

UNITED STATES OF AMERICA:
WAR DEPARTMENT.

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MONTHLY WEATHER REVIEW.

(GENERAL WEATHER SERVICE OF THE UNITED STATES.)

JANUARY, 1890.

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PREPARED UNDER THE DIRECTION OF
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WASHINGTON CITY:
SIGNAL OFFICE.
1890.

Chart II. Isobars, Isotherms, and Winds. January, 1890.

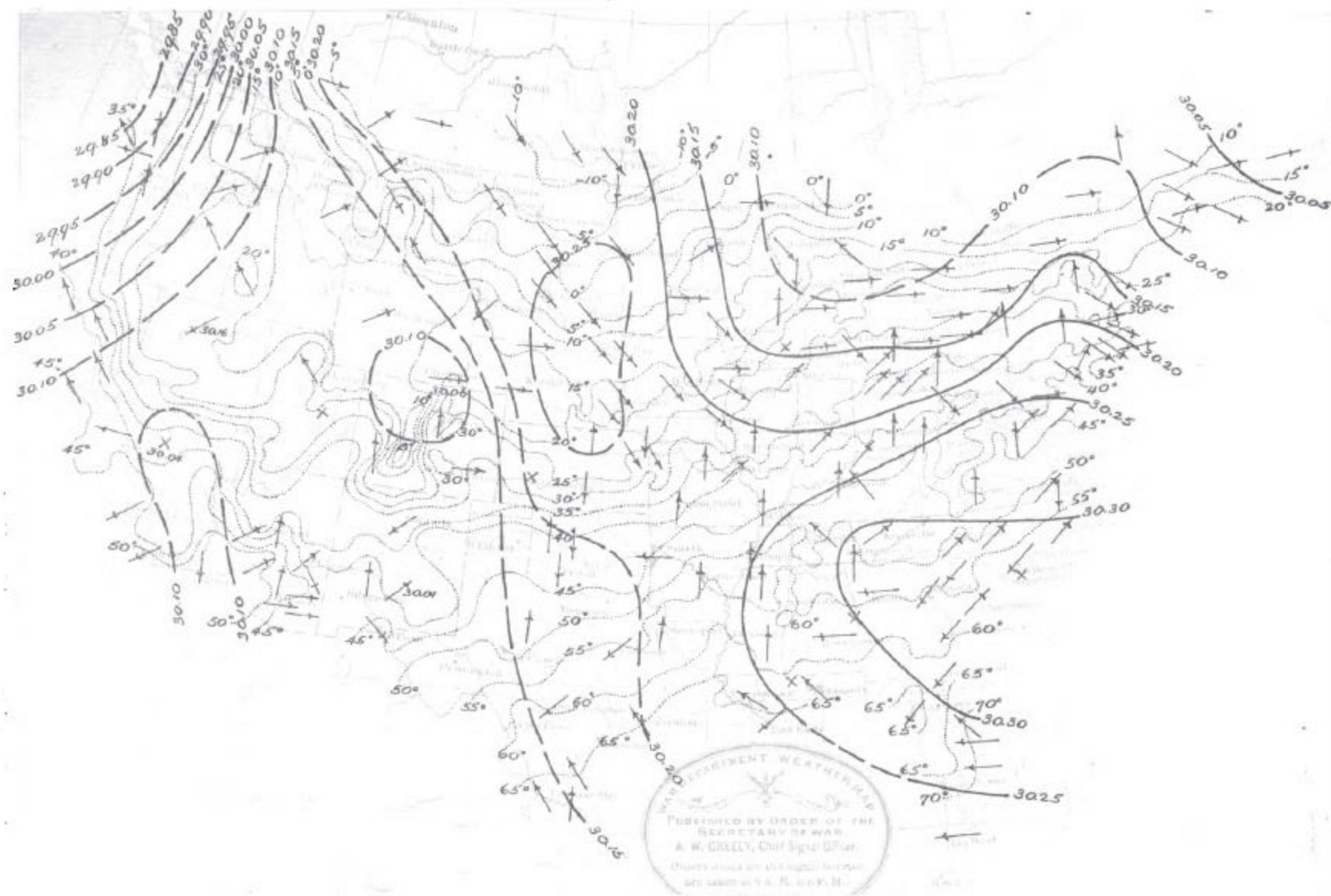
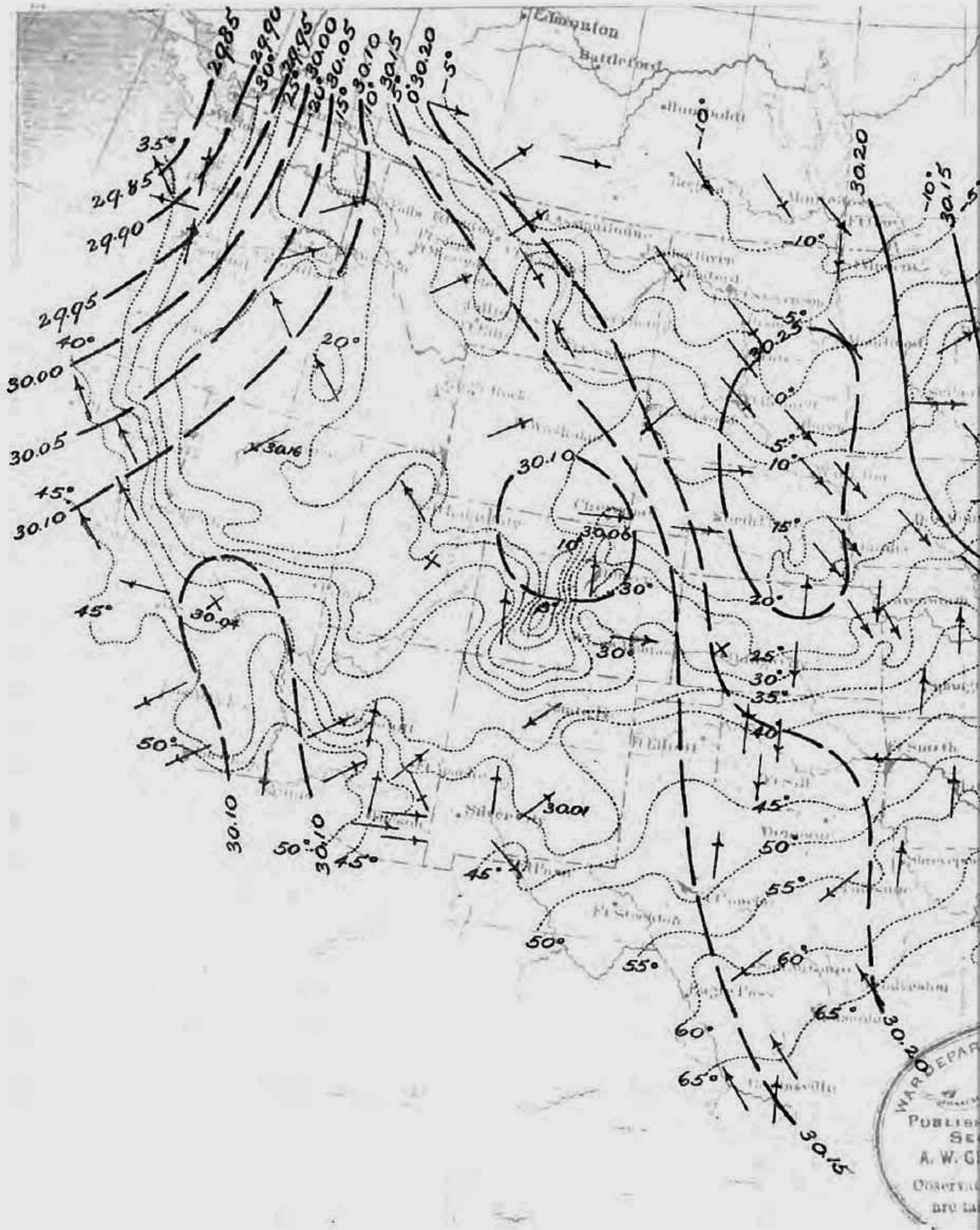


Chart II. Isobars, Isotherms



List of voluntary observers of the Signal Service, etc.—Continued.

P E Blumer Moss Point Miss	Prof W A Buckner Nevada Mo	Chas Seltz De Soto Nebr	Cpl H E Wilkinson Carson City Nev
J B Allen Macon Miss	Max Eimbreck New Haven Mo	E B Taylor David City Nebr	W T Crane (Cranes' Ranch) Elko Nev
W H Snow Natchez Miss	Henry Bruhl Oak Ridge Mo	Dr I Humphrey Fairbury Nebr	W H Shockley Candelaria Nev
S J Russell Okolona Miss	Wm Kaucher Oregon Mo	Post Surgeon Fort Niobrara Nebr	Jackey & Drouillard Cedarville Nev
W H Hill Palo Alto Miss	B C Y Brown Ozark Mo	Post Surgeon Fort Omaha Nebr	D Fowler Downeyville Nev
Dr C W Bolton Pontotoc Miss	Silas C Turnbo Protom Mo	Post Surgeon Fort Robinson Nebr	J F Cupid Ely Nev
Dr J A Mead Pearlington Miss	Wm Hiron Princeton Mo	Post Surgeon Fort Sidney Nebr	C H Sproule Elko Nev
O A Carson Port Gibson Miss	Dr J R Mudd St Charles Mo	Robt Clegg Falls City Nebr	M M Ley Eureka Nev
Dr J W Stevens Rienzi Miss	L C Saeger St Charles Mo	P B Gailord Fairfield Nebr	P W Davis El Dorado Canyon Nev
J N Teunison Summit Miss	Post Surgeon Jefferson Barracks	Isaac E Heaton Fremont Nebr	G W Dungan Genoa Nev
Prof R B Fulton University Miss	Prof F E Nipher Saint Louis Mo	W A Harshbarger Franklin Nebr	H H Robinson Gold Mountain Nev
A J Sanderson Vaiden Miss	Washington University Saint Louis Mo	G W Talbot Grant Nebr	Miss Mary Estabrook (Hot Springs) White Plains Nev
A Erikson Water Valley Miss	C G Taylor Sedalia Mo	J B Moore Grand Island Nebr	Agent C P R R Humboldt Nev
W S Davis Waynesborough Miss	J S Chandler Shelbina Mo	G S Truman Genoa Nebr	Geo Garrison Hawthorne Nev
Prof J Reeves Washington Miss	E A Pinnell Steelville Mo	John P Finley Gering Nebr	J A Feraro Mill City Nev
W S Coleman West Point Miss	G L Osborne Warrensburg Mo	Wm Waterman Hay Springs Nebr	N P Dooley Pioche Nev
H C Goosey Yazoo City Miss	Prof J H Frick Warrenton Mo	G D Carrington Howe Nebr	Agent C P R R Palisade Nev
Missouri.	Capt Wm Hughes Willow Springs Mo	Mrs M G Erickson Kennedy Nebr	Wm Oothout Palmetto Nev
L T Theilmann Appleton City Mo	J R Dudley Wither's Mill Mo	D Henderson Jr Kimball Nebr	W S Devoe (Agl Ex Sta'n) Reno Nev
L Benecke Brunswick Mo	Montana.	University of Nebraska Lincoln Nebr	D Bonnell Riverville Nev
Dr A M McKenzie Centreville Mo	Post Surgeon Fort Assinniboine Mont	J M Tipton Lexington Nebr	W B Lawler Ruby Hill Nev
C F Day Craig Mo	Post Surgeon Fort Custer Mont	John Ellis (Marquette) Central City Nebr	L Allen St Clair Nev
Levi Chubbuck Columbia Mo	Post Surgeon Fort Keogh Mont	J Hull Minden Nebr	T T Keay Sodaville Nev
Sgt A L McRae Columbia Mo	Post Surgeon Fort Maginnis Mont	L S Trefun Mullen Nebr	Prof M D Bowen Tuscarora Nev
Rev Fr Paul Conception Mo	Post Surgeon Fort Missoula Mont	E W Black North Loup Nebr	C R Carter Verdi Nev
Dr J G Reaser Carthage Mo	Post Surgeon Fort Poplar River Mont	J B Parmalee Nebraska City Nebr	Mark Averill Virginia City Nev
A Renisch Excelsior Springs Mo	Post Surgeon Fort Shaw Mont	G S Clingman Oakdale Nebr	W Harton White River Nev
Prof T Berry Smith Fayette Mo	J H Ray Glendive Mont	C Shieldstream Palmer Nebr	H White (Younts Ranch Nev) via Daggett Cal
W W Vermillion Frankford Mo	Wm Gaddis Fort Logan Mont	E Smith Ravenna Nebr	New Hampshire.
Prof C W Pritchett Glasgow Mo	R C Clendenin Martinsdale Mont	A B Hollenbeck Saronville Nebr	F W Palmer Antrim N H
E R Graham Grand Pass Mo	Dr J E Jenkins (Blackfeet Agency) Pigeon Mont	P W Risser Syracuse Nebr	O F Cole Berlin Falls N H
H L Hixson Hannibal Mo	J M Graham Powderville Mont	J S Spooner Sargent Nebr	Q A Bridges Berlin Mills N H
Prof C C Swafford Harris Mo	Sarah E Sheldon Sheldon Mont	W L Dunlap Tecumseh Nebr	W L Foster Concord N H
A J Sharpe Harrisonville Mo	Eugene Stark Virginia City Mont	Dr A B Nesbit Tekamah Nebr	Miss A E Pierce Chesterfield N H
Chas Maushund Hermann Mo	Nebraska.	J L Truman West Hill Nebr	N A Briggs East Canterbury N H
W H Hixson	C Shedd		

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Fleming Junction N J Dr G H Larison 1 Lambertville N J G W Hockenbury Locktown N J J H Eadie Madison N J T J Beans Moorestown N J C V Meyers New Brunswick N J	Prof A Scott New Brunswick N J Sgt E W McGann New Brunswick N J F W Ricord Newark N J C V Meyers Newton N J W Lake Ocean City N J Rev S W Knipe Oceanic N J T Reed Princeton N J J Fleming Readington N J S Haines Rancocas N J Dr W J Chandler South Orange N J A D Atwood Tenafly N J E R Cook Trenton N J F S Dunbar Union N J W T Wilson Woodbury N J New Mexico. 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S J Russell Okolona Miss	S S Stahl Kidder Mo	Post Surgeon (Camp Poplar River)	Mrs M G Erickson Kennedy Nebr	N P Dooley Pioche Nev
W H Hill Palo Alto Miss	Charles Patterson Kirksville Mo	Poplar Creek Agency Mont	D Henderson Jr Kimball Nebr	Agent C P R R Palisade Nev
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A Reinisch Excelsior Springs Mo	Capt Wm Hughes Willow Springs Mo	W L Rutledge Grant Nebr	W T Crane (Cranes' Ranch) Elko Nev	R Ross Asbury N J
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C L Hixson Hannibal Mo	Post Surgeon Fort Assiniboine Mont	O F Hartwell Hastings Nebr	G W Dungan Genoa Nev	Dr J F Leaming Cape May C H N J
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New Frankford Mo
Max Eimbeck
New Haven Mo
Henry Bruhl
Oak Ridge Mo
Wm Kaucher
Oregon Mo
M B W Harman
Pickering Mo
W A McDowell
Platt River Mo
Silas C Turnbo
Protem Mo
Wm Hiron
Princeton Mo
C B Armstrong
Sarcxie Mo
Dr J R Mudd
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L C Saeger
St Charles Mo
Post Surgeon
Jefferson Barracks
Saint Louis Mo
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C G Taylor
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J S Chandler
Shelbina Mo
E A Pinnell
Steelville Mo
Prof Geo L Osborne
Warrensburg Mo
Prof J H Frick
Warrenton Mo
Capt Wm Hughes
Willow Springs Mo
G W Goodlett
Windsor Mo
J R Dudley
Wither's Mill Mo
Montana.
R W Rock
(Henry's Lake Idaho)
Allerdice Mont
S M Corson
Choteau Mont
Post Surgeon
Fort Assiniboine Mont

Post Surgeon
Fort Custer Mont
Post Surgeon
Fort Keogh Mont
Post Surgeon
Fort Missoula Mont
Post Surgeon
(Camp Poplar River)
Poplar Creek Agency Mont
Wm Gaddis
Fort Logan Mont
Post Surgeon
Fort Shaw Mont
J H Ray
Glendive Mont
C A Wood
Horr Mont
R C Clendenin
Martinsdale Mont
Dr J E Jenkins
(Blackfeet Agency)
Piegan Mont
J M Graham
Powderville Mont
Eugene Stark
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Crete Nebr
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Holdrege Nebr
G D Carrington
Howe Nebr

J M Bird
Imperial Nebr
Mrs M G Erickson
Kennedy Nebr
D Henderson Jr
Kimball Nebr
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John Ellis (Marquette)
Central City Nebr
J Hull
Minden Nebr
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Oakdale Nebr
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Ough Nebr
C Shieldstream
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P W Kissel
Syracuse Nebr
J S Spooner
Sargent Nebr
W J Hoyford
Seward Nebr
W I Dunlap
Tecumseh Nebr
Dr A D Nesbit
Tekamah Nebr
J L Truman
West Hill Nebr
G Treat
Weeping Water Nebr
E G Bruner
West Point Nebr
J R Campbell
Weston Nebr
Mrs C W Le Bar
Wilcox Nebr
Nevada.
O B Vincent
Austin Nev
Agent C P R R
Beowawe Nev
G Nicholl
Belmont Nev
W H Shockley
Candelaria Nev
Prof C W Friend
Carson City Nev
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Carson City Nev
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(Cranes' Ranch)
Elko Nev
D Fowler
Downeyville Nev
J F Cupid
Ely Nev
C H Sproule
Elko Nev
P W Davis
El Dorado Canyon Nev
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Eureka Nev
G W Dungan
Genoa Nev
Agent C P R R
Halleck Nev
C F Mengel
Hawthorne Nev.
L Merrill
(Hot Springs)
White Plains Nev
Agent C P R R
Humboldt Nev

Miss Kate Lewers
(Lewers Rancho)
Leonard Creek Nev
S F Reeves
Mil City Nev
N P Dooley
Pioche Nev
Agent C P R R
Palisade Nev
Wm Oothout
Palmetto Nev
I G McMonigal
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Cotton and Woollen M'fg Co
Lake Village N H
Charles Norse
Littleton N H
W Little
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North Conway N H
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Plymouth N H
N B Waters
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West Milan N H
New Jersey.
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Asbury N J
H Allaire
Allaire N J
Prof C F Richardson
Beverly N J
J H Preston (Billingsport)
Paulsborough N J
H A Jordan
Bridgeton N J
Rev W J Leggett
Belleville N J
Dr J F Leaming
Cape May C H N J
H Y Postma
Egg Harbor City N J
Miss A S Yard
Freehold N J
R N Cornish
Gillette N J
J M Dalrymple
Hopewell N J

Dr F C Price
Imlaystown N J
Geo. Fleming
Junction N J
Dr G H Larison
Lambertville N J
G W Hockenbury
Locktown N J
J H Eadie
Madison N J
T J Beans
Moorestown N J
W Earle Cass
Newark N J
F W Ricord
Newark N J
Mrs G H Cook
New Brunswick N J
C V Myers
New Brunswick N J
Prof A Scott
New Brunswick N J
Sgt E W McGann
New Brunswick N J
T W Iliff
Newton N J
W Lake
Ocean City N J
Rev S W Knipe
Oceanic N J
J Fleming
Readington N J
S Haines
Rancocas N J
Dr W J Chandler
South Orange N J
A D Atwood
Tenafly N J
E R Cook
Trenton N J
W T Wilson
Woodbury N J
New Mexico.
A Knell
Albert N Mex
H S Beattie
Albuquerque N Mex
W P Metcalf
Antelope Springs N Mex
S Paris
Bernalillo N Mex
E A Sutherland
Chama N Mex
J M Fish
Coolidge N Mex
B Ventura Martinez
Cuba N Mex
M G Burkholder
Embudo N Mex
E A Clemens
Estalida Sps (via)
Magdalena N Mex
Post Surgeon
Fort Bayard N Mex
Post Surgeon Fort Marcy
Santa Fe N Mex
Post Surgeon
Fort Stanton N Mex
Post Surgeon
Fort Union N Mex
Post Surgeon
Fort Wingate N Mex
J E Whitmore
Gallinas Spring N Mex
J E Smith
Hillsborough N Mex
Richard Pohl
Los Lunas N Mex
E K Caldwell
Monero N Mex
Jose M Vega
Nogal N Mex
Jno Boquet
Pojuaque N Mex
R H Hills (Red Canon)
Carthage N Mex

for January at stations in Connecticut, New Jersey, Pennsylvania, Maryland, Virginia, North Carolina, Florida, Louisiana, Arkansas, and Tennessee, and that at Sacramento, Cal., the mean temperature was the lowest ever reported for January.

MAXIMUM AND MINIMUM TEMPERATURES.

The highest temperature reported by a regular station of the Signal Service was 88°, at Rio Grande City, Tex., on the 10th. The temperature rose to or above 80° at stations along the Atlantic coast south of the thirty-fifth parallel, in the lower Mississippi valley, from Indian Territory southward over central and south-central Texas, and in southwestern Arizona, and the maximum values were above 70° south of a line traced from the Atlantic coast in about latitude north 40° westward to Colorado, thence southward to south-central New Mexico, and thence westward to southeastern California. The lowest maximum temperature reported was 32°, at Saint Vincent, Minn., and the maximum values fell below 50° north of a line traced from the northern part of lower Michigan southwestward to central Iowa, thence northwestward to central North Dakota, thence southwestward to central Utah, thence westward to west-central Nevada, and east of this line continued northward over eastern Oregon and southeastern Washington, and thence westward to southwestern Washington. The reports of United States Army post surgeons and state weather service and voluntary observers show the following maximum temperatures in states and territories where the temperature was reported 80° or above: Citronelle, Ala., 84°; Fort Lowell, Ariz., 86°; Lead Hill, Ark., 81°; Breckenridge, Colo., 84°; Lake City, Fla., 89°; Camilla, Ga., 83°; Convent, La., 88°; Brookhaven, Kosciusko, and Port Gibson, Miss., 82°; Clarkton N. C., 85°; Conway, S. C., 81°; Fort Ringgold, Tex., 97°. At a number of the older established Signal Service stations in New England, the middle and south Atlantic states, the Florida Peninsula, the east and west Gulf states, the Ohio Valley and Tennessee, the lower and upper lake regions, the upper Mississippi and lower Missouri valleys, and the southern plateau region the maximum temperatures for the current month were the highest ever reported for January. The greatest excesses in the districts named were, respectively. Portland, Me., 4° above maximum of 1876; Philadelphia, Pa., 5° above maximum of 1876; Washington City, 5° above maximum of two or

more; and thence northward over central Oregon and Washington, 65°; and the highest minimum temperature reported was 65° at Key West, Fla., and the minimum values were above 40° over the Florida Peninsula and extreme southern Louisiana. The reports of United States Army post surgeons and state weather service and voluntary observers show the following minimum temperatures in states and territories where the temperature fell to or below zero: Martindale, Mont., -42°; Gallatin, N. Dak., -40°; Gunnison, Colo., -39°; Pokegama Falls, Minn., -38°; Niellville, Wis., -36°; Fort Niobrara, Nebr., -34°; Soda Springs, Idaho, and Millbank, S. Dak., -31°; Fort Bridger, Wyo., -30°; Fayette, Iowa, -27°; Jordan Valley, Oregon, -24°; Orono, Me., and Fort DuChesne and Nephi, Utah, -23°; Fort Spokane, Wash., -22°; Fremont, Kans., and West Milan, N. H., -21°; Fort Bidwell, Cal., and Crystal Falls, Mich., -20°; Conception, Mo., -19°; East Berkshire, Vt., -18°; Plattsburgh Barracks, N. Y., -15°; Woodstock, Ill., -13°; Fort Marcy, N. Mex., -4°; La Fayette, Ind., and Lake Cochituate, Mass., -3°; and Blue Knob, Pa., -2°. Among extremely low temperatures reported for January of preceding years are: Poplar River, Mont., -63°, in 1885 (this is the lowest temperature ever reported for any month in the United States); Saint Vincent, Minn., -53°, in 1888; La Crosse, Wis., -43°, in 1873; Duluth, Minn., -41°, in 1885; Fort Sully, S. Dak., -39°, in 1883; Fort Klamath, Oregon, -39°, in 1888; Cheyenne, Wyo., -38°, in 1875; Eagle Rock, Idaho, -38°, in 1883; Dubuque, Iowa, -31°, in 1887; Winnemucca, Nev., -28°, in 1888; Indianapolis, Ind., -25°, in 1884; Burlington, Vt., -25°, in 1882; Oswego, N. Y., -23°, in 1885; Eastport, Me., -20°, in 1874; Albany, N. Y., -18°, in 1878; Whipple Barracks (Prescott), Ariz., -17°, in 1880; Washington City, -14°, in 1881; Fort Elliott, Tex., -14°, in 1888; Charlotte, N. C., -1°, Atlanta, Ga., -2°, and Little Rock, Ark., -5°, in 1886; Jacksonville, Fla., 15°, in 1886; Brownsville, Tex., 18°, in 1881; Red Bluff, Cal., 18°, in 1888; and Los Angeles, Cal., 30°, in two or more years. The lowest absolute minimum temperature for January of preceding years was generally noted in the south Atlantic, east and west Gulf states, and the Florida Peninsula, in 1886; in the Ohio and upper Mississippi valleys and Tennessee, in 1884; in the middle and northern plateau regions and on the Pacific coast, in 1888; elsewhere the periods of occurrence were irregular.

