI, OHIO, August 12.—The drought in this portion of Ohio began in the early part of June, and though it has not been wholly unbroken it has been practically so in nearly all of southern Ohio. The rain of last night here amounted to .36 of an inch, and is the heaviest rainfall since the early part of June. The effect has been felt chiefly in pastures, hay, potatoes, and all vegetables. Corn in all parts of southern Ohio has been more or less injured, though in the plains of Fayette, Madison, and Clark counties the injury is less than in the dry limestone soil of the valleys. If rains should follow this one the upland corn would yet be improved, but in the valleys the damage is past repair. Potatoes are everywhere reported as a virtual failure, and it is hard to see a prospect for a crop, no matter how much rain may come. The chief benefit now from rain will be in reviving pastures and in enabling farmers to prepare for sowing wheat.

Norwalk, Hiram Co.: the rain on the 17th broke the protracted drought which prevailed in this vicinity.

Garrettsville, Portage Co., 17th: the fine rain of this date greatly improved the appearance of the vegetation, but it came too late to help crops.

Pennsylvania.—Erie: the rain of the 4th was much needed; only 0.80 inch has fallen since July 1st.

Tennessee.—Ashwood, Maury Co., 31st: on account of the prevailing drought in this portion of the county, corn will not yield more than half a crop; the cotton crop is in splendid condition, and is at least two weeks more advanced than usual at this season.

West Virginia.—Middlebrook, Randolph Co., 31st: on account of the prevailing drought pastures and meadows are drying up; springs that were never known to fail before are now dry; cattle are beginning to suffer for water, as most of that available is in stagnant pools.

Wisconsin.—Racine, Racine Co., 8th: the drought continues in this county, and crops of all kinds are almost ruined.

La Crosse: the long drought was broken by copious showers on the 13th and subsequent dates; vegetation is growing very rapidly, and it will soon be unnecessary to feed stock on hay, as pastures are now in promising condition.

Marshfield, Wood Co., 16th: the protracted drought has been broken by recent rains.

WINDS.

The most frequent directions of the wind during August, 1887, are shown on chart ii, by arrows flying with the wind. In the Missouri Valley, west Gulf states, and southern slope, the most frequent directions were southerly; in the Ohio Valley, east Gulf states, and on the Atlantic coast, south of New England, they were northerly; in the Saint Lawrence Valley and on the Pacific coast, westerly; in the Lake region and Rocky Mountain districts, variable.

HIGH WINDS (in miles per hour).

During August no wind-velocities exceeding fifty miles per hour were reported in addition to the maximum velocities given in the table of miscellaneous meteorological data, with the exception of those reported from Mount Washington, N. H., viz., 83 nw., 18th, and 90 nw., 19th.

LOCAL STORMS.

Knoxville, Tioga Co., Pa.: between 2 and 3 p. m. on the 1st a violent rain and hail storm passed south of this place, levelling forests and orchards in its path.

New Britain, Hartford Co., Conn.: very severe thunderstorms occurred in this vicinity during the night of the 1st–2d, causing much damage to buildings, etc.; seven dwellings and three barns were struck by lightning, while in the surrounding country many trees and telegraph poles were shattered. Reports show that severe electrical storms occurred during the 1st and 2d at many points in Massachusetts and Connecticut, and a large amount of damage was done by lightning.

Parkston, Hutchinson Co., Dak.: a severe wind, rain, and hail storm occurred on the 2d; hail-stones the size of filberts fell in sufficient quantities to nearly cover the ground; the storm caused serious damage to grain fields.

Louisville, Ky.: a thunder-storm, accompanied by heavy rain, set in at 3.25 and ended at 4.58 p. m. on the 2d; hail fell from 3.38 to 3.49 p. m., some of the hail-stones measuring one-half inch in diameter.

Charleston, W. Va.: a severe wind and rain storm occurred here on the afternoon of the 2d, during which Cotton Opera House was unroofed and several other buildings damaged.