Deviations from normal temperatures—Continued.

State and station.	County.	(1) Normal for the month of Jan.	(2) Length of record.	(3) Mean for Jan., 1890.	(4) Departure from normal.	(5) Extreme monthly mean temperature for Jan.			
						Highest.	Year.	Lowest.	Year.*

Oregon.		o	Years	o	o	o		o	
Albany	Linn.....	37.5	12	34.3	+3.2	43.8	1887	22.8	1868
Eola	Polk.....	37.3	19	31.0	-6.3	42.7	1874	29.7	1875
Pennsylvania.									
Dyberry	Wayne	20.7	25	31.6	+10.9	31.6	1890	13.9	1865
Grampian Hills..	Clearfield....	22.6	25	34.7	+12.1	35.0	1880	16.1	1867
Wellsborough ...	Tioga.....	24.7	10	35.8	+11.1	35.8	1890	19.1	1884
South Carolina.									
Statesburgh.....	Sumter.....	44.4	8	54.6	+10.2	54.6	1890	39.0	1886
Tennessee.									
Austin	Wilson	36.6	21	50.2	+13.6	53.1	1880	28.2	1884
Milan	Gibson	33.3	6	47.9	+14.6	47.9	1890	27.5	1886
Texas.									
New Ulm	Austin	50.1	16	60.0	+9.9	63.7	1880	34.8	1875
Vermont.									
Stratford	Orange	15.6	16	22.3	+6.7	25.4	1889	6.9	1888
Virginia.									
Birdsneest.....	Northampt'n	39.3	21	49.6	+10.3	49.6	1890	33.7	1881
Wisconsin.									
Madison	Dane	16.6	27	22.6	+6.0	33.6	1880	4.1	1875
Washington.									
Fort Townsend ..	Jefferson	39.1	18	31.9	-7.2	55.4	1888	29.6	1869

* 1861, 1880, 1890. † Received too late to be used in discussion.

imum of 1888; Sandusky and Toledo, Ohio, 5° above maximum of 1880 and 1876, respectively; Grand Haven, Mich., 4° above maximum of 1880; Springfield, Ill., 4° above maximum of 1880; Leavenworth, Kans., 2° above maximum of 1876; Fort Apache Ariz., 4° above maximum of two or more preceding years. In the south Atlantic states the highest previous maximum temperature for January was generally noted in 1879; in the lower Rio Grande valley in 1887; in the lower lake region in 1874; in the upper Mississippi valley in 1874 or 1880; elsewhere the periods of occurrence were irregular.

The lowest temperature reported by a regular station of the Signal Service was -39° at Fort Assiniboine, Mont., on the 5th. The temperature fell below -30° in the Valley of the Red River of the North and thence westward over North Dakota and the eastern half of Montana. The minimum values were below -20° in Minnesota (except along the shore of Lake Superior) and north of a line traced from eastern Wisconsin south of Green Bay westward to southeastern Idaho, and thence northwestward over the eastern part of Washington; they were also below -20° over northwestern Nevada. The minimum temperature fell below zero north of a line traced from the coast of northern Massachusetts, north of west to northern lower Michigan, thence southward over Lake Michigan to central Illinois, thence south of west to northern New

Gulf states in 1880; on the southeastern slope of the Rocky Mountains, in the southern plateau region, and on the south Pacific coast in 1887; and on the north and middle Pacific coasts in 1889. Elsewhere the periods of occurrence were irregular.

For January, 1890, the average percentages of the precipitation in districts where the precipitation was in excess of the average for the month were about as follows: west Gulf states, 141 per cent.; Ohio Valley and Tennessee, 150 per cent.; lower lake region, 148 per cent.; upper lake region, 143 per cent.; extreme northwest, 109 per cent.; upper Mississippi valley, 187 per cent.; Missouri Valley, 122 per cent.; middle-eastern slope of the Rocky Mountains, 243 per cent.; southeastern slope of the Rocky Mountains, 136 per cent.; southern plateau region, 170 per cent.; middle plateau region, 228 per cent.; north Pacific coast, 120 per cent.; middle Pacific coast, 165 per cent.; south Pacific coast, 226 per cent. In districts where the precipitation was below the average for the month the percentages of the normal were about as follows: New England, 66 per cent.; middle Atlantic states, 46 per cent.; south Atlantic states, 22 per cent.; Florida Peninsula, 18 per cent.; east Gulf states, 38 per cent.; Rio Grande Valley, 75 per cent.; northeastern slope of the Rocky Mountains, 43 per cent.; northern plateau region, 85 per cent. The statement of percentages of precipitation by districts shows that the greatest excess above the normal amount for January occurred on the middle-eastern slope of the Rocky Mountains, where the unusually heavy rainfalls at stations in Indian Territory made the precipitation for the current month nearly two and one-half times greater than the January average for that district, and on the south Pacific coast, where the rainfall was more than double the usual amount for January. The greatest deficiencies are shown in the Florida Peninsula, where but 18 per cent. of the normal fell, and the precipitation was less than one-half the usual amount for January in the middle and south Atlantic states, the east Gulf states, and on the northeastern slope of the Rocky Mountains.

DEVIATIONS FROM AVERAGE PRECIPITATION.

Gardin
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Kalam
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Fort S
New
Hanov
New
Moore
South
Ne
Cooper
Palern
North
Lenoi
N. Lev
Wause
C
Albany
Eola
Penn
Dyber
Gramp
Wells
South
States
Te
Austin
Milan
New U
V
Straffo
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Birdan
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Stations and districts.	Elevation above sea-level, feet.	Pressure, in inches.			Temperature of air, in degrees Fahrenheit.								Mean temperature of the dew-point.	Mean relative humidity, per cent.	Precipitation, in inches.	Departure from normal precipitation.	Wind.				Cloudless days.	Partly cloudy days.	Cloudy days.	Days with rainfall.	Average cloudiness, tenths.		Length of record, years.	Precipitation data since opening of station.				
		Mean actual.	Mean reduced.	Monthly range.	Monthly mean.	Departure from normal.	Maximum.	Mean maximum.	Minimum.	Mean minimum.	Greatest daily range.	Least daily range.					Total movement, miles.	Prevailing direction.	Maximum velocity.						8 a. m.	8 p. m.		(greatest for month.	Year.	Least for month.	Year.	
																			Miles per hour.	Direction.												Date
<i>Ex. northwest-Con.</i>																																
Fort Buford	1,900	27.94	30.04	1.26	22.4	-0.6	51	32.1	-18	12.7	48	5	16.0	79.8	0.58	+0.18	7,574	e.	60	nw.	24	3	18	10	8	6.5	6.1	12	1.17	1881	0.03	*
Fort Yates .....	.....	.....	.....	.....	25.6	+0.8	58	36.3	-16	15.4	44	9	.....	.....	0.30	-0.25	.....	se.	.....	.....	.....	1	25	5	7	.....	.....	8	1.42	1888	0.23	1884
<i>Upper Miss. Valley.</i>																																
Saint Paul	831	29.17	30.11	1.08	22.4	-4.6	51	30.5	-16	14.3	32	4	13.8	74.4	1.11	-0.32	5,789	w.	34	w.	25	10	12	9	13	5.1	4.9	20	3.25	1882	0.06	1883
La Crosse	744	29.30	30.13	1.08	25.0	-4.0	50	34.3	-18	15.8	36	6	15.6	73.9	0.63	-1.11	5,084	nw.	29	w.	25	9	15	7	10	4.5	4.9	18	4.23	1876	0.13	1883
Davenport	615	29.43	30.12	1.19	30.0	-4.0	61	38.3	-8	21.6	29	3	19.8	71.0	2.34	+0.14	5,211	nw.	36	e.	27	6	18	7	13	4.6	4.6	19	4.35	1876	0.17	1885
Des Moines	869	29.15	30.11	1.09	29.7	-4.3	66	38.9	-8	20.5	33	9	19.8	71.6	0.91	-0.65	6,533	nw.	36	ne.	27	19	5	7	12	4.8	4.2	12	3.09	1888	0.04	1885
Dubuque	651	29.39	30.13	1.06	27.9	-4.1	59	36.6	-12	19.2	30	3	21.2	80.5	1.68	-0.78	4,785	nw.	40	w.	25	9	12	10	13	4.1	5.0	17	4.53	1877	0.30	1889
Keokuk	613	29.45	30.14	1.35	32.6	-4.4	67	41.6	-6	23.6	31	5	23.8	75.3	2.43	+0.22	5,496	nw.	34	w.	25	11	12	8	12	4.7	4.7	19	3.78	1878	0.17	1885
Cairo	359	29.72	30.11	1.23	42.9	-4.1	74	49.5	11	36.3	31	3	30.0	66.2	6.14	+2.29	8,191	n.	58	w.	27	10	6	15	12	5.8	5.6	19	9.84	1876	1.08	1885
Springfield, Ill....	644	29.40	30.11	1.35	34.2	-5.8	64	42.6	2	25.9	26	4	23.8	70.8	2.20	-0.50	7,306	nw.	36	e.	27	8	11	12	13	5.2	7.1	11	4.92	1882	0.17	1885
Saint Louis	571	29.50	30.13	1.40	39.0	-4.0	69	47.4	6	30.7	32	6	26.3	65.6	5.99	+3.03	9,236	nw.	60	w.	27	10	9	12	12	4.2	5.4	20	6.90	1876	0.40	1885
<i>Missouri Valley.</i>																																
Columbia .....	.....	.....	.....	1.23	37.0	.....	70	49.1	-6	24.8	46	14	.....	.....	2.80	.....	6,801	nw.	48	sw.	27	7	10	14	10	.....	5.4	1	.....	.....	.....	.....
Kansas City	947	29.08	30.13	1.33	38.3	.....	73	47.9	5	28.7	32	6	24.8	65.4	1.15	.....	6,541	n.	33	sw.	24	7	16	8	8	5.0	5.8	2	1.61	1889	1.15	1890
Springfield, Mo....	1,356	28.61	30.08	1.14	42.6	.....	75	53.6	6	31.7	37	3	29.																			

given under "Local storms." Hail was reported as follows: 1st, Ga., Idaho, Nebr., Nev., Ohio, Oregon, S. C., S. Dak., Va. 2d, Iowa, Mich., Mo., Nebr., Tenn. 3d, Colo., Idaho, Ill., Iowa, Ky., Mich., Minn., Nebr., Nev., N. Y., Ohio, Pa., S. Dak., Tex., W. Va., Wyo. 4th, Iowa, Kans., Mich., Minn., Nebr., N. Y., N. C., Pa., S. Dak., Wis., Wyo. 5th, Ind. T., Iowa, Mich., Mo., N. Y., Ohio, Penn. 6th, Colo., Mich., N. J., N. Y. 7th, La., Tex. 9th, Idaho. 10th, Kans., Pa., Va., Wyo. 11th, Ala., Conn., Ga., Ill., Ind., Iowa, Mo., Mont., N. J., N. Y., Ohio, Pa., S. C., S. Dak., Tex. 12th, Ill., Md., Miss., Pa. 13th, Ill., Ind., Iowa, Kans., Ky., Minn., N. C., S. Dak., Tenn., W. Va., Wis. 14th, Idaho, Ill., Ind., Iowa, Kans., Mo., Nebr. 15th, Colo., Ga., Ind., Iowa, Kans., Nebr., N. Dak., Tenn., Va. 16th, Ark., Colo., Kans., La., Mo., N. J., N. Y., Tenn., Wash. 17th, Colo., Ill., Mich., N. Mex., N. Y., Oregon, Pa., S. C., S. Dak., Wash. 18th, Colo., Idaho, Ind., Iowa, La., Minn., Mo., N. Dak., S. Dak., Wis. 19th, Idaho, Kans., Minn., Mont. 20th, Ind., Minn., Nebr., S. Dak. 21st, Ala., Iowa, Minn., S. Dak., Tenn.,

Va. 22d, Ill., Iowa, Nebr., N. C., Ohio, Pa. 23d, Minn., Nebr., N. C., Pa., Vt., Va. 24th, Cal., Mont. 25th, Idaho, N. Dak., S. Dak. 26th, Mass. 27th, Idaho, Mich., Nebr., N. Dak., Tenn., Tex. 28th, Cal., Colo., Iowa, Mich., Nebr., N. Y., Ohio, S. Dak., Tenn. 29th, Minn., Miss., N. C., N. Dak., Ohio, S. Dak., Tenn. 30th, Minn., Miss.

SLEET.

Sleet was reported as follows: 4th, Colo. 5th, Pa. 6th, Colo., N. Y. 7th, Colo. 12th, N. Y.

SNOW (snowfall in inches and tenths).

The heaviest monthly snowfall was reported at elevated stations in central Colorado, where a maximum depth of 4.8 fell at La Veta; 3, at Stamford; 2.50, at Breckenridge; and trace, at Box Elder, Colo. In Nevada 3 fell at Ruby Hill, in the east-central part, and 1, at Tuscarora, in the north-central part of the state, and a trace was reported at West Milan, N. H., Cheyenne and Fort Bridger, Wyo.

WINDS.

The prevailing winds during June, 1890, are shown on chart ii by arrows flying with the wind. In New England, the lower lake region, on the northeastern slope of the Rocky Mountains, over the northern plateau region, and along the middle Pacific coast the winds were mostly from northwest to southwest; in the middle Atlantic states, on the middle-eastern slope of the Rocky Mountains, over the southern plateau region, and along the north Pacific coast, from south to west; in the south Atlantic states, from the southwest; over the Florida Peninsula, and in the extreme northwest, from east to southeast; in the west Gulf states, and in the Missouri Valley, from south to southeast; in the Rio Grande Valley, from the southeast; in the Ohio Valley and Tennessee, and along the south Pacific coast, from west to southwest; in the upper Mississippi valley, from southeast to southwest; on the southeastern slope of the Rocky Mountains, from south to southwest; over the middle plateau region from west to northwest; and in the east Gulf states, and the upper lake region, variable.

HIGH WINDS (in miles per hour).

Wind velocities of 50 miles, or more, per hour were reported at regular stations of the Signal Service as follows: 1st, 50, n., at Fort Sully, S. Dak.; 59, sw., at Rapid City, S. Dak. 2d, 50, n., at Valentine, Nebr.; 60, n., at Huron, S. Dak. 4th, 50, nw., at Valentine, Nebr.; 66, w., at Fort Sully, S. Dak. 5th, 50, sw., at Memphis, Tenn.; 53, sw., at Chicago, Ill.; 54, sw., at Davenport, Iowa. 6th, 54, ne., at Galveston, Tex. 9th, 76, nw., at Fort Assiniboine, Mont. 10th, 54, sw., at Fort Elliott, Tex. 11th, 50, sw., at Fort Assiniboine, Mont. 13th, 52, se., at Bismarck, N. Dak.; 54, w., at Fort Assiniboine, Mont. 17th, 60, nw., at Detroit, Mich. 21st, 50, w., at Fort Assiniboine, Mont. 22d, 60, se., at Yankton, S. Dak. 23d, 70, se., at Yankton, S. Dak. 26th, 52, s., at Cheyenne, Wyo. 27th, 56, nw., at Fort Buford, N. Dak.; 52, nw., at Valentine, Nebr. 29th, 50, ne., at Chicago, Ill.; 60, n., at Lexington, Ky. 30th, 52, nw., at Columbus, Ohio.

LOCAL STORMS.

accompanied by high wind and heavy rain, passed over the northern part of Detroit Mich., its path being marked by demolished buildings, prostrated trees, etc. Severe storms were also reported throughout lower Michigan on this date. At Bradshaw, Nebr., a funnel-shaped cloud was observed in the southwest at 7.20 p. m., the funnel of which appeared to reach from the cloud to the earth; it suddenly scattered, and as quickly formed again; anew it scattered and formed, and swinging to and fro, had the form of an elephant's trunk. At this time what appeared a black cloud formed near the ground and assumed the form of an inverted funnel, making the clouds appear like an immense hour-glass; next the depression in the middle filled until the cloud became a solid column from one-third to one-half mile in diameter, in which form it passed over the city. Twelve persons were reported killed, and many were injured; the damage done to property is carefully estimated at \$108,800, not including loss of live stock. At Glenwood, Iowa, a terrific wind and rain storm advanced from the west at 2 a. m., damaging buildings and blowing down trees. At Dubuque, Iowa, severe thunderstorms, attended by unusually heavy rain, prevailed during the 2d, 3d, and 4th, and two lives were reported lost in wash-outs on the railroads. The Iowa Weather and Crop Service report states "that on the afternoon of the 4th a number of small but vigorous tornadoes occurred in Adair, Guthrie, Dallas, Boone, Webster, Hamilton, Hardin, Humboldt, and Howard counties, Iowa. The tracks were not continuous, and the tornado clouds arose and descended at intervals, making long jumps between the points of contact with the earth. The first tornado was reported near Adair, Adair Co., about 1.30 p. m., moving in a northeasterly direction; several barns were destroyed; trees were prostrated; wire fences were rolled up in balls, and poultry was stripped of feathers. This storm descended in the vicinity of Dawson, Dallas Co., and Angus, Boone Co., demolishing a large railroad bridge, destroying much property, and injuring many persons. The track of the

Meteorological record of voluntary observers, &c.—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean			Max.	Min.	Mean	
<i>Maine—Cont'd.</i>					<i>Michigan—Cont'd.</i>				
Cornish.....	84	45	63.8	6.58	Atlantic.....	76	40	59.1	3.20
Fairfield.....	83	40	61.1	2.97	Ball Mountain.....	89	39	68.8	3.52
Farmington.....	47	59	3.12		Bangor.....	100	40	75.3	5.27
Fort Preble.....	41	45	45.5		Bear Lake.....	91	34	67.8	2.18
Kennebec Arsenal.....	78	45	59.8	1.64	Bent Branch.....	92	40	71.0	3.29
Kent's Hill.....	83	42	59.2	4.64	Benton Harbor.....	97	43	74.5	5.24
Lewiston.....	88	42	60.8	3.71	Berlin.....	94	40	71.7	5.56
Mayfield.....	81	36	58.2	3.97	Berrien Springs.....	97	46	72.6	3.85
Orono.....	82	44	59.5	3.84	Birmingham.....	92	40	71.6	3.16
Petit Menan.....	73	44	57.4		Bronson.....	90	40	72.3	2.22
West Jonesport.....	70	46	54.4		Buchanan.....	90	45	70.6	5.24
<i>Maryland.</i>					<i>Calumet.....</i>				
Barren Creek Sp'g.....	90	52	73.6	1.59	Cassopolis.....	93	40	72.5	3.43
Cumberland (1).....	92	48	72.6	3.07	Caldwell.....	94	35	69.5	1.99
Cumberland (2).....	93	49	74.2	3.16	Charlevoix.....	89	39	65.4	2.69
Fallston.....	90	52	71.7	2.37	Chase.....	96	35	69.0	4.55
Fort McHenry.....	92	50	73.3	1.40	Cheboygan.....	88	34	63.5	2.13
Frederick.....	92	51	74.0	1.88	Chelsea.....	88	35	70.0	4.32
Gaithersburg.....	92	56	70.9		Clinton.....	98	35	72.3	1.54
Galena.....	92	52	73.2	1.60	Colon.....	92	42	69.3	3.11
Jewell.....	92	52	70.4	1.84	Concord.....	95	41	70.5	2.64
McDonogh.....	90	52	73.0	2.38	Crystal Falls.....	88	40	69.2	3.24
Mt. St. Mary's Coll.....	92	45	73.0	2.84	Detroit.....	93	41	73.8	4.00
Woodstock.....	92	46	72.3	1.22	East Tawas.....	95	40	67.0	2.41
<i>Massachusetts.</i>					<i>Eden.....</i>				
Amherst ExSta (1).....	86	38	64.6	1.48	Evert.....	90	31	66.2	4.90
Amherst ExSta (2).....	88	40	66.5	1.53	Fairview.....	92	41	71.0	3.74
Andover.....	85	47	63.1	4.38	Fitchburg.....	95	36	70.8	4.58
Blue Hill (sum'it).....	83	48	61.4	1.85	Flint.....	92	37	70.2	2.35
Blue Hill (base).....	84	45	62.8	1.97	Fort Brady.....	87	34	61.3	4.60
Blue Hill (valley).....	86	40	63.2	1.90	Fort Mackinac.....	79	40	60.4	3.99
Boston.....					Frederick.....	95	39	72.2	3.99
Brewster.....	85	44	64.3	3.81	Fremont.....	95	42	70.2	2.86
Cambridge (1).....	84	46	63.2	2.80	Gaylord.....	90	35	63.6	1.75
Cambridge (2).....	85	47	64.4	3.51	Gladwin.....	95	35	67.4	2.28
Chestnut Hill.....	88	42	64.6	2.60	Grand Rapids.....	97	39	71.8	3.42
Clinton.....					Grape.....	99	36	70.9	3.02
Cotuit.....	83	45	62.6	3.68	Grayling.....	95	32	69.1	3.61
Deerfield.....	89	49	67.0		Gulliver Lake.....	90	42	64.3	5.31
Dudley.....	89	41	66.1		Hanover.....	94	40	70.7	3.41
Fall River (1).....	83	50	62.8	3.76	Harbor Springs.....	96	38	68.8	2.26
Fitchburg.....					Harrison.....	95	35	69.5	3.11
Fitchburg (2).....	86	43	63.2	1.96	Harrisville.....	90	32	61.6	2.68
Fort Warren.....	82	51	63.2	2.95	Hart.....	95	36	69.5	3.05
Framingham.....	88	42	65.4	1.97	Hastings.....	94	42	71.9	5.04
Gilbertville.....	87	39	62.4	2.17	Hayes.....	91	40	68.4	3.80
Groton (1).....	86	45	64.8	3.08	Highland Station.....	92	38	66.6	2.34
Heath.....	90	40	65.4		Hillsdale.....	93	44	72.3	2.59
Kendall Green.....	84	50	66.8	2.24	Howell.....	95	34	70.0	3.20
Lake Cochituate.....	89	41	65.4	1.78	Hudson.....	93	33	69.6	3.57
Lawrence.....	87	41	64.8	3.71	Ionia.....	95	40	67.6	3.52
Leicester.....	86	43	62.1	2.75	Ivan.....	96	33	69.5	2.99
Leominster.....					Jeddo.....	90	40	71.9	3.99
Long Plain.....	84	52	64.6	5.01	Kalamazoo.....	92	50	69.0	3.77
Lowell (1).....	86	45	64.3	3.52	Lansing.....	92	39	70.6	4.03
Lowell (2).....	88	44	63.2		Lathrop.....	90	40	68.0	4.23
Lowell (3).....	90	46	65.3		Madison.....	97	39	72.9	2.11
Ludlow (1).....	87	38	65.4	1.84	Marshall.....	97	47	71.9	3.85
Ludlow (2).....	86	37	62.6	2.87	May.....	90	42	69.7	3.71
Lynn.....	83	49	62.0	2.80	Montague.....	89	38	66.9	2.80
Mansfield.....	86	41	62.8	3.26	Mottville.....	95	37	72.1	5.21
Medford.....					Noble.....				
Middleborough.....	85	37	61.8	3.52	North Marshall.....	91	32	69.1	4.16
Milton.....	85	49	62.0	1.94	Olivet.....	91	39	68.8	2.77
Monson.....	87	36	62.4	2.23	Otaogo.....	96	36	71.6	6.30
Mount Nonotuck.....					Ovid.....	94	38	71.0	3.78
Mystic Lake.....					Parkville.....				
Mystic Station.....					Paw Paw.....	96	36	74.4	4.29
Nahant.....	84	48	62.3	3.71	Pontiac.....	87	45	69.2	5.04
New Bedford (1).....	84	48	61.8	5.02	Pulaski.....	92	42	70.8	3.45
New Bedford (2).....	84	44	63.8	5.53	Rawsonville.....	96	44	72.4	1.85
Newburyport (1).....	86	46	63.2	3.43	Romeo.....	93	39	69.4	2.88
Newburyport (2).....					Roscommon.....	93	31	67.8	2.63
Northampton.....	91	47	68.7	2.11	Saint Ignace.....	84	38	60.6	2.30
North Billerica.....	95	45	65.9	3.14	Saint John's.....	97	40	72.0	4.67
Plymouth.....	85	52	64.3	3.41	Sand Beach.....	99	37	64.5	3.34
Princeton.....					Stanton.....	95	35	69.6	6.05
Provincetown.....	83	44	62.8	3.46	Stockbridge.....				
Randolph.....					Thornville.....	91	42	71.7	3.39
Roberts' Dam.....					Vandana.....	92	40	71.7	3.24
Royalston.....	86	50	62.8	2.33	Venona.....				
Salem (1).....	87	50	62.8		Washington.....	89	39	68.7	3.68
Salem (2).....					Washington Creek.....	94	36	68.1	2.89
Somerset.....	92	48	67.8	4.58	West Branch.....	92	34	68.5	4.45
South Hingham.....					White Pigeon.....	90	40	71.9	4.95
Springfield Army.....	88	47	67.5	2.83	Williamston.....	90	40	70.0	5.07
Swampscott.....	84	50	63.8	1.18	Ypsilanti (1).....	90	37	68.5	2.09
Taunton (1).....	90	44	64.0	3.77	Ypsilanti (2).....	91	42	69.5	2.17
Taunton (2).....	88	44	64.7	3.89	<i>Minnesota.</i>				
Taunton (3).....	87	37	63.0	3.60	Alexandria.....				
Wakefield.....	96	42	63.0	3.13	Crookston.....	96	42	67.8	3.50
Walham.....					Farmington.....	92	54	69.3	8.20
Wellfleet.....	86	42	64.0	2.06	Fergus Falls.....				
Westborough.....	94	44	67.7	1.76	Fort Ripley.....	94	49	69.2	7.76
Williamstown.....	81	40	64.6	1.72	Fort Snelling.....	100	50	70.4	7.23
Winchester.....					Grand Meadow.....	94	49	69.1	5.19
<i>Mexico.</i>					Le Winnibogoshish.....	94	49	67.7	8.01
Leon de Aldemas.....	92	56	69.8	8.89	Leach Lake.....	94	37	67.7	8.50
<i>Michigan.</i>					Le Sueur.....	95	54	70.5	8.59
Adrian.....	96	37	71.5	2.61	Mankato.....	90	50	69.0	3.57
Allegan.....					Medford.....	91	42	67.8	9.64
Alma.....	94	38	70.6	3.78	Minneapolis.....	94	54	69.2	5.97
Ann Arbor.....	92	42	71.9	3.34	Montevideo.....	91	44	68.5	8.11
Arbela.....					Morris.....	92	48	69.4	4.38
					Northfield.....	92	52	68.8	10.29

Meteorological record of voluntary observers, &c.—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean.			Max.	Min.	Mean.	
<i>Minnesota—Cont'd.</i>					<i>Montana—Cont'd.</i>				
Orionville.....	0	0	0	<i>Ans.</i>	0	0	0	<i>Ans.</i>	
Pine River.....	94	50	67.4	2.56	Fort Maginnis A.....	85	36	55.8	3.11
Pokegama Falls.....	94	43	65.8	7.42	Fort Missoula.....	90	33	56.8	3.10
Red Wing.....	92	52	69.7	8.03	Fort Shaw.....	90	41	60.4	1.41
Redwood Falls.....					Galpin.....				
Rolling Green.....	90	52	69.1	7.78	Glendive.....		37	59.3	5.03
Saint Charles.....	93	54	67.0	12.00	Kintyre.....				
Sheldon.....		60	71.4	10.82	Martindale.....	92	32	58.8	1.89
Tracy.....				6.19	Powder River.....	91	41	64.8	3.84
<i>Mississippi.</i>					<i>Nebraska.</i>				
Aberdeen.....	98	60	77.6	4.05	Alliance.....	105	32	67.3	1.86
Agricultural College.....	95	65	81.6	3.20	Ansel.....	108	38	71.1	2.60
Batesville.....	98	64	80.9	2.83	Ashland.....	100	46	75.2	4.92
Booneville.....	98	60	81.0	4.75	Bassett.....	98	53	71.2	3.10
Brookhaven.....	98	62	79.4	6.31	Bingham.....	98	39	64.9	3.52
Canton.....	95	66	78.4	3.07	Culbertson (1).....				
Columbus (2).....	95	61	84.0	3.80	Culbertson (2).....	105	53	80.8	3.14
Corinth.....	98	50	79.0	3.20	David City.....	92	46	64.8	3.45
Edwardsville.....	98	65	81.9	3.32	De Soto.....	96	52	72.8	8.06
Fayette.....	95	65	79.9	4.13	Elwood.....	98	58	78.8	4.54
Greenville.....	96	66	82.0	2.31	Fairbury.....	96	79		
Hattiesburg.....	99	61	78.6	4.95	Fairfield.....	98	48	77.5	3.81
Hazlehurst.....	95	64	79.6	4.62	Fort Niobrara.....	100	35	66.0	3.00
Hernando.....	94	58	76.0	3.35	Fort Omaha.....	90	50	74.9	0.15
Holly Springs (1).....	94	55	80.6	3.05	Fort Robinson.....	99	36	67.2	0.60
Holly Springs (2).....	98	60	80.4	2.04	Fort Sidney.....	99	35	67.8	0.68
Jackson.....	98	60	80.8	2.37	Fremont.....	95	50	73.0	6.99
Kosciusko.....	94	63	78.8	1.08	Genoa.....	98	50	72.8	4.38
Lake.....	96	61	78.3	3.66	Gering.....	99	36	68.4	0.62
Logtown.....	94	69	79.6	4.88	Grant.....				4.61
Louisville.....	102	60	80.4	3.73	Hay Springs.....	102	36	65.0	4.55
Macon (2).....	100	48	78.6	1.45	Hebron.....	99	51	75.5	3.45
Moss Point.....	98	68	82.3	6.72	Holdrege.....	100	53	73.8	1.71
Natchez (1).....	91	67	79.0	5.58	Howe.....	98	53	70.4	3.75
Natchez (2).....	97	66	80.5	5.76	Imperial.....	103	58	79.5	3.24
Okola.....	103	62	82.2	2.44	Kennedy.....	101	44	68.6	6.66
Pearlington.....	90	74	81.5	5.07	Kimball.....	101	35	67.9	0.73
Port Gibson.....	95	61	79.4	3.02	Lexington.....	97	54	70.8	2.40
Portoto.....	94	64	78.5	3.47	Long Pine.....	103	50	73.1	...
Riemi.....	101	67	80.7	5.37	Marquette (1).....	101	48	...	2.60
Wadena.....	103	63	81.8	4.40	Miner.....	99	56	73.3	4.55
Washington.....	104	60	79.8	3.29	Nebraska City.....	92	59	73.9	5.21
Water Valley.....	104	60	81.6	3.50	North Loup.....	95	42	70.8	3.63
Waynesboro (1).....	94	64	80.2	3.41	Oakdale.....	97	45	71.1	3.23
Waynesboro (2).....	92	54	79.4	3.69	O'Neill.....	97	45	71.3	3.28
West Point.....	92	69	81.4	4.27	Ough.....				1.82
Yatco City.....				4.17	Palmer.....	96	52	71.8	2.40
<i>Missouri.</i>					<i>Nebraska.</i>				
Adrian.....	98	53	76.6	4.17	Plattsmouth.....				6.45
Austin.....	97	60	78.4	1.95	Ravenna.....	100	40	73.0	2.75
Appleton City.....	100	54	78.4	3.34	Syracuse.....	101	59	76.5	4.00
Bethany.....	94	60	80.1	3.75	Tecumseh.....	97	56	76.1	1.33
Boonville.....				2.48	Tekamah.....	94	55		
Bradyville.....	96	62	79.4	0.75	Theodore.....	108	56	78.4	2.00
Brunswick.....	97	53	76.9	2.65	Weeping Water.....	101	48	72.2	5.61
Carrollton.....	95	60	75.2	...	West Hill.....	96	55	70.4	4.36
Carthage.....	96	54	75.2	3.86	Weston.....	100	59	76.6	6.91
Cassville.....	95	50	73.9	2.12	West Point.....	91	63		5.95
Cenerville.....		45		1.80	Wilcox.....	105	43		8.99
Conception.....	95	50	76.4	2.70	<i>Nevada.</i>				
Craig.....	99	53	75.9	1.80	Ansin.....	85	31	58.6	0.05
Dunnegan.....	99	51	77.9	...	Belmont.....	90	50	69.6	0.00
Eldon.....	106	58	81.2	1.37	Belmont.....	83	33	59.3	T.
Excelsior Springs.....	100	45	74.8	4.25	Boonville.....	93	42	67.7	0.00
Fayette.....	100	51	77.1	1.38	Browns.....	95	48	74.5	0.00
Glasgow.....	97	53	76.4	1.59	Candelaria.....	87	35	62.9	...
Glenwood.....	97	44	76.79	3.77	Carlin.....	90	38	59.8	0.00
Grand Pass.....	96	55	76.3	1.76	Carson City.....	91	27	62.3	T.
Hannibal.....	98	54		3.50	Columbus Marsh.....	101	36	65.6	0.00
Harrisonville.....	96	58	75.0	2.35	Crane's Ranch.....				0.21
Hermann.....				3.27	Downeyville.....	92	67	65.0	T.
Ironton.....	95	62	77.6	1.40	Eldorado.....	109	69	84.5	0.00
Jefferson Barracks.....	100	52	77.9	1.22	Elko (1).....	94	38	59.5	0.00
Jerome.....				1.08	Ely.....	99	24	59.2	0.00
Kansas City.....	100	50	77.9	2.00	Eureka.....	91	39	60.1	T.
Lamar.....	100	50	75.9	1.30	Fenelon.....	98	43	65.9	0.00
Lamonte.....	104	60	80.9	0.57	Genoa.....	86	31	59.5	0.00
Liberty.....	94	60	79.0	...	Goldenshoe.....	88	46	69.0	0.00
Louisiana Bridge.....	103	49	78.7	2.78	Gold Mountain.....	87	36	68.8	0.00
New Frankfort.....	97	58	76.0	1.85	Halleck.....	92	35	63.9	0.13
New Haven.....	101	62	80.1	3.15	Hawthorne (1).....	98	52	71.1	0.00
Oak Ridge.....	103	60	76.5	0.70	Hot Springs (1).....	90	45	62.1	0.00
Oregon.....	97	50	76.8	2.53	Hot Springs (2).....	90	45	59.9	0.00
Platt River.....	96	46	76.8	...	Humboldt.....	86	40	62.8	0.00
Princeton.....	103	51	75.3	7.47	Lewers Ranch.....	90	30	57.6	0.00
Saint Charles (1).....				2.70	Palisade.....	88	38	62.9	0.00
Saint Joseph.....				5.97	Pioche.....				0.25
Sarcoux.....	95	50	75.0	4.00	Punch Bowl.....	81	26	55.8	0.00
Sedalia.....	99	53	80.5	1.11	Reno.....	99	44	63.9	0.00
Shelbina.....				3.30	Ruby Hill.....	78	24	51.8	0.30
Stellada.....		60	76.7	...	Tecoma.....	98	38	65.1	0.25
Warrensburg.....	98	56	76.3	1.00	Toano.....	87	44	64.1	0.25
Warrenton.....	99	59	79.2	2.26	Tuscarora.....	88	27	53.3	0.15
Willow Springs.....	105	50	78.9	1.69	Wadsworth.....	96	42	67.7	0.00
Withers Mill.....				3.95	Winemucca.....	88	39	65.4	0.00
<i>Montana.</i>						92	32	67.1	0.05
Blackfeet Agency.....	88	35	57.0	...	<i>Wyoming.</i>				
Camp Poplar River.....	91	38	63.9	1.78	Saint John's.....	68	40	54.8	2.78
Choteau.....	93	36	58.2	2.15	<i>New Hampshire.</i>				
Custer.....				3.56	Antrim.....				2.00
Fort Assiniboine.....	97	39	61.1	2.01	Belmont.....				1.65
Fort Custer.....	91	40	63.0	2.36	Berlin Falls.....	86	26	58.4	...
Fort Keogh.....	95	39	65.0	5.40	Berlin Mills.....	87	29	57.8	4.29
Fort Logan.....	86	30	54.4	2.80	Concord.....	87	42	62.4	2.56
					East Canterbury.....	86	42	63.0	2.77
					Hanover (1).....	83	38	63.5	2.63

Table of miscellaneous meteorological data for June, 1890—Signal Service observations—Continued.

Stations and districts.	Elevation above sea-level, feet.	Pressure, in inches.		Temperature of air, in degrees Fahrenheit.							Mean temperature of the dew-point.	Mean relative humidity, per cent.	Precipitation, in inches.	Departure from normal precipitation.	Wind.			Cloudless days.	Partly cloudy days.	Cloudy days.	Days with rainfall.	Average cloudiness, tenths.	Precipitation data since opening of station.									
		Mean actual.	Mean reduced.	Monthly range.	Monthly mean.	Departure from normal.	Maximum.	Mean maximum.	Minimum.	Mean minimum.					Greatest daily range.	Least daily range.	Total movement, miles.						Prevailing direction.	Maximum velocity.	Miles per hour.	Direction.	Date	Length of record, years.	Greatest for month.	Year.	Least for month.	Year.
Ex. northwest-Con.																																
Fort Buford.....	1,900	27.86	29.84	0.71	65.1	+ 0.1	88	77.0	42	53.2	37	8	52.0	66.8	5.23	+ 1.92	6,906	se.	56	nw.	27	3	15	12	16	6.2	7.1	12	6.76	1888	0.93	1886
Fort Yates.....					69.4	+ 1.6	97	82.2	46	56.6	37	10			6.45	+ 3.58		se.				3	20	7	12			7	7.01	1888	0.57	1887
Upper Miss. Valley.																																
Saint Paul.....	831	29.01	29.89	0.78	69.8	+ 1.8	94	78.0	51	61.5	29	5	59.4	72.6	5.29	+ 0.71	4,740	se.	37	sw.	28	8	11	11	18	6.7	5.5	20	11.67	1874	1.61	1889
La Crosse.....	736	29.17	29.94	0.76	71.3	+ 2.3	95	80.3	50	62.3	29	6	61.3	74.8	5.91	+ 4.05	3,627	se.	28	n.	23	9	9	12	18	5.0	5.6	18	8.91	1890	0.98	1887
Davenport.....	613	29.29	29.93	0.71	74.4	+ 4.4	98	84.1	52	64.0	28	5	64.0	72.6	4.51	+ 0.18	3,843	sw.	54	sw.	5	12	8	10	17	5.0	5.5	20	8.43	1882	0.49	1886
Des Moines.....	869	29.00	29.91	0.68	73.2	+ 2.2	96	82.7	49	63.6	28	8	62.8	73.2	4.91	+ 1.21	5,738	sw.	45	sw.	5	13	10	7	11	5.8	4.3	12	15.79	1881	1.21	1886
Dubuque.....	651	29.24	29.94	0.79	73.6	+ 4.6	96	82.7	52	64.4	26	8	66.6	81.6	9.59	+ 4.55	3,243	se.	36	w.	24	9	8	13	15	3.5	8	17	9.59	1890	0.71	1886
Keokuk.....	613	29.31	29.95	0.64	76.2	+ 5.2	98	85.8	53	66.6	26	10	64.0	68.8	3.41	+ 1.79	3,877	sw.	40	se.	4	12	13	5	9	4.3	9	19	9.45	1882	1.21	1873
Cairo.....	359	29.62	30.00	0.40	79.4	+ 4.4	96	87.8	62	70.9	23	6	69.4	75.7	1.45	+ 3.03	5,048	sw.	27	sw.	11	6	20	4	4	3.5	5	19	8.70	1879	1.45	1880
Springfield, Ill....	644	29.30	29.97	0.55	76.0	+ 4.0	97	86.3	50	65.6	27	10	65.4	72.6	4.50	+ 1.20	4,104	sw.	28	n.	14	8	17	5	9	5.5	5	11	12.71	1882	2.47	1880
Saint Louis.....	571	29.41	30.01	0.53	79.4	+ 4.4	98	89.1	57	69.6	25	10	65.0	95.0	3.18	+ 1.06	7,537	sw.	38	w.	29	13	16	1	11	2.4	5.0	20	10.84	1875	2.00	1874
Missouri Valley.																																
Columbia.....				0.54	77.2	.....	100	89.5	48	64.9	32	14			3.40	.....	3,959	se.	48	se.	23	10	18	2	6	...	3.2	1	.....	.....	.....
Kansas City.....	963	28.93	29.92	0.63	77.0	.....	97	86.7	55	67.4	28	12	62.0	63.0	1.94	.....	6,203	se.	30	se.	13	14	12	4	7	3.6	3.7	2	3.11	1889	1.94	1890
Springfield, Mo....	1,356	28.59	29.94	0.48	75.6	.....	96	86.1	54	65.1	27	12	63.7	69.7	1.33	.....	6,058	se.	42	nw.	14	12	16	2	7	2.9	3.2	4	6.11	1888	1.33	1890
Leavenworth.....	842	29.06	29.93	0.65	77.0	+ 3.0	97	87.2	51	66.9	28	9	66.8	73.1	1.93	+ 4.07	5,646	se.	30	nw.	16	9	12	9	5	4.7	3.6	20	10.84	1883	1.69	1886
Topeka.....					75.6	.....	99	88.4	44	63.3	38	14			1.60	.....		se.				9	18	3	5	...		4	9.57	1887	1.60	1890
Omaha.....	1,113	28.75	29.91	0.71	74.4	+ 2.4	98	84.5	52	64.3	30	8	61.2	67.3	5.04	+ 0.90	6,028	se.	38	e.	22	10	13	7	12	5.4	3.8	20	12.70	1883	1.50	1886
Crete.....					74.2	.....	98	85.9	44	62.6	33	10			4.48	.....		se.				17	11	2	9	...		3	4.48	1890	2.78	1889
Valentine.....	2,613	27.22	29.87	0.71	68.8	.....	98	80.6	44	56.9	34	12	52.6	61.2	3.09	+ 0.28	10,053	se.	52	nw.	27	14	11	5	13	4.1	4.8	5	3.89	1887	2.25	1886
Sioux City.....	1,158	28.67	29.87	0.80	72.4	.....	96	82.5	50	62.4	29	8	60.3	69.8	3.61	.....	6,831	se.	38	se.	3	10	13	7	12	5.1	4.3	1	.....	.....	.....
Fort Sully.....	1,600	28.17	29.83	1.02	70.2	.....	99	82.1	49	58.3	39	9	56.4	66.6	6.41	+ 2.92	9,455	se.	66	w.	4	4	16	10	16	5.5	5.6	13	6.41	1890	1.64	1889
Huron.....	1,307	28.47	29.85	0.78	69.2	+ 2.2	94	81.1	45	57.2	35	7	58.2	70.8	5.87	+ 2.19	6,762	se.	60	n.	2	8	17	6	13	4.2	4.5	9	5.87	1890	1.04	1889
Yankton.....	1,232	28.56	29.84	0.77	70.9	+ 0.9	93	80.6	50	61.2	29	7	59.4	68.5	3.59	+ 0.84	7,267	se.	70	se.	23	7	17	6	13	5.3	4.9	18	9.21	1875	1.03	1888
Northern Slope.																																
Ft. Assiniboine..	2,690	27.11	29.88	0.72	62.2	- 0.8	96	74.9	40	49.6	40	12	42.2	55.9	2.05	+ 1.57	8,382	sw.	76	nw.	9	7	10	13	11	4.4	6.6	8	9.33	1887	0.24	1889
Fort Custer.....	3,040	26.77	29.86	0.60	63.0	- 2.0	91	75.8	40	50.2	39	3	46.8	62.0	2.44	+ 0.39	5,598	nw.	44	nw.	13	10	8	12	12	5.5	6.2	11	4.91	1888	0.90	1889
Fort Maginnis....	4,340				57.2	- 1.8	86	67.6	30	46.7	40	10			3.60	+ 0.44		nw.				10	7	13	15	...		8	7.31	1888	0.61	1889
Helena.....	4,069	25.85	29.96	0.56	58.9	- 1.1	91	69.9	40	47.9	36	9	34.8	46.8	1.83	+ 0.63	5,461	sw.	40	sw.	16	6	11	13	19	5.7	6.5	11	4.46	1885	0.40	1889
Rapid City.....	3,280	26.55	29.83	0.70	65.7	.....	99	77.6	45	53.8	34	5	46.2	53.1	3.77	+ 0.72	7,098	nw.	59	sw.	1	7	15	8	15	4.4	6.4	5	5.07	1882	2.97	1889
Cheyenne.....	6,105	24.62	29.87	0.50	61.0	- 1.0	90	76.6	30	45.4	40	17	27.6	35.2	0.65	+ 0.77	6,611	nw.	52	se.	26	19	5	6	7	2.0	5.4	20	3.67	...	0.07	1879
Fort McKinney..	5,000	24.92	29.83	0.60	60.2	.....	86	72.0	30	48.3	35	8	41.7	51.5	1.14	.....	6,614	n.	48	sw.	12	11	14	5	9	3.5	5.2	3	2.14	1888	1.14	1890
Fort Washakie...	5,580	24.45	29.91	0.54	59.0	.....	84	74.3	31	43.8	42	10	31.3	39.4	0.44	.....	5,458	sw.	36	sw.	20	14	13	3	3	2.9	5.3	4	2.60	1889	0.34	1888
North Platte.....	2,841	27.02	29.89	0.70	69.6	+ 0.6	98	82.3	39	56.9	38	13	54.4	63.2	2.06	+ 1.38	8,424	se.	46	se.	1	5	21	4	7	4.6	5.3	16	7.49	1883	0.49	1875
Middle Slope.																																

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Meteorological record of voluntary observers, &c.—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean			Max.	Min.	Mean	
<i>Michigan—Cont'd.</i>	°	°	°	<i>Ins.</i>	<i>Minnesota—Cont'd.</i>	°	°	°	<i>Ins.</i>
Allegan	94	42	69.6	1.29	Minneapolis*	95	58	71.0	1.90
Alma	94	42	69.6	1.41	Montevideo	93	50	71.0	1.88
Ann Arbor	91	50	72.4	0.93	Morris	92	50	71.2	4.00
Arbela	91	48	62.1	0.78	Northfield	94	51	71.6	0.82
Atlantic*	91	48	62.1	1.83	Ortonville†	91	46	69.7	0.88
Ball Mountain	91	43	68.9	2.18	Pine River	91	46	69.7	2.39
Bangor	100	30	73.7	0.90	Pokegama Falls	92	38	67.6	2.64
Bear Lake	90	38	66.6	2.49	Red Wing	93	49	72.1	1.80
Bellaire	94	41	66.6	2.12	Redwood Falls†	93	49	72.1	0.90
Bell Branch*	94	48	72.1	0.69	Rolling Green	93	58	72.5	0.25
Benton Harbor	98	41	73.9	2.60	Saint Charles*†	94	53	69.0	1.15
Berrien Springs (2)	96	42	71.4	1.90	Sheldon*	94	53	69.0	0.37
Berlin	96	42	71.4	1.73	Tracy†	94	53	69.0	0.05
Big Rapids	93	40	69.4	1.98	<i>Mississippi.</i>				
Birmingham	94	44	71.3	1.14	Aberdeen	98	56	77.5	3.49

Meteorological record of voluntary observers, &c.—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean			Max.	Min.	Mean	
<i>Montana—Cont'd.</i>	°	°	°	<i>Ins.</i>	<i>Nevada—Cont'd.</i>	°	°	°	<i>Ins.</i>
Camp Poplar River	99	43	71.4	0.73	Wells	100	60	77.0	0.00
Choteau	97	40	67.0	0.08	Winnemucca	103	52	80.6	0.00
Custer	99	43	70.2	0.00	Yount's Ranch	106	66	83.6	0.40
Fort Assinniboine	99	43	70.2	0.58	<i>New Fbundland.</i>				
Fort Custer	100	48	74.2	0.06	Saint John's	76	49	61.5	2.08
Fort Keogh	105	41	73.3	0.05	<i>New Hampshire.</i>				
Fort Logan†	94	35	63.0	0.25	Antrim				4.56
Fort Missoula	104	38	67.0	0.32	Belmont				4.00
Fort Shaw	101	43	70.0	0.70	Berlin Falls	90	35	62.2	.....
Glendive†	105	50	76.3	1.06	Berlin Mills*	90	30	60.4	4.09
Martinsdale	102	33	69.2	0.14	Concord	91	45	68.8	3.98
Virginia City	92	30	67.8	0.24	East Canterbury	89	53	70.1	5.84
<i>Nebraska.</i>					Hanover (1)	91	40	67.5	3.85
Alliance	105	41	74.6	2.28	Hanover (2)	94	38	67.0	3.23
Ansley†	109	47	78.9	1.00	Lake Village				4.58

Table of miscellaneous meteorological data for July, 1890—Signal Service observations—Continued.

Stations and districts.	Elevation above sea-level, feet.	Pressure, in inches.			Temperature of air, in degrees Fahrenheit.										Wind.		Precipitation data since opening of station.																
		Mean actual.	Mean reduced.	Monthly range.	Monthly mean.	Departure from normal.	Maximum.	Mean maximum.	Minimum.	Mean minimum.	Greatest daily range.	Least daily range.	Mean temperature of the dew-point.	Mean relative humidity, per cent.	Precipitation, in inches.	Departure from normal precipitation.	Total movement, miles.	Prevailing direction.	Maximum velocity.		Cloudless days.	Partly cloudy days.	Cloudy days.	Days with rainfall.	8 a. m. Average cloudiness, tenths.	Length of record, years.	Greatest for month.	Year.	Least for month.	Year.			
																			Miles per hour.	Direction.													
<i>Extreme Northwest.</i>																																	
Moorhead	926	28.94	29.92	0.67	70.9	+ 1.7	98	81.3	46	57.1	41	8	59.7	73.8	2.15	- 1.08	7,049	se.	75	nw.	7	14	14	3	12	2.7	3.8	10	7.32	1884	1.95	1889	
Saint Vincent	804	29.05	29.92	0.80	68.8	+ 3.8	95	80.2	43	57.3	39	10	57.2	69.0	2.32	- 0.58	5,905	w.	28	se.	7	14	13	4	11	3.6	3.5	10	4.28	1887	0.45	1881	
Bismarek	1,681	28.17	29.93	0.69	71.0	+ 1.0	98	84.3	44	57.7	45	12	61.5	57.5	1.14	- 1.31	7,496	n.	48	e.	7	25	4	2	7	2.6	2.3	16	4.49	1887	1.14	1890	
Fort Buford	1,900	27.92	29.89	0.69	71.4	+ 2.4	100	86.0	44	56.8	47	13	50.2	53.4	1.06	- 1.22	6,805	se.	40	nw.	29	10	17	4	9	4.1	4.7	12	4.17	1880	0.56	1886	
Fort Yates					74.0	+ 0.0	100	88.4	50	59.7	40	18	2.51	0.87				se.															
<i>Upper Miss. Valley.</i>																																	
Saint Paul	831	29.07	29.96	0.57	71.9	+ 0.1	94	81.4	51	62.4	29	6	60.2	70.2	1.87	- 1.42	5,222	se.	25	se.	28	6	21	4	13	4.4	5.2	20	9.32	1879	0.52	1877	
La Crosse	736	29.22	30.00	0.51	73.2	+ 0.2	97	82.9	52	63.6	30	11	60.0	67.0	1.46	- 3.36	4,585	s.	42	w.	14	16	9	6	7	4.3	3.8	18	11.03	1883	1.46	1890	
Davenport	613	29.35	29.98	0.44	76.2	+ 1.2	97	86.5	55	65.9	29	11	58.6	57.6	0.85	- 2.69	5,486	nw.	30	sw.	30	14	13	4	7	3.2	2.5	20	9.30	1875	0.43	1886	
Des Moines	869	29.07	29.97	0.46	76.9	+ 0.9	101	87.3	55	66.5	34	9	59.6	59.1	1.10	- 2.54	6,879	sw.	38	sw.	30	21	6	4	8	3.7	3.0	12	7.16	1884	0.27	1886	
Dubuque	651	29.30	30.00	0.46	75.4	+ 1.4	98	85.5	54	65.3	30	10	65.8	75.4	1.21	- 3.67	3,684	nw.	30	nw.	8	10	17	4	6	3.5	2.5	18	10.53	1881	0.59	1886	
Keokuk	613	29.36	29.99	0.42	78.0	+ 1.0	104	89.1	54	67.0	34	11	60.8	59.5	2.49	- 1.62	4,166	e.	36	sw.	14	19	8	4	6	2.9	2.7	20	12.70	1875	0.04	1871	
Cairo	359	29.64	30.02	0.39	79.0	+ 0.0	95	88.5	59	69.4	27	12	65.6	68.2	1.62	- 2.09	4,092	sw.	48	ne.	17	14	10	7	5	3.4	4.1	20	9.88	1875	0.18	1871	
Springfield, Ill.	644	29.33	30.00	0.38	75.9	+ 1.1	100	87.1	51	64.7	32	13	61.4	64.4	2.14	+ 0.04	4,164	s.	36	e.	14	17	11	3	8	3.4	4.2	12	4.59	1888	0.05	1886	
Saint Louis	571	29.44	30.04	0.36	79.8	+ 0.2	98	89.7	57	70.0	29	4	60.4	55.2	0.37	- 3.48	7,329	sw.	37	sw.	12	18	11	2	4	2.9	4.0	20	9.49	1875	0.37	1890	
<i>Missouri Valley.</i>																																	
Columbia					79.0	.....	104	92.8	54	65.2	38	9			4.97	.....	3,478	s.	21	sw.	30	10	15	6	7	....	4.3	1				
Kansas City	963	28.98	29.96	0.32	80.5	.....	102	91.2	59	69.8	30	10	62.8	59.8	1.96	.....	5,638	s.	28	e.	14	17	12	2	4	3.7	3.5	3	4.53	1888	1.90	1890
Springfield, Mo.	1,356	28.62	30.00	0.30	78.2	.....	95	88.4	56	68.1	30	10	65.6	70.9	4.25	.....	5,324	s.	30	s.	8	12	18	1	8	3.6	3.4	4	6.53	1889	0.50	1888
Leavenworth	842	29.10	29.97	0.33	80.6	+ 2.6	102	91.8	58	69.5	33	11	65.2	63.9	1.61	- 2.99	5,217	s.	24	sw.	7	9	11	11	6	4.0	3.5	20	9.92	1872	0.55	1886	
Topeka					80.9	.....	102	95.1	54	66.7	41	14			2.30	.....																
Omaha	1,113	28.82	29.98	0.44	78.8	+ 1.8	105	88.7	55	68.8	32	11	62.2	62.6	3.74	- 1.86	6,334	s.	26	s.	28	16	10	5	8	4.0	2.6	20	10.35	1884	0.54	1874	
Crete					79.4	.....	103	92.1	52	66.8	33	15			2.47	.....																
Valentine	2,613	27.29	29.91	0.61	75.6	.....	103	88.9	54	62.2	42	10	57.0	59.9	4.39	+ 2.11	8,269	se.	48	s.	10	19	11	1	11	3.3	2.9	5	4.83	1888	2.04	1886
Sioux City	1,158	28.74	29.93	0.54	76.0	.....	104	87.0	50	64.9	34	7	61.4	64.7	2.59	.....	7,044	s.	42	s.	5	16	10	5	7	4.0	3.6	2	3.31	1889	2.59	1890
Fort Sully	1,600	28.24	29.90	0.68	77.3	.....	103	90.4	55	64.2	39	12	57.4	56.6	0.25	- 2.30	8,385	se.	42	nw.	28	14	11	6	4	4.4	3.4	13	6.48	1872	0.25	1890
Huron	1,307	28.54	29.91	0.69	73.8	+ 1.8	103	87.9	47	59.6	41	12	57.8	62.6	1.41	- 3.00	6,497	se.	36	s.	10	15	13	3	7	3.0	3.3	10	5.88	1882	1.41	1890	
Yankton	1,232	28.63	29.90	0.64	75.9	+ 1.9	98	86.4	51	65.4	32	4	61.6	65.2	4.27	+ 0.44	6,734	se.	47	sw.	5	17	9	5	9	3.8	3.2	18	7.54	1879	0.69	1886	
<i>Northern Slope.</i>																																	
Ft. Assiniboine	2,690	27.15	29.90	0.56	70.6	+ 2.6	99	84.9	44	56.3	38	16	39.8	39.8	0.58	- 1.98	8,893	sw.	45	w.	29	14	10	7	8	3.6	4.1	10	9.67	1884	0.24	1883	
Fort Custer	3,040	26.80	29.86	0.58	74.2	+ 2.2	100	90.1	48	58.4	42	18	44.4	40.0	0.06	- 1.08	5,392	sw.	36	n.	25	20	10	1	1	2.5	4.2	11	2.51	1880	0.00	1890	
Helena	4,069	25.88	29.93	0.55	70.6	+ 3.6	96	83.5	48	57.8	38	8	31.8	31.2	0.58	- 0.51	5,075	w.	48	sw.	15	19	6	6	8	3.7	4.7	11	3.25	1884	0.27	1887	
Rapid City	3,280	26.62	29.85	0.62	74.5	.....	99	87.9	55	61.1	38	13	45.6	41.0	0.13	.....	7,447	sw.	36	se.	9	10	16	5	6	4.3	4.7	5	4.52	1889	0.13	1890
Cheyenne	6,105	24.12	29.92	0.35	70.2	+ 2.2	92	84.4	48	55.9	38	18	40.3	42.7	3.64	+ 1.92	6,942	nw.	41	s.	28	16	12	3	10	2.1	5.4	20	4.47	1875	0.43	1877	
Fort McKinney	5,000	24.99	29.82	0.50	72.2	.....	97	84.9	51	59.6	42	11	44.5	38.9	0.88	.....	8,249	n.	54	nw.	15	19	11	1	8	2.3	4.2	3	2.89	1888	0.59	1889
Fort Washakie	5,580	24.53	29.92	0.49	69.4	.....	93	86.3	37	52.5	50	22	47.2	48.4	0.97	.....	4,872	sw.	47	w.	25	20	8	3	5	2.0	4.0	4	0.97	1890	0.31	1889
North Platte	2,841	27.08	29.94	0.49	77.4	+ 3.4	103	91.1	53	63.6	38	12	58.6	59.4	0.39	- 2.41	7,769	e.	36	s.	10	8	20	3	8	5.6	4.5	16	8.47	1879	0.39	1890	
<i>Middle Slope.</i>																																	
Colorado Springs					72.0	.....	94	86.4	50	57.5	39	16	47.6	49.4	1.64	- 1.61																
Denver	5,281	24.85	29.92	0.40	74.8	+ 1.8	97	89.1	54	60.5	36	14	44.9	44.2	0.79	- 0.94	4,811	sw.	48	w.	29	1	21	9	8	2.6	7.0	19	4.32	1875	0.33	1877	
Pueblo	4,753	25.30	29.90	0.35	76.5	.....	100	91.6	54	61.4	42	21	46.7	43.4	0.56	.....	5,307	nw.	36	nw.	1	4	25	2	6	2.5	7.0	3	1.33	1888	0.50	1890

Table of miscellaneous meteorological data for August, 1890—Signal Service observations—Continued.

Stations and districts.	Elevation above sea-level, feet.	Pressure, in inches.			Temperature of air, in degrees Fahrenheit.							Mean temperature of the dew-point.	Mean relative humidity, per cent.	Precipitation, in inches.	Departure from normal precipitation.	Wind.				Total movement, miles.	Prevailing direction.	Maximum velocity.			Cloudless days.	Partly cloudy days.	Cloudy days.	Days with rainfall.	Average cloudiness, tenths.		Length of record, years.	Precipitation data since opening of station.			
		Mean actual.	Mean reduced.	Monthly range.	Monthly mean.	Departure from normal.	Maximum.	Mean maximum.	Minimum.	Mean minimum.	Greatest daily range.					Least daily range.	Miles per hour.	Direction.	Date.			Cloudless days.	Partly cloudy days.	Cloudy days.					8 a. m.	8 p. m.		Greatest for month.	Year.	Least for month.	Year.
Extreme Northwest.																																			
Moorhead	935	28.97	29.97	0.72	62.7	- 2.3	93	75.4	36	50.0	42	7	53.4	74.6	3.69	+ 0.55	7,917	n.	40	s.	11	13	6	12	11	4.4	4.1	10	6.17	1884	0.92	1888			
Saint Vincent	804	29.09	29.96	0.81	62.1	- 2.9	92	72.8	30	47.4	45	10	48.0	70.8	2.40	- 0.14	6,589	se.	35	nw.	2	11	10	10	10	4.4	4.6	10	7.18	1884	0.41	1886			
Bismarck	1,681	28.18	29.66	0.72	66.8	- 0.2	103	81.9	40	51.7	45	18	54.5	69.8	0.69	- 1.84	7,997	n.	46	nw.	7	26	4	1	5	3.3	2.4	16	6.55	1876	0.30	1882			
Fort Buford	1,900	27.94	29.93	0.63	66.2	- 1.8	98	81.2	36	51.1	43	14	42.5	49.9	0.22	- 1.24	7,074	nw.	46	n.	1	11	16	4	4	4.9	4.3	12	3.91	1887	0.16	1882			
Fort Yates					69.0	- 1.0	101	85.4	40	52.7	44	20			1.71	- 0.93		se.				9	21	1	0			7	4.83	1886	0.28	1889			
Upper Miss. Valley.																																			
Saint Paul	831	29.12	30.01	0.65	65.0	- 5.0	92	75.0	43	55.1	33	5	58.2	70.2	2.20	- 1.45	4,971	se.	26	nw.	7	11	12	8	12	4.0	5.3	20	8.74	1875	1.22	1883			
La Crosse	736	29.28	30.06	0.52	66.2	- 3.8	96	76.6	43	55.9	31	3	54.0	70.4	3.47	- 0.10	3,184	s.	40	n.	3	12	9	10	12	3.5	3.8	18	5.97	1876	1.31	1879			
Davenport	613	29.40	29.04	0.50	70.2	- 1.8	97	80.4	49	60.1	34	7	55.2	63.8	1.66	- 2.40	4,109	e.	26	nw.	3	13	14	4	12	4.5	3.1	20	12.68	1885	0.51	1873			
Des Moines	869	29.13	30.04	0.48	69.6	- 3.4	97	80.5	48	58.7	31	8	55.6	67.7	3.35	- 0.13	4,958	se.	32	sw.	2	20	5	6	14	3.8	4.5	13	6.69	1880	1.10	1886			
Dubuque	651	29.35	30.05	0.50	68.8	- 2.2	99	78.8	48	58.8	31	6	61.2	79.2	6.00	+ 2.33	2,977	se.	21	nw.	3	10	12	9	13	4.3	3.7	18	8.02	1885	0.26	1889			
Keokuk	613	29.41	30.05	0.47	71.2	- 2.8	98	81.5	49	60.9	34	6	56.2	64.0	1.77	- 1.44	3,545	nw.	24	se.	23	14	11	6	11	3.7	3.5	20	5.98	1885	0.54	1873			
Cairo	359	29.69	30.07	0.43	75.0	- 2.0	91	83.3	56	66.8	23	7	65.0	76.8	5.16	+ 2.49	4,049	s.	32	w.	1	10	6	15	12	4.2	4.5	20	7.05	1879	0.11	1881			
Springfield, Ill.	644	29.37	30.05	0.49	71.0	- 3.0	97	81.2	48	60.7	32	7	58.3	68.2	1.03	- 1.78	4,934	*	24	nw.	9	16	6	9	6	4.3	4.7	12	4.82	1885	0.78	1889			
Saint Louis	571	29.48	30.09	0.52	74.7	- 3.3	97	83.0	54	66.4	23	7	59.0	63.6	2.43	+ 0.01	6,531	sw.	33	sw.	9	12	9	10	6	4.3	4.4	20	6.66	1888	0.07	1873			
Missouri Valley.																																			
Columbia				0.35	72.3		99	86.2	47	58.4	38	19	65.1	73.4	5.47		3,436	se.	22	s.	25	16	7	8	9		3.4	2	5.47	1890	0.56	1889			
Kansas City	963	29.02	30.02	0.39	73.7		97	83.3	56	64.1	26	8	60.8	69.9	6.60		4,516	se.	30	s.	25	12	16	3	14	5.1	4.5	3	9.18	1888	4.64	1889			
Springfield, Mo.	1,356	28.64	30.03	0.37	73.6		94	82.6	56	64.6	24	8	64.6	80.6	8.21		5,182	se.	36	sw.	25	7	18	6	13	4.7	3.5	4	8.21	1890	2.14	1882			
Leavenworth	842	29.15	30.02	0.43	74.2	- 1.8	98	84.3	55	64.0	30	7	62.9	74.4	5.85	+ 2.37	3,957	se.	28	s.	3	7	9	15	13	5.0	5.1	20	9.32	1888	0.18	1879			
Topeka					74.8		101	87.6	51	62.1	36	17			5.60			se.				9	20	2	13			4	7.23	1888	5.39	1887			
Omaha	1,113	28.88	30.05	0.47	71.0	- 3.0	99	81.2	48	60.9	32	8	57.0	67.8	1.02	- 2.53	5,081	s.	28	se.	3	7	18	6	11	3.4	5.5	20	7.77	1875	0.95	1882			
Crete					72.4		100	85.3	45	59.5	44	15			2.93			se.				11	13	7	10			4	5.86	1889	1.67	1888			
Valentine	2,613	27.32	29.97	0.55	69.3		98	82.2	44	56.4	40	10	53.6	64.8	2.04	- 0.36	7,235	s.	58	n.	24	12	19	0	12	3.4	3.1	5	2.94	1887	0.34	1889			
Sioux City	1,158	28.80	30.01	0.58	69.0		93	80.5	43	57.4	34	10	54.6	66.0	3.64		5,947	s.	36	se.	23	11	10	10	12	4.2	4.2	2	3.64	1890	1.19	1889			
Fort Sully	1,600	28.28	29.94	0.66	71.8		102	85.5	43	58.0	40	10	50.5	53.8	0.61	- 1.46	7,917	se.	56	nw.	7	10	15	6	9	4.2	4.4	14	4.50	1885	0.20	1882			
Huron	1,307	28.59	29.97	0.75	68.0	- 1.0	102	83.2	35	52.7	45	8	49.9	58.7	0.73	- 3.03	8,342	n.	42	nw.	7	14	13	4	9	3.8	3.5	10	6.31	1881	0.66	1889			
Yankton	1,232	28.69	29.97	0.68	69.6	- 2.4	99	81.2	41	58.0	36	6	54.2	63.9	2.16	- 0.90	6,679	se.	38	sw.	7	13	14	4	9	3.8	3.8	18	6.21	1885	0.44	1878			
Northern Slope.																																			
Ft. Assiniboine	2,690	27.18	29.96	0.55	64.8	- 1.2	94	78.3	40	51.3	43	8	41.4	51.6	1.26	- 0.53	7,751	nw.	43	w.	7	15	7	9	9	4.1	3.7	11	2.61	1884	0.10	1889			
Fort Custer	3,040	26.83	29.91	0.60	68.6	- 1.4	96	84.3	39	52.8	44	11	42.6	44.6	0.31	- 1.89	5,309	se.	33	n.	22	16	10	5	3	3.4	4.3	11	2.55	1880	0.03	1881			
Helena	4,069	25.90	29.98	0.50	66.8	+ 0.8	91	79.4	45	54.3	37	10	30.0	34.2	0.23	- 0.65	5,083	sw.	42	sw.	14	12	11	8	4	3.5	4.9	10	1.86	1887	0.03	1886			
Rapid City	3,280	26.65	29.91	0.55	69.6		101	82.3	46	57.0	46	8	45.4	48.6	1.83		6,579	w.	60	sw.	10	6	18	7	10	4.5	5.4	5	4.76	1888	0.11	1882			
Cheyenne	6,105	24.13	29.98	0.32	64.2	- 1.8	89	77.5	39	50.8	39	8	40.2	50.6	3.18	+ 1.64	6,693	*	37	sw.	2	12	12	7	14	3.9	4.9	20	3.18	1890	0.23	1882			
Fort McKinney	5,000	25.02	29.86	0.40	67.6		92	79.0	44	56.2	30	8	44.2	44.2	0.88		6,913	*	40	nw.	7	15	14	2	8	2.9	3.8	3	3.51	1888	0.14	1889			
Fort Washakie	5,580	24.54	29.98	0.40	63.8		91	79.5	39	48.2	47	3	43.2	51.2	0.73		4,095	sw	36	w.	16	18	10	3	6	3.2	4.3	4	1.94	1888	0.25	1882			
North Platte	2,841	27.12	30.01	0.54	71.4	+ 0.6	100	85.3	45	57.4	45	13	54.0	62.2	2.42	- 0.22	6,915	se.	40	n.	5	6	21	4	10	4.6	4.2	16	5.05	1877	0.16	1879			
Middle Slope.																																			

Neah Bay, Wash. At Port Moody, B. C., 12.90 fell, and at Juneau, Alaska, the monthly rainfall was 11.31. In extreme west Fla., east-central N. J., extreme west N. Y., on Long Island, in R. I., central Mass., and west-central lower Mich., more than 10.00 was recorded. Over a greater part of southern Cal., and thence northward over the central and western parts of the state to the 40th parallel, no precipitation was reported; and the monthly precipitation was less than 0.50 generally in northern and eastern Cal., southern Oregon, Nev., west Utah, and west Ariz. Over a greater part of the northern and middle plateau regions, the east and west parts of the southern plateau, over a large portion of the eastern slope of the Rocky Mountains, in the middle Missouri valley, in adjoining parts of east-central Mo. and west Ill., and in the Rio Grande Valley above Rio Grande City, Tex., less than 1.00 fell.

The precipitation was generally in excess of the average for October east of the Missouri and Mississippi rivers, except over the north part of the upper lake region and thence eastward to the west coast of the Gulf of Saint Lawrence, in the middle Mississippi valley, on the N. C. coast, and over south Fla. To the west of the Mississippi and Missouri rivers the precipitation was deficient, save on the north Pacific coast, from southeast Wyo. west of south over Ariz., in east-central Tex., south-central Ind. T., and at Rio Grande City, Tex. The greatest excess in precipitation occurred on the southeast New England coast, where it exceeded 6.00; in extreme northwest Wash. and the adjoining part of British Columbia, where it ranged from 4.00 to nearly 6.00; in east-central Tex., where it exceeded 5.00; in extreme west Fla., where it exceeded 4.00; and in northeast Iowa, at Rio Grande City, Tex., and on Prince Edward Island, Gulf of Saint Lawrence, where it exceeded 3.00. The most marked deficiency in precipitation occurred at Key West, Fla., where it was nearly 4.00, and the deficiency was more than 2.00 at Eastport, Me., Quebec, on the N. C. coast, at Springfield, Ill., and Escanaba, Mich.

Considered by districts the average percentage of the normal in districts where the precipitation was in excess was about as follows: east Gulf states, 174 per cent.; New England, 170 per cent.; lower lakes, 164 per cent.; middle Atlantic states, 155 per cent.; southern plateau, 137 per cent.; Ohio Valley and Tennessee, 128 per cent.; extreme northwest, 126 per cent.; Rio Grande Valley, 119 per cent.; west Gulf states, 116 per cent.; upper Mississippi valley, 108 per cent.; north Pacific coast, 103 per cent. In districts where the precipitation was deficient the percentage of the normal was about as follows: at Key West, Fla., 34 per cent.; at Spokane Falls, Wash., 49 per cent.; middle-eastern slope of the Rocky Mountains, 66 per cent.; Missouri Valley, 71 per cent.; and upper lakes and middle plateau, 96 per cent. For the middle Pacific coast, where trace of precipitation was reported for the current month, the normal is 1.06, and on the south Pacific coast, where the average was 0.02, the normal is 0.44. On the south Atlantic coast and on the northeast slope of the Rocky Mountains the precipitation for October, 1890, about equalled the October average.

For the period January to October, 1890, inclusive, the precipitation in the Ohio Valley and Tennessee, the lower lake region, and on the middle Pacific coast, averaged about one-fourth greater, and in New England and the west Gulf states, one-tenth to two-tenths greater than the average, while in the Rio Grande and Missouri valleys, the northeast and middle-eastern slopes of the Rocky Mountains, the middle plateau region, and on the south Pacific coast the precipitation averaged two-thirds to three-fourths of the normal amount for the period named.

The heaviest precipitation ever reported for October occurred at Newburyport and Somerset, Mass., Dyberry and Grampian Hills, Pa., Cumberland, Md., Pensacola, Fla., Grand Coteau, La., Cleveland, Ohio, Port Huron and Thornville, Mich., Fort Buford, N. Dak., Fort Assiniboine, Mont., and Yuma, Ariz., in 1890, when the excess above the normal varied from nearly 6.00 at Somerset, Mass., to nearly 1.00 at Fort Assiniboine,

Mont.; in south New England, eastern N. Y., Pa., and La., in 1877, when the excess varied from 4.00 to 6.00; in the middle and lower Ohio valleys and west Tennessee in 1883, when the excess varied from 3.00 to 6.00; in the upper Mississippi valley in 1881, when the excess varied from 2.00 to 5.00; and in Cal. in 1889, when the excess varied from 2.00 to 7.00.

The least precipitation reported for October occurred at Concordia, Kans., Abilene, Tex., Walla Walla, Wash., and San Francisco, Cal., in 1890, the deficiency varying from 1.15 at San Francisco, Cal., to more than 2.00 at Abilene, Tex.; in Me. in 1874, when the deficiency varied from 2.00 to 3.00; also from west Pa. over east Va., and in the lower Mississippi valley, in 1874; from the south Atlantic coast to the Mississippi River in 1886, when the deficiencies varied from 2.00 to 6.00; from the upper Mississippi valley and the west part of the upper lake region westward over N. Dak. and Mont. in 1889, when the deficiencies varied from 1.00 to 3.00. It will be noted in connection with the distribution of precipitation for October, 1889, that it was the heaviest ever reported for Cal., and the least ever noted over the northern part of the country from Wash. to the upper lakes.

DEVIATIONS FROM AVERAGE PRECIPITATION.

The following table shows for certain stations, as reported by voluntary observers, (1) the average precipitation for October 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 October, 1890; (4) the departure of the current month from the average; (5) and the extremes for October during the period of observation and the years of occurrence:

State and station.	County.	(1) Average for the month of Oct.	(2) Length of record.	(3) Total for Oct., 1890.	(4) Departure from average.	(5) Extremes for Oct.			
						Greatest.		Least.	
						Am't.	Year.	Am't.	Year.
Arkansas.									
Lead Hill.....	Boone.....	4.70	9	2.28	-2.42	18.11	1883	0.10	1886
California.									
Sacramento.....	Sacramento.....	0.80	54	0.01	-0.79	7.01	1889	0.00	*
Connecticut.									
Middlesex.....	Middlesex.....	3.91	29	7.52	+3.61	14.51	1869	0.89	1868
Georgia.									
Merritt's Island.....	Brevard.....	5.74	12	3.85	-1.89	11.94	1886	1.33	1889
Florida.									
Forsyth.....	Monroe.....	2.82	16	5.89	+3.07	7.86	1879	0.10	1884
Illinois.									
Peoria.....	Peoria.....	2.64	34	3.45	+0.81	5.68	1877	0.70	1860
Riley.....	McHenry.....	2.67	39	5.35	+2.71	6.81	1881	0.29	1867
Indiana.									
Logansport.....	Cass.....	2.84	14	2.82	-0.02	5.47	1881	1.00	1889
Veray.....	Switzerland.....	2.55	25	3.07	+0.52	7.07	1883	0.28	1879
Iowa.									
Cresco.....	Howard.....	2.29	19	3.98	+1.69	8.06	1881	0.13	1889
Monticello.....	Jones.....	2.84	35	6.82	+3.98	7.21	1881	0.43	1872
Logan.....	Harrison.....	2.51	22	1.87	-0.64	6.20	1881	0.40	1889
Kansas.									
Lawrence.....	Douglas.....	2.81	24	5.35	+2.54	6.96	1870	0.44	1876
Wellington.....	Sumner.....	3.46	11	2.63	-0.83	6.32	1882	1.29	1886
Louisiana.									
Grand Coteau.....	St. Landry.....	2.33	7	4.98	+2.65	4.98	1890	T.	1889
Maine.									
Orono.....	Penobscot.....	4.30	20	3.36	-0.94	7.51	1888	1.09	1882
Maryland.									
Cumberland.....	Allegany.....	2.22	19	6.65	+4.43	6.65	1890	0.00	1879
Massachusetts.									
Amherst.....	Hampshire.....	3.22	55	6.98	+3.76	11.36	1869	1.12	1876
Newburyport.....	Essex.....	3.67	12	7.20	+3.53	7.20	1860	0.81	1879
Somerset.....	Bristol.....	3.81	18	9.61	+5.80	9.61	1890	1.17	1879
Michigan.									
Kalamazoo.....	Kalamazoo.....	2.93	14	4.32	+1.39	6.57	1881	1.20	1886
Thornville.....	Lapeer.....	2.90	13	7.96	+5.06	7.96	1890	1.28	1889
Minnesota.									
Minneapolis.....	Hennepin.....	1.93	24	2.46	+0.53	4.92	1868	0.06	1889
Montana.									
Fort Shaw.....	LewinsClarke.....	0.51	21	2.20	+1.69	2.22	1883	0.00	1889
New Hampshire.									
Hanover.....	Grafton.....	3.42	49	4.75	+1.33	9.24	1869	0.32	1868
New Jersey.									
Moorestown.....	Burlington.....	3.29	27	5.76	+2.47	6.83	1877	0.47	1879
South Orange.....	Essex.....	3.52	30	6.98	+3.46	7.19	1877	0.27	1879
New York.									
Cooperstown.....	Otsego.....	3.29	36	5.91	+2.62	6.65	1857	0.88	1856
Palermo.....	Oswego.....	3.45	36	4.19	+0.74	7.90	1862	0.30	1882
North Carolina.									
Lenoir.....	Caldwell.....	3.40	19	4.40	+1.00	9.50	1885	0.70	1889
Ohio.									
N. Levesburgh.....	Champaign.....	2.28	18	3.45	+1.17	5.45	1881	0.45	1887
Wauseon.....	Fulton.....	2.62	18	3.76	+1.14	8.92	1881	0.93	1874, '89

Meteorological record of voluntary observers, &c.—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean			Max.	Min.	Mean	
<i>Kentucky—Cont'd.</i>	o	o	o	<i>Ins.</i>	<i>Massachusetts—Con.</i>	o	o	o	<i>Ins.</i>
Greensburgh f.	86	27	53.8	3.58	Leicester	72	32	46.6	7.92
Harrodsburgh f.	86	27	53.8	2.85	Leominster	72	31	50.6	10.66
Louisia f.	83	30	53.9	3.24	Long Plain*	72	31	50.6	7.71
Mount Sterling f.	86	33	55.2	4.37	Lowell (1)	75	29	48.0	7.71
Newport Barracks	86	33	55.2	4.37	Lowell (2)	75	27	47.3	7.71
Paducah f.	85	33	55.0	3.77	Lowell (3)	84	31	50.1	7.71
Pellville f.	85	33	55.0	2.77	Ludlow (1)	75	26	46.2	6.22
Princeton f.	86	23	55.4	2.15	Ludlow (2)	79	27	48.9	4.47
Richmond	82	29	55.2	2.71	Lynn	68	32	47.3	7.30
Shelbyville f.	86	29	54.1	3.28	Mansfield	77	31	49.0	7.59
<i>Louisiana.</i>					Medford	77	31	49.0	8.92
Abbeville*	87	45	69.7	8.04	Middleborough	74	25	48.2	10.55
Alexandria	90	36	67.0	3.93	Milton*	73	32	48.3	8.22
Amite City	92	35	67.6	3.57	Monson	75	22	47.5	5.81
Baton Rouge	92	34	67.6	6.09	Mount Nonotuck				6.91
Cameron f.	94	40	70.0	4.61	Mystic Lake				9.29
Cheneyville	88	34	65.4	2.99	Mystic Station				8.39
Clinton d.	87	43	67.8	4.55	New Bedford (1)	69	34	49.2	10.01
Coushatta (1) f.	90	35	65.9	5.22	New Bedford (3)	72	32	50.2	9.73
Coushatta (2)	90	35	65.9	5.22	Newburyport (1)	76	33	48.5	7.20
Crowley	89	40	70.4	7.52	Newburyport (2)				7.63
Delhi f.	88	44	68.8	4.52	Northampton	74	32	49.2	7.91
Edgard	88	44	68.8	4.52	North Billerica	75	28	48.6	7.75
Emilie	88	40	66.7	4.63	Plymouth	71	37	51.3	9.38
Farmerville	87	40	62.4	3.80	Princeton	73	30	46.8	10.04
Girard f.	86	37	66.8	4.98	Provincetown	70	38	50.7	6.78
Grand Coteau	86	37	66.8	4.98	Randolph				8.83
Homer	84	40	64.3	2.90	Roberts' Dam				8.89
Houma f.	88	42	65.0	6.13	Royalston*				11.62
Jackson Barracks	90	42	68.7	5.79	Salem (2)				7.35
Jeanerette	91	39	67.6	5.166	Somerset*	76	30	51.5	9.61
La Fayette f.	90	38	68.4	7.24	South Hingham				10.81
Lake Charles	83	40	62.3	3.50	Springfield Arm'y	73	31	49.6	6.70
Liberty Hill	90	35	64.0	5.79	Swampscott	70	33	50.3	6.17
Lulingd.	88	38	65.8	6.23	Taunton (1) f.	81	30	49.4	9.23
Mandeville	90	37	67.2	3.48	Taunton (2)	75	30	49.8	9.51
Marksville	87	33	65.6	3.26	Taunton (3)	78	26	48.1	10.44
Maurepas	88	40	65.6	4.95	Wakefield	76	27	47.5	9.58
Melville f.	89	36	66.2	4.38	Waltham				10.48
Minden	88	35	64.4	4.24	Wellesley	70	26	48.0	9.95
Monroe f.	86	37	63.8	4.04	Westborough*	77	27	49.6	10.85
New Iberia	90	41	69.0	5.42	Winchester*				8.39
Paincourtville	88	40	67.6	5.66	Worcester (1) *	73	32	47.2	9.24
Shell Beach	87	44	67.8	6.01	<i>Michigan.</i>				
Sugar Ex. Station	87	38	65.2	4.41	Adrian	82	30	50.9	7.44
Thibodeaux				5.92	Albion (1)	76	31	49.9	5.00
West End				2.65	Albion	79	28	49.7	5.03
<i>Maine.</i>					Alma	77	26	49.1	6.79
Bar Harbor	75	30	48.0	3.12	Ann Arbor	74	28	49.1	5.26
Belfast*	69	36	46.3	...	Arbela f.				6.57
Calais	76	27	45.6	2.27	Atlantic*	54	21	38.5	0.97
Cornish	73	27	46.4	6.11	Ball Mountain	70	27	48.1	6.75
Fairfield	75	20	45.2	3.45	Bangor	81	31	52.3	7.39
Farmington*				3.77	Bear Lake	71	25	47.7	5.39
Fort Preble	73	28	51.0	7.55	Bellaire	77	24	46.0	3.77
Kennebec Arsenal	72	23	49.9	2.41	Bell Branch	76	30	49.6	5.99
Kent's Hill	76	26	45.2	3.99	Benton Harbor	79	35	54.0	7.36
Lewiston	77	23	45.4	5.47	Berlin	79	26	50.2	11.02
Mayfield	76	21	41.4	3.45	Berrien Springs (2)				7.27
Orono f.	78	24	45.5	3.36	Birch Run				7.63
Petit Menan*	62	37	47.2	...	Birmingham	74	27	50.0	6.42
West Jonesport	66	30	47.1	...	Bronson	72	28	45.4	3.55
<i>Maryland.</i>					Calumet	68	27	43.8	2.42
Barren Creek Sp'gn	74	31	56.0	8.32	Cassopolis	76	25	50.6	6.39
Cumberland (1)	76	36	52.7	6.65	Caldwell	71	26	45.0	3.58
Cumberland (2)	78	38	56.2	5.96	Charlevoix	70	32	48.6	5.55
Fallston	73	32	52.0	7.08	Cheboygan	68	27	45.2	2.46
Fort McHenry	76	34	54.6	3.22	Chelsea	80	25	49.7	4.05
Frederick	76	37	56.4	5.54	Clinton	82	28	49.8	4.89
Gaithersburgh*				5.11	Colon	76	26	47.0	3.96
McDonogh	72	35	54.7	4.45	Concord	78	27	48.6	4.84
Mt. St. Mary's Col.	75	31	54.8	7.50	Crystal Falls	74	24	42.8	0.68
Woodstock	74	28	53.8	4.43	East Saginaw	70	24	45.2	5.22
<i>Massachusetts.</i>					Eden	70	25	50.2	5.19
Amherst	72	26	48.1	6.98	Evart	73	23	47.1	4.12
Amherst ExSta (1)	76	26	47.4	6.89	Fitchburg	77	25	48.8	5.76
Amherst ExSta (2)	78	26	48.5	7.13	Fort Brady	72	28	45.6	1.53
Andover	76	30	48.3	8.90	Fort Mackinac	62	29	46.2	3.04

Meteorological record of voluntary observers, &c.—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean			Max.	Min.	Mean	
<i>Michigan—Cont'd.</i>	o	o	o	<i>Ins.</i>	<i>Missouri—Cont'd.</i>	o	o	o	<i>Ins.</i>
Madison	78	30	50.6	5.37	Appleton City	83	27	55.6	2.56
Manton	71	26	44.3	3.58	Austin f.	88	32	57.4	3.50
Marshall	77	28	48.3	6.03	Bethany	86	24	50.6	3.45
May	75	25	50.0	5.76	Bradleyville	86	28	59.7	5.01
Montague	73	31	50.2	5.56	Brunswick	85	25	55.1	4.65
Mottville	79	29	50.8	4.25	Cape Girardeau	83	40	62.0	2.11
Noble				3.70	Carrollton	80	26	53.8	5.19
North Aurelius				5.49	Carthage	85	31	57.0	3.97
North Marshall	76	25	47.8	4.56	Cassville	82g	23g	53.8g	5.13
Northport	67	30	47.6	2.81	Centerville				1.20
Olivet	74	25	47.4	4.58	Columbia	85	23	54.6	
Otsego	80	28	49.4	5.23	Conception	80	22	53.4	3.23
Ovid	73	26	49.0	6.22	Concordia	86			2.50
Parkville				7.10	Dadeville	85	35	60.4	4.15
Paw Paw	78	30	49.5	59.4	Eldon*	90	30	58.1	0.88
Pontiac	70	31	50.6	6.76	Excelsior Springs*	81	20	52.9	5.05
Pulaski*	74	32	47.9	4.80	Fayette	86	22		2.30
Rawsonville*	74	29	51.2	5.85	Fortescue*	72	24	53.2	1.04
Romeo	75	26	49.2	7.93	Fox Creek	84	24	53.7	0.38
Roscommon	73	21	45.0	2.70	Glasgow	85	25	55.2	2.05
Saint Ignace	64	28	45.4	2.58	Gordonville*	84	26	57.0	0.90
Saint John's	74	27	50.3	4.59	Grand Pass	84	28	55.8	4.13
Sand Beach	67	28	46.9	7.37	Hannibal	90	26		1.25
Standish	79	25	49.0	3.30	Harrisonville*	80	25	54.6	2.37
Stanton	73	24	46.4	5.59	Hermann*	85	27	56.4	0.48
Stockbridge				4.59	Ironton*	87	24	58.1	1.50
Thornville	75	29	50.0	7.96	Jefferson Barracks	89	24	57.1	0.90
Vandalia	75	33	50.6	6.10	Jefferson City	85	28	58.4	1.05
Vienna				2.58	Jerome f.				0.51
Washington	74	26	50.1	6.67	Kansas City	88	26	56.3	4.71
Weldon Creek	74	24	47.1	5.89	Kidder		24	50.6	4.02
West Branch	72	26	47.0	3.55	Kirkville			49.8	3.68
White Pigeon	74	28	47.9	4.44	Ladonna				0.90
Williamston	74	32	50.9	5.47	Lamar	89	27	56.8	2.94
Ypsilanti (1)	70	26	47.1	5.53	Lamonte	90	34	60.1	1.02
Ypsilanti (2)*	72	28	49.4	5.44	Langdon				1.35
<i>Minnesota.</i>				2.61	Lebanon*	80	28	58.2	2.07
Alexandria				2.61	Liberty	82	24	54.6	3.46
Crookston	79	28	43.2	2.92	Louisiana Bridge f.				3.07
Fairbault	76	17	47.3	3.13	Marshall*	83	26	54.1	2.71
Farmington	66	24	45.1	2.42	Mexico				1.45
Fergus Falls				2.30	Miami (1)				4.21
Fort Ripley f.				2.30	New Frankfort	83	28	55.0	3.30
Fort Snelling	63	19	44.0	3.12	New Haven*	90	26	55.6	0.40
Grand Meadow	68	16	43.4	3.20	Oak Ridge*	84	30	60.3	2.00
L. Winnibigoshish	73	25	41.6	2.55	Oregon	78	27	54.4	1.06
Leech Lake	75	21	41.4	2.59	Pickering		19	49.2	2.07
Le Sueur d.	72	20	46.2	2.40	Platte River*	80	24	54.7	3.09
Mankato	70	23	47.7	2.57	Princeton*	85	24	55.2	4.90
Medford	72	15	44.3	2.89	Saint Charles (1)				0.85
Minneapolis*	70	20	44.5	2.46	Saint Charles (2)	88	24		1.55
Montevideo	71	20	46.1	1.90	Saint Joseph f.				2.99
Morris	75	24	44.0	1.64	Saint Louis	88	24	55.0	0.72
Northfield	69	19	45.0	0.31	Sarcoie	84	27	55.8	4.05
Ortonville f.				0.93	Sedalia	86	26	57.0	2.07
Pine River	75	22	40.8	2.62	Shelbina				3.40
Pokegama Falls	76	12	40.4	2.81	Steelville*	86	20	54.2	1.23
Red Wing	68	21	47.2	3.38	Stellada	86d	26	57.2	1.84
Redwood Falls				2.25	Warrensburg	84	29	55.3	2.25
Rolling Green	70	21	44.9	2.15	Warrenton		26	51.3d	0.89
Saint Charles * f.	76	19	42.0	4.10	Willow Springs f.	84	28	57.1	2.65
Sheldon*		21	44.2	3.24	Wither's Mills*	86	24		2.10
Tracy f.				0.71	<i>Montana.</i>				
<i>Mississippi.</i>					Camp Poplar River	86	21	45.0	1.25
Aberdeen	84	26	58.4	2.55	Choteau	78	21	45.6	0.87
Agricultural Col'ge	83	34	63.2	3.90	Custer				0.70
Batesville	87	29	62.0	2.84	Fort Assiniboine	71	22	45.6	1.42
Bay Saint Louis	86	49	70.0d	2.18	Fort Custer	88	24	48.9	0.90
Brookhaven f.	92	35	66.0	4.75	Fort Keogh	94	18	44.2	0.73
Canton f.	84	37	62.5	2.29	Fort Logan f.	67	11	41.0	0.30
Columbus (2)	88	33	63.0	3.22	Fort Missoula	70	20	42.7	0.66
Corinth	90	30	61.1	2.34	Fort Shaw	79	24	49.1	2.28
Edward f.	88	36	64.6	2.93	Glendive f.	82	26	48.2	1.25
Enterprise	86	31	62.0	4.36	Martinadale f.	70	20	42.3	0.17
Fayette	87	40	65.6	2.70	Virginia City	67	16	39.9	1.00
Greenville	85	41	63.2	2.79	<i>Nebraska.</i>				
Hattiesburgh	91	41	68.8	4.55	Alliance f.	79	8	45.6	0.14
Haslehurst f.	80	35	66.1	3.93	Ansel f.	81	20	46.8	2.20

Table of miscellaneous meteorological data for October, 1890—Signal Service observations—Continued.

Stations and districts.	Elevation above sea-level, feet.	Pressure, in inches.			Temperature of air, in degrees Fahrenheit.								Mean temperature of the dew-point.	Mean relative humidity, per cent.	Precipitation, in inches.	Departure from normal precipitation.	Wind.			Total movement, miles.	Prevailing direction.	Maximum velocity.		Date.	Cloudless days.	Partly cloudy days.	Cloudy days.	Days with rainfall.	Average cloudiness, tenths.		Length of record, years.	Precipitation data since opening of station.		
		Mean actual.	Mean reduced.	Monthly range.	Monthly mean.	Departure from normal.	Maximum.	Mean maximum.	Minimum.	Mean minimum.	Greatest daily range.	Least daily range.					Miles per hour.	Direction.	8 a. m.			8 p. m.	Greatest for month.						Year.	Least for month.		Year.		
<i>Extreme Northwest.</i>																																		
Moorhead	935	28.88	29.92	1.01	45.0	+ 1.8	76	53.2	24	36.4	34	5	36.0	78.6	2.10	+ 0.39	9,070	nw.	36	w.	14	1	12	18	11	7.2	7.8	10	4.04	1882	0.07	1889		
Saint Vincent	804	29.00	29.89	1.13	42.0	+ 2.0	78	49.6	23	34.4	33	5	32.7	78.8	2.79	+ 0.78	7,457	nw.	30	s. w.	4	2	8	21	9.6	8.7	9	11	4.60	1882	0.16	1887		
Bismarek	1,681	28.11	29.92	0.78	46.2	+ 2.2	84	56.2	22	36.1	35	5	39.4	70.4	1.37	+ 0.18	9,235	nw.	52	w.	4	21	3	7	11.4	3.4	5	17	3.88	1883	T.	1889		
Fort Buford	1,900	27.88	29.92	0.76	44.4	+ 1.4	80	54.8	25	34.1	38	4	33.0	73.8	2.45	+ 1.46	7,413	nw.	60	w.	4	2	15	14	12.6	8.6	4	12	2.45	1890	0.01	1889		
Fort Yates					47.6	+ 1.6	81	59.6	23	35.7	42	8			0.61	+ 0.01		nw.					3	21	7	3		9	1.08	1883	0.21	1889		
<i>Upper Miss. Valley.</i>																																		
Red Wing	758	29.23	30.07	0.69	40.8	.....	62	48.8	22	32.9	27	6	31.3	74.0	0.19	.....		nw.					5	5	3	3.4	6.3	8				
Saint Paul	831	29.04	29.94	1.10	46.4	+ 1.6	71	53.3	22	39.4	27	4	36.8	76.4	2.79	+ 0.77	4,913	*	29	sw.	14	5	11	15	12.6	7.5	3	20	4.44	1881	0.06	1889		
La Crosse	736	29.18	29.98	1.03	48.8	+ 1.2	74	57.2	23	40.4	33	4	40.4	80.0	5.14	+ 2.68	3,719	n.	31	w.	14	6	6	19	15.6	8.5	2	18	7.56	1881	0.06	1889		
Davenport	613	29.31	29.98	0.88	52.1	+ 0.9	81	60.1	25	44.1	26	6	41.7	74.6	3.63	+ 0.56	5,515	nw.	38	n.	25	6	14	11	12.5	6.4	8	20	7.17	1884	0.61	1872		
Des Moines	869	29.05	29.98	0.85	51.5	+ 1.5	79	60.9	22	42.1	32	5	40.0	74.1	4.48	+ 0.36	5,688	nw.	32	n.	25	14	7	10	12.5	5.3	5	13	6.45	1881	0.52	1889		
Dubuque	651	29.25	29.97	0.98	50.6	+ 0.4	75	58.4	26	42.8	28	7	44.3	86.9	6.43	+ 3.29	2,586	nw.	30	w.	14	5	10	16	16.6	0.5	4	18	6.70	1881	0.66	*		
Keokuk	613	29.35	30.01	0.84	54.1	+ 0.1	86	63.0	22	45.2	27	5	42.8	73.9	2.44	+ 0.96	4,270	nw.	36	w.	18	11	10	10	7.5	1.4	2	20	8.01	1881	0.28	1879		
Cairo	359	29.04	30.02	0.66	58.0	+ 2.0	84	65.5	32	50.5	25	3	48.8	79.3	3.04	+ 0.09	4,895	n.	40	sw.	13	10	10	11	11.5	0.3	8	20	6.97	1883	0.38	1887		
Springfield, Ill.	644	29.29	29.98	0.77	54.4	+ 1.6	88	63.5	23	45.4	29	3	43.2	74.4	1.30	+ 2.46	7,025	nw.	48	n.	18	9	13	9	8.5	2.5	4	12	10.02	1881	0.80	1886		
Saint Louis	571	29.41	30.03	0.75	57.3	+ 1.7	89	65.3	29	49.3	26	3	44.2	68.0	0.86	+ 1.94	8,657	sw.	42	w.	13	14	6	11	9.5	1.3	5	20	7.51	1885	0.55	1872		
<i>Missouri Valley.</i>																																		
Columbia					56.1	88	68.5	22	43.7	39	10	46.2	73.4	2.10	5,255	n.	36	nw.	25	10	11	10	8	4	1	2	2.50	1889	2.10	1890	
Kansas City	963	28.98	30.01	0.71	56.2	.....	82	65.9	30	46.5	32	3	43.7	71.4	5.08	.....	5,649	n.	30	n.	26	13	8	10	8.3	7.3	9	3	5.08	1890	1.57	1889
Springfield, Mo.	1,350	28.59	30.03	0.67	56.3	.....	84	65.4	29	47.2	31	6	44.8	75.5	3.97	.....	6,902	se.	36	sw.	13	12	10	9	11.4	3.3	0	5	7.62	1882	0.08	1887
Leavenworth	842	29.11	30.00	0.72	55.8	+ 0.2	79	66.2	29	45.4	39	5	43.0	71.9	3.86	+ 0.50	4,528	nw.	24	n.	8	12	6	13	8.4	3.4	0	20	8.31	1883	0.72	1875		
Topeka					55.6	.....	82	68.1	26	43.0	42	5			2.62	.....		n.					12	15	4	8	.....	4	3.39	1887	1.34	1889
Omaha	1,113	28.81	30.01	0.81	52.2	+ 1.8	76	62.2	26	42.2	34	5	39.1	69.4	1.09	+ 1.81	5,654	n.	36	nw.	18	12	9	10	9.4	4.3	7	20	5.80	1877	0.34	1889		
Crete					53.2	.....	82	67.1	25	39.3	41	9			1.64	.....		n.					14	8	9	6	.....	4	2.03	1888	0.37	1889
Valentine	2,613	27.27	30.03	0.72	48.7	.....	80	62.5	19	34.9	46	11	33.6	65.6	0.64	+ 0.05	8,807	w.	48	nw.	13	9	13	9	5.3	6.3	3	5	2.12	1889	0.27	1886	
Sioux City	1,158	28.72	29.98	0.88	50.2	.....	72	60.9	24	39.6	41	4	36.0	67.8	1.84	.....	6,492	*	40	n.	25	7	14	10	9.5	1.3	5	2	1.84	1890	0.21	1889
Fort Sully	1,600	28.24	29.95	0.84	49.6	.....	85	60.8	21	38.5	49	3	31.7	59.7	0.54	+ 0.16	8,025	nw.	42	n.	28	8	12	11	6.5	6.5	3	15	1.51	1874	0.02	1872	
Huron	1,307	28.54	29.95	0.87	46.8	+ 0.2	79	59.9	14	33.7	51	5	31.4	65.9	0.61	+ 1.10	8,723	se.	42	nw.	25	11	16	4	6.4	1.4	1	10	3.37	1882	0.29	1888		
Yankton	1,232	28.64	29.97	0.84	47.3	+ 1.5	75	61.2	22	38.3	47	3	38.4	75.8	0.92	+ 0.68	6,917	nw.	39	nw.	25	12	10	9	9.4	9.2	9	18	3.93	1882	0.14	1875		
<i>Northern Slope.</i>																																		
Fort Assiniboine	2,690	27.13	29.97	0.77	45.6	+ 2.6	71	56.7	22	34.5	40	8	30.8	65.3	1.47	+ 0.97	9,822	sw.	48	sw.	21	6	7	18	8.6	4.6	7	11	1.47	1890	T.	1889		
Fort Custer	3,040	26.82	29.98	0.74	48.4	+ 1.4	74	60.6	24	36.1	44	3	30.4	60.4	0.98	+ 0.03	5,737	sw.	41	n.	24	9	8	14	7.5	2.5	3	12	0.44	1879	0.24	1885		
Helena	4,059	25.87	30.04	0.64	46.2	+ 2.2	69	54.8	26	37.6	35	5	21.0	43.1	0.55	+ 0.53	5,994	sw.	36	sw.	7	7	12	12	7.6	0.6	6	10	2.04	1881	0.14	1889		
Rapid City	3,280	26.60	29.99	0.75	48.8	.....	79	61.0	25	36.7	40	10	28.0	52.6	0.56	+ 0.10	6,477	w.	38	nw.	13	6	20	5	8.4	8.4	6	5	0.71	1881	0.43	*	
Cheyenne	6,105	24.02	30.03	0.59	45.4	+ 0.4	69	57.1	22	33.7	36	8	20.2	47.6	0.76	+ 0.07	9,122	nw.	47	w.	7	13	7	11	9.4	8.4	4	20	2.58	1889	0.00	1876		
Fort McKinney	5,000	24.94	29.99	0.70	46.5	.....	71	56.5	28	36.5	34	8	29.0	60.2	1.20	.....	6,844	n.	48	nw.	13	13	10	8	8.4	2.4	1	3	1.20	1890	0.05	1888
Fort Washakie	5,580	24.48	30.06	0.60	41.7	.....	71	54.7	17	28.7	39	5	24.2	57.6	1.82	.....	3,786	sw.	40	sw.	7	16	9	6	6.3	9.4	2	4	1.82	1890	0.36	1888
North Platte	2,841	27.08	30.04	0.75	50.9	+ 0.9	81	60.8	21	35.0	50	12	29.3	55.8	0.84	+ 0.34	7,152	w.	44	nw.	13	12	12	7	4.3	9.3	8	17	3.47	1883	0.13	1878		
<i>Middle Slope.</i>																																		
Colorado Springs					49.4	.....	74	64.0	22	34.7	43	14	19.6	44.6	0.40	.....		n.					20	4	7	5	2	6	2.08	1889	0.13	1875
Denver	5,281	24.20	30.01	0.68	40.4	+ 0.6	75	61.6	25	35.2	41	0	22.5	44.8	0.64	+ 0.00	4,722	ne.	30	ne.	20	14	12	3	5.3	2.3	3	10	2.15	1877	0.12	1872		

Temperature.—Maximum, 81, at Springdale, 12th; minimum, 19, at Springdale, 28th; greatest monthly range, 62, at Springdale; least monthly range, 42, at Union City.

Precipitation.—Greatest monthly, 6.49, at Covington; least monthly, 0.00, at Parkersville and Dare.

Wind.—Prevailing directions, north and west.—*J. D. Plunket, M. D., Nashville, director; H. C. Bate, Signal Corps, assistant.*

TEXAS.

Temperature.—Maximum, 90, at Gallinas, 8th; minimum, 14, at Coldwater, 10th; greatest monthly range, 63, at Coldwater; least monthly range, 29, at La Grange.

Precipitation.—Greatest monthly, 5.27, at Weatherford; least monthly, 0.00, at La Grange.—*D. D. Bryan, Galveston, director; I. M. Cline, Sergeant, Signal Corps, assistant.*

WISCONSIN.

Temperature.—The mean was over 3 above the normal; maximum, 70, at Hayward, 20th; minimum, 7, at Hayward, 8th, and at Red Wing, Minn., 10th; greatest monthly range, 63, at Hayward; least monthly range, 26, at Cadiz.

Precipitation.—The average was slightly below the normal; greatest monthly 2.98, at Delavan; least monthly, 0.38, at Saint Paul, Minn.

Wind.—Prevailing direction, northwest.—*R. E. Kerkam, Milwaukee, Sergeant, Signal Corps, in charge.*

NOTES AND EXTRACTS.

EVAPORATION.

[By Assistant Professor T. ROWELL.]

In Table I are given depths of evaporation for the months, in inches, as measured by a pan evaporimeter and by a Piche evaporimeter, at Sweetwater Dam, San Diego Co., Cal. The results are communicated by John E. Boal, voluntary observer. The results with the Piche were derived by taking the quantity of water evaporating from a wetted paper surface as one and one-third of the evaporation from an equal water surface. The evaporation from the pan, as shown by the table, is 1.12 times the evaporation given by the Piche. It may be concluded from this that in the long run, in the course of a year, the Piche gives a good approximation to the actual evaporation taking place.

In Table II are given the depths of evaporation observed at a number of stations in 1889 and 1890 with Piche evaporimeters.

In Tables III and IV are given depths of evaporation measured by pans. These values have been courteously communicated by the Hon. J. W. Powell, director of the U. S. Geological Survey.

TABLE I.—Comparison (in inches) of evaporation from a pan and as measured with a Piche evaporimeter at Sweetwater Dam, San Diego Co., Cal.

Month.	1889.		1890.	
	Pan.	Piche.	Pan.	Piche.
January			1.91	2.49
February			1.80	2.01
March			3.28	4.40
May			5.50	3.92
July	5.22	4.02		
August	7.26	4.99	7.87	4.86
September	7.81	7.46	6.48	5.31
October	4.52	3.57	5.49	5.99
November	3.26	0.59		
December	0.95	1.59		
Sums	32.72	28.22	32.33	29.88
Ratios	1.16		1.08	

TABLE II.—Evaporation (in inches) measured by Piche evaporimeter.

Place.	1889.				1890.			
	June.	July.	August.	September.	June.	July.	August.	September.
Boston, Mass.	4.1	3.5	3.4	3.0	4.8	5.4	4.7	3.1
New York City	3.6	3.9	3.8	2.7	5.6	4.5	3.6	2.6
Washington City	3.6	3.5	3.4	3.1				
Buffalo, N. Y.	2.5	3.7	4.5	3.6	3.0	4.7	3.9	2.8
Cincinnati, Ohio	4.2	5.6		4.1				
Memphis, Tenn.	4.7	4.2	4.9	4.1	3.8	5.9	4.7	3.2
New Orleans, La.	8.2	8.7	8.9	9.4				
Chicago, Ill.	3.7	5.4	6.4	4.9				
Saint Louis, Mo.	3.6	4.4	5.0					
Keeler, Cal.	9.8	14.2	12.1	8.8				
Yuma, Ariz.	13.5	14.1	11.7	8.9	16.3	11.8		
El Paso, Tex.	19.0	16.3	17.5	11.9				
Dodge City, Kans.	5.1	6.2	7.1	5.2				
San Antonio, Tex.	3.6	6.2	4.1	2.9				
Omaha, Neb.	7.1	6.6	6.9	6.2	7.0	9.4	7.0	5.9
Denver, Colo.	7.1	9.6	9.8	7.4	11.6	12.7	8.1	8.1
Saint Vincent, Minn.	9.8	5.8	5.8		3.3	4.5	4.1	
Helena, Mont.	9.0	10.5	11.3	8.4	6.0	9.9	8.7	
Boise City, Idaho	8.4	10.6						
Albuquerque, N. Mex.	9.7	9.8	9.4	7.5				

TABLE III.—Evaporation (in inches) measured with pan in 1889.

Place.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
Boseman, Mont.								3.4	4.6	4.5	1.9	
Great Falls, Mont.												
Springdale, Mont.								6.8	7.1			
Livingstone, Mont.										3.2	2.9	
Hogan, Mont.												
Fort Douglas (Salt Lake City), Utah.								10.5	5.7	4.9	1.0	
Nephi, Utah.												
Cherry Creek, Colo.						3.9	5.0	4.6	2.9			
Canon City, Colo.						5.1	7.9	8.6		4.2	2.6	
Lamar, Colo.								7.1		4.6		2.1
Embudo, N. Mex.									7.3			
Fort Bliss (El Paso), Tex.	3.0	2.9	3.6	4.9								
Tempe, Ariz.						10.9	10.7	9.6	11.4	6.8	4.6	2.8
Blood's, Cal.								13.8	14.1	11.0	4.4	
Lake Eleanor, Cal.								7.9				
Tuolumne (Meadow's), Cal.								7.3				
Lake Tonaigo, Cal.									5.9			
Little Yosemite, Cal.									5.7			
Provo City, Utah.									7.3			

TABLE IV.—Evaporation (in inches) measured with pan in 1890.

Place.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
Boseman, Mont.						2.6						
Fort Douglas (Salt Lake City), Utah.				3.7	4.1	5.1	7.4	6.5	4.6	2.1	1.2	
Canon City, Colo.												
Fort Bliss (El Paso), Tex.	2.0	2.0	3.8	4.8	5.3	7.3	6.0				3.7	
Tempe, Ariz.					5.8	5.5	6.6	11.5	5.8	5.3		
Florence, Ariz.					5.8	8.2	11.5	13.5				
Yuma, Ariz.	2.0	2.8				7.2	8.5	7.2	7.0			

Meteorological record of Army post surgeons, voluntary, and other co-operating observers, November, 1890.

Stations.	Temperature (Fahrenheit.)			Precip'n.	Stations.	Temperature (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean.			Max.	Min.	Mean.	
Alabama.	0	0	0	Ina.	Arizona—Cont'd.	0	0	0	
Bermuda *†	81	30	56.4	T.	Benson	80	30	56.4	
Citronelle	85	32	58.6	1.40	Hisbee†	73	34	53.5	
Columbiana†	80	25	52.6	0.00	Calabasas	73	34	53.5	
Decatur (1)†			0.00		Casa Grande	76	34	55.5	
Decatur (2)†	78	23	53.8	0.18	Chino	76	34	55.5	
Double Springs†	68	28	48.7	1.10	Chiri Cahua M's				
Enfauila†	80	36	60.3	1.00	Cottonwood				
Evergreen†	81	28	59.0	0.05	Dragon†				
Fort Deposit.	81	30	59.6	0.03	Dragon Summit	76	34	55.5	
Greensborough	80	32	59.1	0.91	Dos Cabezas†				
Livingston (1)†	81	29	59.3	0.67	Farley's Camp				
Livingston (2)†	80	27	57.6	0.08	Fort Apache	79	34	56.5	
Marion†	81	27	57.6	0.20	Fort Bowie	73	34	55.5	
Mt. Vernon B'ks.	85	28	59.8	0.47	Fort Grant	73	34	55.5	
Opelika†	78	29	57.6	0.09	Fort Huachuca	77	34	56.5	
Selma (2)†	83	30	52.3	0.00	Fort Lowell				
Tuscumbia (1)†	74	29	53.7	0.58	Gila Bend (1)†	80	34	56.5	
Tuscumbia (2)†	78	26	55.1	0.35	Gila Bend (2)†	83	34	56.5	
Union Springs	78	39	62.5	0.60	Grand Central Mill				
Uniontown	81	31	59.4	1.79	Holbrook†	73	34	55.5	
Valley Head†	82	23	50.2	0.35	Lochiel†	74	34	56.5	
Alaska.					Mariopa	80	34	56.5	
Juneau	60	30	39.2	18.46	Mineral Park				
Killsnoo	47	30	36.8	8.80	Mount Huachuca	74	34	55.5	
Arizona.					Natural Bridge				
Antelope Valley				2.70	New River†	76	34	56.5	
Ariz. Canal Co. Dam.	93	39	62.4	1.85	Oro				

Meteorological record of voluntary observers, &c.—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean			Max.	Min.	Mean	
<i>Michigan—Cont'd.</i>	o	o	o	<i>Ins.</i>	<i>Missouri—Cont'd.</i>	o	o	o	<i>Ins.</i>
Bawsonville*.....	68	14	43.4	2.85	Glenwood.....	74	24	42.6	1.54
Romeo.....	63	20	37.9	2.86	Gordonville*.....	74	26	49.6	1.60
Saint Ignace.....	45	20	33.3	2.05	Grand Pass.....	76	24	44.6	2.48
Saint John's.....	63	24	39.4	1.83	Hannibal.....	74	26	44.6	1.80
Sand Beach.....	64	23	37.6	2.54	Harrisonville†.....	70	22	43.3	3.46
Standish.....	50	12	33.0	2.12	Hermann*.....	70	28	41.8	1.12
Stanton.....	63	20	37.1	4.30	Jefferson Barracks.....	78	25	48.7	2.10
Stockbridge.....	.....	.....	.....	2.58	Jefferson City.....	77	28	47.8	1.81
Thornville.....	65	23	39.5	2.70	Jerome†.....	.....	.....	.....	1.05
Vandalia.....	62	24	41.4	2.16	Kansas City.....	78	24	45.4	2.78
Vienna.....	.....	.....	.....	2.25	Kidder.....	.....	28	40.0	1.90
Washington.....	63	19	39.8	2.47	Laddonia.....	.....	.....	.....	0.18
Weldon Creek.....	57	25	37.0	1.57	Lamonte.....	80	28	45.7	1.48
West Branch.....	59	21	35.4	2.11	Lebanon*.....	76	30	51.4	2.28
White Pigeon.....	.....	.....	.....	1.60	Liberty.....	74	21	43.2	2.55
Williamston.....	62	26	42.6	2.93	Louisiana Bridge†.....	.....	.....	.....	1.45
Ypsilanti (1).....	63	11	36.9	2.68	Marshall* (1).....	76	25	44.0	2.97
Ypsilanti (2)*.....	65	16	37.4	2.38	Marshall (2).....	78	23	44.0	.....
<i>Minnesota.</i>	.....	.....	.....	.....	Marshfield.....	76	33	49.4	.....
Alexandria†.....	.....	.....	.....	0.81	Mexico.....	.....	.....	.....	2.06
Crookston.....	60	4	30.8	0.17	New Haven*.....	86	26	44.8	1.60
Faribault.....	66	3	35.0	0.59	Oak Ridge*.....	76d	30	55.6d	4.05
Farmington.....	54	8	34.7	0.50	Oregon.....	73	21	43.6	1.36
Fergus Falls†.....	.....	.....	.....	0.51	Pickering.....	.....	14	36.5	0.89
Fort Ripley†.....	.....	.....	.....	0.67	Platte River*.....	64	20	43.8	1.56
Fort Snelling.....	61	7	32.6	0.82	Princeton*.....	70	23	43.6	1.50
Grand Meadow.....	60	6	31.4	0.34	Saint Charles (1).....	.....	.....	.....	1.00
L. Winnibigoshish.....	56	5	30.0	0.40	Saint Charles (2).....	79	25	47.4	1.56
Leech Lake.....	59	—4	29.4	0.41	Saint Joseph†.....	.....	.....	.....	1.27
LeBauer*.....	59d	3e	34.9e	0.85	Sarcoxie.....	76	26	46.6	2.89
Mankato.....	62	9	36.8	0.52	Sedalia.....	78	24	46.3	1.89
Medford.....	62	—1	33.6g	0.75	Shelbina.....	.....	.....	.....	2.40
Minneapolis*.....	55	8	34.0	0.39	Steelville*.....	72	20	45.4	0.83
Montevideo.....	69	4	34.6	0.43	Stellada.....	.....	21	46.2	1.80
Morris.....	59	3	31.8	0.50	Warrensburg.....	74	26	49.2	2.92
Northfield.....	60	2	34.2	0.60	Warrenton.....	.....	29	45.0f	1.22
Ortonville†.....	.....	.....	.....	0.50	Willow Springs†.....	75	26	50.4	4.40
Pine River.....	60	—7	29.6	0.34	Windsor.....	71	21	46.8	1.80
Pokagama Falls.....	59	—7	29.3	0.59	Wither's Mills*.....	78	26	47.1	1.90
Red Wing.....	56	7	37.1	0.72	<i>Montana.</i>	.....	.....	.....	.....
Redwood Falls†.....	.....	.....	.....	0.77	Blackfeet Agency.....	67	4	40.0	0.35
Rolling Green.....	56	6	33.3	0.30	Camp Poplar River.....	65	8	35.3	0.13
Saint Charles*†.....	62	8	35.2	1.00	Choteau.....	72	4	42.8	0.50
Sheldon*.....	.....	12	32.0	1.17	Custer.....	.....	.....	.....	0.20
Tracy†.....	.....	.....	.....	0.04	Fort Assiniboine.....	68	9	40.6	0.17
<i>Mississippi.</i>	.....	.....	.....	.....	Fort Custer.....	74	10	39.9	1.61
Aberdeen.....	78	24	52.9	0.00	Fort Keogh.....	72	8	35.9	0.37
Agricultural College.....	79	32	58.3	0.01	Fort Missoula.....	60	10	33.1	0.60
Batesville.....	79	29	54.2	2.49	Fort Shaw.....	72	8	41.7	0.61
Bay Saint Louis.....	78	43	64.6	1.00	Glendive†.....	68	14	38.8	0.29
Booneville.....	75	35	59.1	3.18	Powder River.....	69	5	36.4	0.30
Brookhaven†.....	85	27	60.4	1.95	Virginia City.....	59	4	35.0	0.06
Canton†.....	79	32	57.9	0.31	<i>Nebraska.</i>	.....	.....	.....	.....
Calmar.....	82	28	56.6	0.06	Allamore.....	.....	.....	.....	0.45

Meteorological record of voluntary observers, &c.—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean			Max.	Min.	Mean	
<i>Nebraska—Cont'd.</i>	o	o	o	<i>Ins.</i>	<i>New York—Cont'd.</i>	c	o	o	<i>Ins.</i>
West Hill.....	65	10	36.5	0.96	Akron.....	.....	.....	.....	4.16
West Point.....	.....	.....	.....	1.31	Alfred Centre.....	63	12	35.5d	1.60
Whitman*.....	72	16	35.9	0.40	Apulia.....	.....	.....	.....	2.86
Wilcox.....	.....	.....	.....	1.05	Arcade (1).....	64	12	35.9	3.59
York.....	.....	.....	.....	1.05	Ardenia*.....	59	21	41.6	0.90
<i>Nevada.</i>	.....	.....	.....	.....	Arkwright.....	58	19	38.0	.....
Battle Mountain.....	67	18	38.2	0.00	Au Sable Forks.....	.....	.....	.....	2.48
Beowawe* (1).....	70	10	36.6	0.00	Avon.....	.....	.....	.....	2.56
Browns.....	66	26	40.1	0.00	Baldwinsville.....	.....	.....	.....	4.34
Carlisle.....	64	4	27.2	0.00	Bethlehem Centre.....	.....	.....	.....	1.67
Elko (1).....	68	10	32.2	0.00	Blood's Depot.....	.....	.....	.....	2.47
Fenelon.....	71	20	36.3	0.00	Boyd's Corners*.....	65	18	40.7	1.12
Golconda.....	72	16	34.5	0.00	Brockport.....	68	18	37.8	3.98
Halleck.....	62	3	29.2	0.00	Brookfield.....	61	3	33.7	3.31
Hawthorne (1).....	65	35	46.5	0.00	Canton†.....	68	8	33.2	4.06
Hot Springs (1).....	69	15	33.4	.....	Central Park, N. Y.....	69	19	43.9	0.71
Humboldt (1)*.....	65	15	39.5	0.00	Chenango Forks.....	.....	.....	.....	1.70
Palisade*.....	72	12	34.8	0.20	Cherry Creek.....	.....	.....	.....	4.87
Reno*.....	66	20	40.0	0.00	Chittanooga.....	.....	.....	.....	4.55
Tecoma.....	65	18	31.7	0.00	Cooperstown.....	63	8	34.7	3.17
Toano.....	67	8	39.6	0.00	David's Island.....	70	11	40.8	0.69
Wadsworth.....	68	20	38.9	0.05	De Kalb Junction.....	.....	.....	.....	3.72
Wells.....	78	12	32.4	0.05	Demster.....	.....	.....	.....	4.06
Winnemucca.....	73	15	34.4	0.00	Dunkirk (1).....	64	20	41.3	.....
<i>New Hampshire.</i>	.....	.....	.....	.....	Easton.....	.....	.....	.....	1.30
Antrim.....	.....	.....	.....	1.55	Fleming*.....	64	11	38.6	1.93
Belmont.....	.....	.....	.....	1.68	Fort Columbus.....	70	20	44.8	0.98
Berlin Falls.....	54	2	28.5	.....	Fort Hamilton.....	69	20	44.6	0.60
Berlin Mills*.....	55	2	29.6	3.25	Fort Niagara.....	63	24	41.8	2.79
Concord.....	64	8	35.6	1.49	Fort Porter.....	62	25	40.4	0.45
East Canterbury.....	58	10	31.8	1.69	Fort Schuyler.....	69	16	42.9	0.88
Hanover (1).....	53	8	32.6	1.71	Fort Wadsworth.....	70	19	43.7	0.92
Hanover (2).....	64	8	34.2	1.86	Geneva.....	66	19	38.9	2.46
Lake Village.....	.....	.....	.....	1.83	Hammondsport.....	66	13	40.8	1.54
Littleton.....	55	8	31.2	2.83	Honeymead Brook*.....	62	14	36.9	0.79
Manchester (1).....	58	8	37.0	1.39	Italy Hill.....	61	16	34.7	.....
Mine Falls.....	.....	.....	.....	1.52	Ithaca.....	66	18	39.4	1.93
Nashua*.....	60	8	36.6	1.30	Keene Valley.....	59	7	29.6	3.02
Newton.....	62	9	36.6	1.40	King's Station.....	.....	.....	.....	2.22
North Conway.....	58	10	32.4	1.72	Le Roy.....	63	14	37.2	3.08
Pennichuck Station.....	.....	.....	.....	1.22	Liberty.....	.....	.....	.....	1.44
Plymouth.....	54	8	30.9	2.05	Lowville.....	54	6	31.0	4.79
Stratford.....	61	8	32.0	3.30	Lyndonville.....	.....	.....	.....	4.22
Walpole.....	65	9	33.1	0.45	Lyons.....	63	22	38.9	2.81
West Milan.....	59	4	30.4	3.66	Lyon Mountain (1).....	58	4	27.9	.....
Wier's Bridge.....	.....	.....	.....	1.60	McLean.....	.....	.....	.....	2.18
Wolborough.....	.....	.....	.....	1.39	Madison Barracks.....	57	7	35.0	1.42
<i>New Jersey.</i>	.....	.....	.....	.....	Malone.....	61	8	31.6	4.91
Allaire.....	70	15	42.8	.....	Middletown.....	62	16	38.2	1.29
Asbury Park.....	63	18	43.0	0.88	Minnewaska.....	58	11	35.0	.....
Belleville†.....	.....	.....	.....	0.85	Mount Morris.....	67	18	39.0	2.07
Beverly†.....	74	19	42.4	1.07	Newark Valley.....	.....	.....	.....	1.10
Billingsport L. H*.....	66	24	44.3	.....	New Lisbon*.....	60	10	33.4	2.16
Bridgeton*.....	72	24	46.2	0.28	Ogdensburg*.....	62	8	32.6	.....

Meteorological record of voluntary observers, &c.—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean			Max.	Min.	Mean	
<i>Mexico—Cont'd.</i>	0	0	0	Ina.	<i>Newfoundland.</i>	0	0	0	Ina.
Mexico	68	36	52.0	0.26	Saint John's	49	9	27.5	5.81
Puebla	76	34	55.8	T.	Dutch Guiana.				
Topolobampo*	79	67	71.8	0.61	Burnside-Coronic ..	94	69	78.4	7.94
Zacatecas	73	28	49.6	1.44	West Indies.				
New Brunswick.					Hamilton, Ber.	77	53	65.1	4.13
Saint John	47	-11	16.4	6.38	Havana	86	56	73.9	0.90

Received too late for general discussion of weather for December, 1890.

<i>Alabama.</i>					<i>Colorado—Cont'd.</i>				
Selma (3)				3.04	Morgan	65	6	24.7	.....
<i>Arizona.</i>					Pagoda (near)	56	-1	28.0	0.03
Signal 1	71	35	53.9	1.08	Pagosa Springs	48	-15	24.3	1.90
<i>California.</i>					Parachute				0.39
Crescent City L. H.				8.66	Red Cliff				0.46
East Brother L. H.				1.55	Rico				0.80
Farrallon L. H.				1.26	River Bend	66	14	35.7	.....
Humboldt L. H.				5.62	Saint Cloud				0.10
Pt. Año Nuevo L. H.				2.77	Sanborn				0.00
Point Arena L. H.				4.05	Sedgwick				0.05
Point Boneta L. H.				3.59	Sheridan Lake				0.04
Pt. Conception L. H.				2.26	Stamford				1.85
Point Montara L. H.				2.46	T. S. Ranch	53	14	32.5	T.
Point Reyes L. H.				1.37	Thon	71	9	34.4	T.
Presidio of San F.	75	32	50.4	4.75	Upper Pine				T.
Yerba Buena L. H.				0.70	Villas				0.60
<i>Colorado.</i>					Villa Grove				0.19
Abbott				0.00	Waterville				0.40
Agate	63	29	41.0	.....	Watkins	49	17	26.6	.....
Alford				0.13	Westcliffe	57	-7	26.3	0.05
Alma	46	-2	24.2	T.	Wray				T.
Arroyo .....				.....	Yuma				T.
Bennet	87	24	44.4	.....	<i>Massachusetts.</i>				
Box Elder				0.15	Worcester (t)	46	-2	21.1	4.45
Breckenridge	72	-21	25.9	0.85	<i>Michigan.</i>				
Brush				0.05	Berrien Springs (t) ..	50	9	31.1	2.65
Burlington	68	-7	24.6	0.01	<i>Minnesota.</i>				
Byers	62	10	33.0	.....	Blackfoot Agency t.	54	-3	31.8	0.40
Canon City	66	11	42.6	0.03	Horr	49	-5	23.0	1.80
Climax	42	-4	22.0	0.85	<i>Nebraska.</i>				
Como (near)	43	0	22.0	0.02	Kennedy	68	8	32.6	0.53
Cumbres	47	-12	21.2	5.40	<i>New York.</i>				
Deer Trail	66	10	35.0	.....	Amersand	35	-19	10.3	3.93
Delta	50	14	32.2	0.76	Binghamton		-7	22.8	3.15
Dillon				1.38	Constableville				2.72
Eagle Farm				T.	Dunkirk (t)	46	10	28.6	.....
Elkhorn				0.15	Elmira				2.54
Emma				0.26	Factoryville	46	-15	23.3	4.34
First View	66	20	31.0	0.10	Hess Road Station	41	3	24.7	1.60
Greenhorn	63	9	40.0	0.04	Humphrey	48	5	23.9	1.91
Hugo	60	11	33.7	.....	Marshland	46	-7	23.4	2.70
Idaho Springs	58	7	33.7	0.22	Middleburgh	40	-4	19.7	3.15
Julesburg	72	4	34.8	.....	North Hammond	44	-9	14.3	1.75
Kirk				0.00	Number Four	34	-15	11.1	3.32
Kit Carson	70	24	50.0	0.25	South Kortright* ..	43	-13	19.0	5.25
Las Animas	78	8	37.6	.....	<i>Texas.</i>				
Lay				0.36	Menardville	78	22	49.2	2.36
Leadville	53	3	24.1	0.38	Santa Maria				0.17
Le Roy	63	13	31.4	0.01	Venus	76	18	49.8	0.69
Livermore				0.15	<i>Wisconsin.</i>				
Longmont	69	12	37.0	0.15	Beloit	52	-2	26.3	0.55
Minneapolis				0.15	<i>West Indies.</i>				
Monte Vista	46	-6	23.3	0.11	Grand Turk Island ..	85	80	83.9	1.59
Moraine	55	1	33.0	0.35					

Received too late for publication in November, 1890.

<i>Arizona.</i>					<i>Mississippi.</i>				
San Simon	91	35	58.0	0.50	Palo Alto	86	31	59.6	0.03
Wood Canyon				4.00	Summit				0.57
<i>Arkansas.</i>					<i>Missouri.</i>				
Mount Nebo	75	32	54.3	3.27	Columbia	78	23	47.0	.....
<i>California.</i>					Saint Louis	77	23	46.2	1.87
Bishop Creek	82	33	55.0	0.00	<i>Montana.</i>				
Boca	70	8	43.8	0.00	Martinsdale	66	5	38.0	0.80
Felton	90	26	54.7	0.12	<i>Nevada.</i>				
Indio	98	40	68.5	0.00	Reno State Univ'ty.	68	18	36.5	0.00
Jolon				0.57	<i>New Mexico.</i>				
Mered	111?	33	59.7	0.00	Bernalillo				0.60
Monterey (Hotel .....				.....	Monero	64	-3	31.9	1.76
del Monte)	79	37	55.4	0.00	<i>South Carolina.</i>				
Mount Hamilton	77	30	55.5	0.58	Aiken	78	33	59.5	0.50
Mullans	77	32	51.0	.....	<i>South Dakota.</i>				
Santa Rosa	75	33	53.7	0.00	Brookings	68	0	29.4	0.30
Suisun City	89	38	55.9	0.00	<i>Texas.</i>				

Mean temperature (degrees Fahr.) observed at Charleston, S. C., by Drs. Living, Chalmers, Dawson, and Johnson, John Ryan, U. S. Army surgeons (Fort Moultrie), and Signal Service observers.

Year.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
1738...	56.5	54.0	69.0	70.0	74.5	82.0	81.0	78.5	73.5	62.0	54.0	51.5	66.4
1739...	49.0	52.0	62.0	67.0	75.0	77.5	78.5	78.5	69.5	64.0	54.0	56.0	65.2
1740...	46.0	54.5	58.5	69.5	74.0	78.5	81.0	77.5	75.0	59.5	53.0	44.5	64.3
1742...	52.0	48.5	56.5	72.0	74.5	77.5	82.5	81.0	72.5	62.0	49.5	52.5	65.1
1750...	[49.9]	57.0	63.0	65.0	73.0	83.0	75.0	80.0	77.0	67.0	55.0	53.0	66.5
1751...	47.0	54.0	62.0	72.0	76.0	83.0	80.0	78.0	70.5	64.0	60.0	54.0	66.7
1752...	44.0	58.0	64.0	67.0	74.0	79.0	85.0	78.0	72.0	69.0	65.0	53.0	67.3
1753...	53.0	58.0	60.0	65.0	74.0	79.0	78.0	80.0	75.0	69.0	55.0	55.0	66.8
1754...	50.0	57.0	65.0	64.0	77.0	81.0	75.0	81.0	76.0	70.0	56.0	56.0	67.8
1755...	51.0	48.0	57.0	63.0	71.0	78.0	79.0	77.0	74.0	63.0	54.0	49.0	63.6
1759...	55.0	60.0	62.0	63.0	73.0	76.0	84.0	75.0	76.0	66.0	59.0	52.0	67.0
1757...	47.0	52.0	61.0	65.0	72.0	77.0	78.0	79.0	75.0	67.0	61.0	55.0	65.7
1758...	54.0	51.0	51.0	62.0	70.0	79.0	81.0	80.0	73.0	67.0	61.0	43.0	64.3
1759...	44.0	49.0	53.0	63.0	71.0	83.0	86.0	83.0	75.0	65.0	60.0	49.0	65.1
1823...	48.5	43.1	57.1	65.4	75.1	76.0	81.2	79.8	76.4	66.3	56.8	50.9	64.7
1824...	52.9	49.4	60.9	64.6	74.7	79.7	82.8	80.1	75.9	68.4	58.3	54.7	64.9
1825...	50.3	53.8	61.4	62.6	72.9	79.3	82.1	83.6	77.4	70.9	[58.1]	[51.9]	[67.0]
1826...				69.3	73.8	81.1	81.6	81.0	72.2	62.8	54.1	51.9	.....
1827...	44.9	59.9	62.4	69.1	73.7	77.2	83.3	80.7	76.7	[66.7]	[58.1]	[51.9]	[67.0]
1828...	61.5	64.7	64.0	65.1	77.3	86.2	82.7	82.7	78.2	68.6	62.9	59.7	71.1
1829...	51.4	46.4	53.6	63.7	66.2	82.8	84.1	84.3	77.8	[66.7]	[58.1]	[51.9]	[65.6]
1830...	55.8	54.5	63.2	67.3	74.9	79.4	83.2	82.5	81.5	74.2	68.8	56.5	70.2
1831...	45.6	48.4	59.8	68.6	71.8	79.6	80.4	81.4	78.2	71.7	63.3	41.6	65.9
1832...	48.7	57.3	58.9	64.1	72.9	76.9	79.9	80.0	76.0	67.6	59.2	54.4	66.3
1833...	53.2	55.3	57.1	61.3	74.1	77.8	81.3	79.4	77.4	68.1	56.2	50.3	66.1
1834...	49.2	57.9	58.2	63.8	71.3	80.7	82.4	79.7	76.5	68.6	59.4	53.1	66.7
1835...	46.8	40.1	51.7	61.9	73.7	79.7	79.9	80.7	76.5	67.5	64.5	51.5	64.2
1840...	47.7	59.0	60.7	68.7	78.0	78.7	78.7	80.7	78.7	70.3	56.3	46.3	67.0
1841...	54.0	48.7	58.0	61.7	71.7	79.7	82.3	80.7	78.3	62.3	60.7	53.3	67.0
1842...	53.2	53.4	63.3	66.8	71.8	77.0	78.0	71.1	76.2	66.3	53.5	49.3	65.0
1843...	53.7	48.7	48.8	64.7	71.6	78.1	81.5	80.5	68.6	67.3	59.6	53.4	65.7
1844...	47.1	49.7	56.3	65.2	75.9	78.1	81.1	79.0	74.8	65.8	61.7	52.1	65.6
1845...	54.8	53.1	59.2	68.9	72.4	80.7	82.8	80.5	73.2	67.3	57.6	44.6	66.2
1846...	50.6	51.6	58.6	65.9	74.4	79.3	82.8	80.8	78.9	[66.7]	61.5	53.4	[67.9]
1847...	51.4	54.0	54.0	65.4	67.6	78.1	77.6	80.2	74.8	68.1	61.7	50.0	65.2
1848...	50.0	50.2	59.5	65.1	[73.0]	79.5	81.7	82.7	77.1	64.3	50.2	61.7	[66.3]
1849...	49.5	49.0	56.7	64.7	72.6	81.3	78.9	81.2	75.3	67.9	60.9	54.2	66.2
1850...	54.9	50.7	56.2	62.5	71.8	76.8	83.8	83.3	77.8	66.3	59.8	55.6	66.4
1851...	50.8	57.3	60.0	65.5	73.3	78.6	81.9	81.2	73.6	67.3	56.9	48.8	66.3
1852...	43.2	53.0	60.2	62.9	73.8	76.6	81.4	79.8	75.8	70.5	58.5	56.3	66.0
1853...	45.2	53.2	58.2	66.0	70.4	79.4	82.8	80.8	77.1	65.7	60.5	54.2	66.5
1854...	40.8	53.1	62.7	62.8	73.4	78.6	82.1	82.4	78.9	67.9	56.3	47.8	65.6
1855...	51.1	47.0	54.9	65.3	73.0	76.4	81.8	82.1	79.3	64.9	62.6	53.2	66.0
1856...	39.4	47.6	53.0	65.2	72.9	81.5	83.0	81.9	74.6	65.4	59.4	49.1	64.4
1857...	41.7	58.4	53.6	58.2	71.1	79.4	78.3	80.2	76.0	63.3	57.8	57.7	64.0
1858...	35.8	47.9	56.0	65.5	73.0	79.3	81.2	81.4	73.7	70.1	53.1	57.8	66.2
1859...	50.8	55.7	61.6	64.5	71.5	78.0	79.9	78.0	76.2	65.0	60.0	52.9	66.2
1861...	51.3	54.9	57.2	62.8	72.0	78.8	82.4	80.3	[75.8]	68.8	[58.1]	[51.9]	[65.4]
1871...	38.2	54.7	62.5	67.5	72.8	80.5	82.1	79.6	72.6	68.5	58.1	48.6	65.5
1872...	45.2	48.2	52.1	61.7	74.7	79.8	84.9	81.9	77.5	64.8	53.6	45.1	64.4
1873...	47.4	53.3	53.2	64.6	73.0	78.3	81.2	80.3	75.6	63.4	54.4	50.7	64.6
1874...	49.6	50.8	59.9	65.3	71.4	80.9	79.1	78.9	75.6	66.1	58.2	52.2	65.7
1875...	46.8	49.1	57.0	60.8	71.0	78.1	84.6	79.5	74.7	62.8	59.2	53.4	64.8
1876...	55.4	54.2	56.2	64.1	71.4	80.2	83.9	82.5	77.4	62.0	55.6	43.4	65.5
1877...	50.7	50.5	56.2	62.8	68.8	80.4	83.6	81.9	76.8	68.7	58.8	53.5	66.1
1878...	49.7	51.6	61.8	67.0	74.3	78.4	83.1	82.9	77.0	60.9	57.2	48.6	66.5
1879...	49.6	49.3	59.8	63.6	76.3	78.8	83.2	79.5	74.1	70.0	58.5	57.9	66.7
1880...	58.3	56.4	61.7	67.0	73.7	80.6	83.4	81.4	75.8	65.9	53.5	48.6	67.2
1881...	46.8	51.9	54.4	60.4	72.9	81.7	83.4	81.0	80.7	72.0	60.6	55.5	66.8
1882...	55.1	57.3	62.0	66.6	71.6	79.3	81.4	81.7	76.5	69.5	53.4	45.5	67.1
1883...	51.4	57.0	53.8	61.0	70.8	80.3	83.4	79.9	74.3	69.0	59.4	56.0	66.6
1884...	46.6	58.7	59.8	63.3	74.8	75.0	82.2	78.9	77.2	71.2	59.1	53.7	66.7
1885...	50.7	47.5	52.2	63.8	72.7	79.5	81.9	80.6	76.4	65.2	56.6	50.4	65.0
1886...	42.6	47.6	53.9	62.4	72.8	77.3	79.9	78.2	76.1	66.5	57.1	48.4	63.6
1887...	45.6	56.7	54.8	62.6	72.7	77.5	81.7	80.2	74.0	66.0	56.2	51.0	64.9
1888...	51.0	54.0	53.2	65.6	72.3	78.2	78.5	79.7	74.0	64.2	56.3	47.2	64.7
1889...	51.6	47.4	55.0	63.5	73.0	76.8	81.4	78.0	75.8	64.7	60.0	60.0	65.6
1890...	59.3	60.6	56.4	64.8	73.0	82.2	79.8	79.8	76.2	67.6	62.2	51.4	67.8
Mean...	49.9	52.8	58.2	65.0	73.0	79.2	81.4	80.3	75.8	66.7	58.1	51.9	66.0

Table of miscellaneous meteorological data for December, 1890—Signal Service observations—Continued.

Stations and districts.	Elevation above sea-level, feet.	Pressure, in inches.			Temperature of air, in degrees Fahrenheit.						Temperature of the dew-point.		Mean relative humidity, per cent.	Precipitation, in inches.	Departure from normal precipitation.	Total movement, miles.	Wind.			Cloudless days.	Partly cloudy days.	Cloudy days.	Days with rainfall.	Average cloudiness, tenths.		Length of record, years.	Precipitation data since opening of station.					
		Mean actual.	Mean reduced.	Monthly range.	Monthly mean.	Departure from normal.	Maximum.	Mean maximum.	Minimum.	Mean minimum.	Greatest daily range.	Least daily range.					Miles per hour.	Direction.	Date.					Maximum velocity.			8 a. m.	S. p. m.	Greatest for month.	Year.	Least for month.	Year.
Extremes Northwest.																																
Moorhead	935	29.01	30.10	0.97	23.0	+11.8	47	29.6	-18	8.6	36	6	11.0	78.6	0.25	-0.45	8,276	S.	44	NW.	26	16	11	4	3.4	3.1	10	1.74	1887	0.05	1890	
Saint Vincent	804	29.13	30.05	1.13	19.0	+14.0	52	29.6	-27	8.4	36	5	10.8	74.6	0.05	-0.29	6,695	S.	35	NW.	22	8	15	8	4.4	7.4	11	2.40	1889	0.23	1890	
Bismarck	1,681	28.23	30.09	0.87	24.9	+10.9	54	36.6	-7	13.2	41	6	20.3	90.1	0.22	-0.51	7,002	NW.	58	NW.	21	5	5	5	5.3	3.2	17	1.71	1884	0.06	1881	
Fort Buford	1,900	27.96	30.05	0.99	26.0	+14.0	56	36.5	-7	15.4	33	6	14.8	68.1	0.04	-0.64	6,740	NW.	60	NW.	26	11	12	8	3.5	0.4	7	3.08	1880	0.04	1890	
Fort Yates					25.8	+9.8	53	36.8	-9	14.8	34	8			0.70	-0.05		NW.			8	16	7				9	1.98	1883	0.06	1883	
Upper Miss. Valley.																																
Minneapolis					26.4		54	35.8		17.1	32	6			0.18		6,428	NW.				10	13	8	6							
Red Wing	758	29.26	30.13	0.95	24.2		53	31.8	-6	16.7	33	6	15.2	71.6	0.15		6,428	NW.	48	NW.	26	14	7	10	4.3	3.2						
Saint Paul	831	29.16	30.09	0.94	24.0	+6.0	53	32.0	-3	16.0	31	5	15.6	75.0	0.10	-1.77	5,224	SE.	29	NW.	26	9	14	8	6.3	9.3	1	2.69	1880	0.10	1890	
La Crosse	736	29.32	30.15	0.90	26.6	+3.6	52	35.0	-2	18.1	31	6	17.6	76.0	0.38	-0.94	4,227	S.	30	NW.	11	13	8	10	4.4	3.3	19	3.43	1875	0.10	1873	
Davenport	613	29.47	30.16	0.89	30.4	+3.4	57	37.9	6	22.9	33	6	19.4	68.4	0.02	-1.16	7,132	NW.	38	NW.	26	14	6	11	6.4	8.3	1	3.84	1873	0.36	1876	
Des Moines	869	29.19	30.14	1.00	32.3	+7.3	56	42.0	3	22.6	36	7	20.6	71.0	0.11	-1.47	6,407	NW.	36	NW.	13	21	6	4	3.3	4.2	13	2.50	1882	0.11	1890	
Dubuque	651	29.40	30.14	0.88	27.3	+3.3	53	34.5	1	20.1	31	3	20.4	78.6	0.82	-1.10	2,124	NW.	25	NW.	26	10	12	9	6.5	2.3	4	4.08	1884	0.52	1876	
Keokuk	613	29.50	30.18	0.96	33.8	+4.8	57	41.7	13	25.8	32	4	22.6	69.2	0.03	-2.13	4,735	NW.	36	NW.	26	15	8	8	2.4	3.6	20	8.56	1873	0.03	1890	
Osage	359	29.78	30.18	0.81	40.0	+2.0	63	46.7	20	33.3	27	4	29.6	74.0	2.91	-0.62	6,303	SW.	35	N.	12	13	5	13	10.5	1.3	4	8.99	1884	0.73	1876	
Springfield, Ill.	644	29.43	30.14	0.86	34.0	+2.0	60	42.2	14	25.7	30	6	21.6	67.4	0.26	-2.64	7,934	NW.	34	NW.	27	13	11	7	3.4	8.4	5	5.19	1884	0.26	1890	
Saint Louis	571	29.56	30.19	0.89	37.6	+2.6	63	44.3	17	31.0	32	5	27.0	70.4	1.32	-1.15	9,461	SW.	36	NW.	27	11	11	9	7.4	2.3	4	6.18	1884	0.18	1876	
Missouri Valley.																																
Columbia					37.4		65	48.8	7	26.1	42	10	27.2	69.1	0.38		5,945	N.	33	N.	16	10	9	12	3...	4.0	2	0.85	1889			
Kansas City	963	29.12	30.19	1.14	37.4		68	45.7	14	29.1	33	4	24.2	65.6	0.93		6,712	SW.	38	NW.	26	17	6	8	4.3	3.3	3	0.79	1888	0.14	1889	
Springfield, Mo.	1,356	28.70	30.18	0.95	40.0		64	48.3	11	31.7	34	2	28.2	71.9	1.05		7,223	N.	38	NW.	16	13	9	9	5.5	1.3	5	2.52	1888	1.05	1889	
Leavenworth	842	29.27	30.19	1.14	37.0	+6.0	70	46.4	12	27.7	37	4	23.6	67.7	0.40	-1.26	4,432	NW.	29	SW.	13	16	4	11	2.4	6.3	0	5.24	1873	0.08	1889	
Topeka					36.5		71	48.9	6	24.1	39	11			0.91			SW.				15	12	4	3...			1	1.13	1888	0.05	1889
Omaha	1,113	28.96	30.18	0.98	34.6	+9.6	71	44.5	5	24.6	34	5	20.4	65.8	0.08	-0.95	5,351	S.	36	NW.	26	14	11	6	1.3	2.2	21	2.92	1870	0.06	1890	
Ore					34.5		74	47.4	5	21.6	43	9			0.30			NW.				18	7	6	1...			4	0.87	1887	T.	1889
Valentine	2,613	27.34	30.18	0.90	32.2		68	45.3	1	19.2	43	8	19.8	71.2	0.32	+0.06	7,602	SW.	52	NW.	26	12	13	6	2.3	1.2	1	0.84	1889	0.10	1886	
Sioux City	1,158	28.86	30.17	0.92	31.5		68	41.8	-3	21.2	38	4	17.0	65.5	0.10		5,735	NW.	40	NW.	26	15	9	7	3.2	7.3	0	1.14	1889	0.10	1890	
Fort Sully	1,600	28.35	30.12	0.88	28.0		62	38.4	-2	17.5	40	6	17.0	70.8	0.44	-0.05	6,144	NW.	54	NW.	26	10	14	7	5.3	9.3	8	1.18	1883	0.08		
Huron	1,307	28.67	30.13	0.84	24.4	+6.4	54	36.1	-16	12.6	42	7	12.1	67.7	0.68	-0.02	7,402	S.	48	NW.	26	18	10	3	4.2	9.2	10	2.09	1887	0.05	1881	
Yankton	1,232	28.77	30.15	0.88	31.0	+10.0	67	42.9	-7	19.0	45	6	17.6	70.4	0.25	-0.55	6,714	NW.	54	NW.	26	17	12	2	4.2	8.2	5	2.46	1877	0.07	1885	
Northern Slope.																																
Mt. Assiniboine	2,690	27.13	30.02	0.93	29.8	+10.8	56	39.1	-12	20.6	46	4	18.4	67.0	0.25	-0.45	11,874	SW.	72	SW.	21	9	7	15	5.6	2.6	11	1.61	1880	0.08	1881	
Fort Custer	3,040	26.84	30.07	0.76	31.4	+8.4	58	40.9	-7	22.0	34	4	18.9	68.6	0.25	-0.48	5,141	SE.	40	NW.	15	11	8	12	3.4	6.3	9	1.87	1883	0.09	1885	
Helena	4,069	25.86	30.11	0.88	30.2	+6.2	54	36.8	2	23.5	35	4	17.4	65.4	0.87	-0.33	3,738	SW.	60	NW.	25	10	12	9	12.5	9.5	0	4.64	1880	0.18	1889	
Rapid City	3,280	26.64	30.13	0.89	33.6		75	45.3	3	21.8	37	7	16.6	58.0	0.19		5,518	NW.	42	N.	26	10	15	6	6.4	0.3	5	0.51	1888	0.00	1881	
Cheyenne	6,105	24.00	30.09	0.76	36.1	+7.1	61	47.0	13	25.2	41	8	10.5	42.6	0.11	-0.11	9,562	NW.	46	N.	25	18	9	4	2.2	5.4	21	0.80	1883	0.01	1881	
Fort McKinney	5,000	25.02	30.15	0.90	34.8		68	45.6	5	24.1	41	9	22.2	66.2	0.03		5,514	NW.	50	N.	26	14	8	9	2.4	8.4	1	0.29	1888	0.25	1887	
Fort Washakie	5,580	24.49	30.17	0.79	28.7		57	41.8	3	15.6	40	15	14.6	65.8	T.		3,469	SW.	30	SW.	26	17	11	3	0.3	7.3	7	0.62	1889	T.	1890	
North Platte	2,841	27.16	30.20	0.80	34.3	+7.3	70	50.2	4	18.4	50	6	12.7	56.4	0.03	-0.66	6,051	NW.	46	NW.	31	17	10	4	3.2	0.3	0	3.86	1877	0.03	1890	
Middle Slope.																																

Annual summary for 1890—Signal Service stations—Continued.

State and station.	Temperature—degrees Fahrenheit.				Precipitation in inches.		
	Mean annual.	Departure from normal.	Extremes for 1890.				Total 1890.
			Max.	Date of max.	Min.	Date of min.	
<i>Florida—Cont'd.</i>	°	°	°		°		Inches.
Key West.....	76.6	-1.3	89	June 26	48	Mar. 2	42.87
Pensacola.....	69.0	+0.9	97	July 5	25	Mar. 2	47.02
Titusville.....	71.9	.....	95	June 30	32	Mar. 17	53.33
<i>Georgia.</i>							
Atlanta.....	62.8	+1.7	98	June 30	17	Mar. 2	42.60
Augusta.....	66.4	+1.4	102	June 29	23	Mar. 16	42.98
Savannah.....	67.6	+0.5	98	June 26	26	Mar. 16	47.46
<i>Illinois.</i>							
Cairo.....	58.8	+1.1	96	June 30	11	Mar. 1	50.51
Chicago.....	48.8	+0.1	96	Aug. 2	-5	Jan. 22	32.69
Springfield.....	53.0	-0.1	100	July 14	-2	Jan. 22	28.68
<i>Indiana.</i>							
Indianapolis.....	54.0	+1.7	97	June 26	4	Jan. 22	54.87
<i>Indian Territory.</i>							
Fort Sill.....	61.0	+0.4	103	July 21	6	Feb. 28	30.90
<i>Iowa.</i>							
Davenport.....	50.5	+1.2	98	June 26	-8	Mar. 1	25.10
Des Moines.....	49.5	+0.6	101	July 13	-18	Jan. 22	24.74
Dubuque.....	48.5	+1.1	99	Aug. 2	-16	Jan. 22	43.16
Keokuk.....	52.5	+1.0	104	July 14	-6	Mar. 1	26.93
Sioux City.....	48.0	.....	104	July 13	-20	Jan. 16	22.25
<i>Kansas.</i>							
Concordia.....	53.2	+1.7	103	July 17	-14	Jan. 16	17.63
Dodge City.....	54.8	+1.7	104	July 20	-6	Feb. 27	11.72
Leavenworth.....	54.3	+0.8	102	July 14	-6	Jan. 16	28.49
Topeka.....	53.9	.....	102	July 8	-10	Jan. 16	27.97
Wichita.....	56.4	.....	102	July 20	0	Feb. 28	24.07
<i>Kentucky.</i>							
Lexington.....	56.6	.....	94	July 7	6	Mar. 6	61.36
Louisville.....	58.6	+1.3	98	June 27	13	Mar. 6	55.41
<i>Louisiana.</i>							
New Orleans.....	70.4	+1.0	96	July 5	30	Mar. 2	42.17
Shreveport.....	66.9	+0.5	99	July 11	22	Mar. 1	40.54
<i>Maine.</i>							
Eastport.....	41.2	-0.4	82	July 31	-18	Jan. 10	45.02
Portland.....	41.2	-2.4	93	July 31	-4	Dec. 30	51.97
<i>Maryland.</i>							
Baltimore.....	56.6	+1.0	98	July 8	12	Mar. 7	46.96
<i>Massachusetts.</i>							
Boston.....	49.1	+0.3	95	July 31	0	Dec. 3	50.21
Nantucket.....	49.0	+0.1	82	July 28	11	Dec. 20	43.80
Vineyard Haven.....	51.8	.....	92	July 16	10	Mar. 7	42.90
Wood's Holl.....	48.8	-0.2	81	July 16	6	Dec. 13	51.24
<i>Michigan.</i>							
Alpena.....	42.2	+1.5	89	June 28	-13	Mar. 6	31.35
Detroit.....	49.0	0.0	96	July 8	4	Mar. 6	34.99
Escanaba.....	41.8	+2.1	96	June 28	-21	Mar. 6	30.02
Grand Haven.....	46.8	+0.5	90	Aug. 2	4	Mar. 6	32.26
Lansing.....	47.7	+0.5	96	Aug. 3	3	Mar. 6	32.85
Manistee.....	44.7	.....	91	Aug. 2	-7	Mar. 7	35.25
Marquette.....	40.5	+0.7	91	July 28	-12	Mar. 6	34.47
Port Huron.....	46.6	+1.8	95	July 8	2	Mar. 5	32.95
Sault de Ste. Marie.....	38.8	.....	86	July 28	-27	Mar. 6	40.05
<i>Minnesota.</i>							
Duluth.....	39.6	+1.0	92	July 12	-19	Jan. 21	24.09
Moorhead.....	38.8	+1.8	98	July 27	-31	Jan. 21	21.79
Saint Paul.....	43.5	-0.5	94	July 30	-22	Jan. 22	23.38
Saint Vincent.....	35.2	+1.8	.....	.....	.....	.....	22.09
<i>Mississippi.</i>							
Meridian.....	65.4	.....	97	July 7	19	Mar. 2	51.75
University.....	63.5	.....	100	July 12	17	Mar. 2	60.69
Vicksburg.....	67.5	+1.5	99	July 11	24	Mar. 1	52.23
<i>Missouri.</i>							
Columbia.....	55.3	.....	104	July 14	-6	Mar. 1	37.88
Kansas City.....	54.8	+0.9	102	July 13	-5	Jan. 16	31.82
Saint Louis.....	56.8	+0.5	98	July 7	4	Feb. 28	37.69
Springfield.....	56.7	+0.7	96	June 30	-2	Feb. 28	52.57
<i>Montana.</i>							
Fort Assiniboine.....	41.0	+0.7	99	July 25	-40	Feb. 26	9.76
Fort Custer.....	45.2	+0.2	100	July 9	-34	Feb. 26	9.66
Helena.....	43.9	+0.9	96	July 24	-29	Feb. 26	8.80
<i>Nebraska.</i>							
Crete.....	51.1	.....	103	July 30	-18	Jan. 16	21.60

Annual summary for 1890—Signal Service stations—Continued.

State and station.	Temperature—degrees Fahrenheit.				Precipitation in inches.		
	Mean annual.	Departure from normal.	Extremes for 1890.				Total 1890.
			Max.	Date of max.	Min.	Date of min.	
<i>N. Carolina—Cont'd.</i>	°	°	°		°		Inches.
Raleigh.....	61.6	+1.9	97	June 29	20	Mar. 16	43.57
Southport.....	64.6	+1.9	92	June 27	21	Mar. 3	41.08
Wilmington.....	64.8	+1.2	100	June 27	22	Mar. 16	41.33
<i>North Dakota.</i>							
Bismarck.....	40.8	+1.3	103	Aug. 6	-35	Jan. 16	15.75
Fort Buford.....	39.8	0.0	100	July 26	-43	Feb. 26	14.24
Fort Yates.....	43.9	+1.7	101	Aug. 6	-28	Jan. 16	15.71
<i>Ohio.</i>							
Cincinnati.....	56.4	+0.9	96	June 28	6	Mar. 6	47.70
Cleveland.....	50.5	+1.9	97	July 8	7	Mar. 7	47.82
Columbus.....	53.2	+1.0	96	July 8	7	Mar. 6	50.73
Sandusky.....	51.1	+1.1	98	July 8	7	Jan. 22	38.60
Toledo.....	50.7	+1.0	96	Aug. 3	5	Jan. 22	33.64
<i>Oregon.</i>							
Astoria.....	50.8	-0.6	83	Aug. 13	16	Feb. 26	58.49
Baker City.....	45.4	.....	101	July 24	-14	Jan. 6	12.50
Portland.....	52.2	-0.8	96	Aug. 13	10	Feb. 26	40.38
Roseburgh.....	52.9	0.0	95	June 30	15	Feb. 26	34.65
<i>Pennsylvania.</i>							
Erie.....	49.2	+0.3	94	July 8	2	Mar. 7	47.05
Harrisburg.....	52.4	.....	96	July 8	8	Mar. 7	42.63
Philadelphia.....	55.0	+1.0	97	July 8	9	Mar. 7	34.02
Pittsburgh.....	54.1	+0.8	94	Aug. 2	5	Mar. 7	50.61
<i>Rhode Island.</i>							
Block Island.....	49.7	+0.2	85	July 16	10	Dec. 13	31.51
Narragansett Pier.....	49.6	+1.2	90	July 16	3	Mar. 7	55.21
<i>South Carolina.</i>							
Charleston.....	67.8	+1.5	98	June 27	25	Mar. 16	47.84
Columbia.....	64.8	.....	99	June 15, 29	21	Mar. 16	40.69
<i>South Dakota.</i>							
Fort Sully.....	45.8	+1.4	103	July 12	-30	Feb. 28	13.28
Huron.....	43.4	+0.4	103	July 28	-28	Jan. 16	14.68
Rapid City.....	46.9	.....	101	Aug. 6	-27	Feb. 27	14.02
Yankton.....	47.3	+1.1	99	Aug. 7	-22	Jan. 16	21.25
<i>Tennessee.</i>							
Chattanooga.....	62.3	+1.9	95	June 28	15	Mar. 2	52.42
Knoxville.....	60.1	+1.7	95	July 7	15	Mar. 2	49.59
Memphis.....	63.0	+1.4	98	July 1	17	Mar. 1	68.28
Nashville.....	60.9	+1.6	98	June 28	16	Mar. 2	59.97
<i>Texas.</i>							
Abilene.....	64.5	-0.1	99	July 22	12	Feb. 28	28.50
Brownsville.....	74.6	+1.8	97	June 1	31	Mar. 1	25.55
Corpus Christi.....	71.0	-0.8	94	June 1	28	Mar. 1	20.01
El Paso.....	64.7	-0.7	101	June 12	19	Feb. 12	8.49
Galveston.....	71.1	-0.9	92	July 21	30	Mar. 1	47.80
Palestine.....	67.2	+1.6	97	July 21	19	Feb. 28	52.06
Rio Grande City.....	75.7	+1.4	104	July 3, 4	24	Mar. 2	16.47
San Antonio.....	69.5	+1.0	99	July 22	21	Mar. 1	29.77
<i>Utah.</i>							
Salt Lake City.....	51.3	+0.2	100	Aug. 6	-6	Feb. 27	10.33
Taylor's Ranch.....	47.2	.....	100	July 15	-9	Jan. 21	7.56
<i>Vermont.</i>							
Northfield.....	40.4	.....	89	July 8	-22	Dec. 29	38.17
<i>Virginia.</i>							
Cape Henry.....	61.1	.....	99	July 8	22	Mar. 6	45.29
Lynchburg.....	58.8	+1.7	97	July 8	19	Dec. 27	38.22
Norfolk.....	61.1	+1.6	96	July 9	22	Mar. 3	50.22
<i>West Virginia.</i>							
Parkersburg.....	54.5	.....	94	July 8	4	Mar. 7	62.67
<i>Washington.</i>							
Fort Canby.....	49.8	+1.0	85	Aug. 13	17	Feb. 26	53.95
Neah Bay.....	49.1	.....	74	July 1	18	Jan. 2	99.85
Olympia.....	49.5	-0.3	90	Aug. 13	7	Jan. 5	35.88
Spokane Falls.....	47.4	0.0	102	July 24	-23	Feb. 26	16.57
Walla Walla.....	52.8	-0.6	106	July 23	-10	Jan. 6	11.80
<i>Wisconsin.</i>							
Green Bay.....	43.8	+0.7	94	June 28	-23	Mar. 5	36.24
La Crosse.....	45.9	-0.1	96	July 30	-23	Jan. 26	34.77
Milwaukee.....	46.4	+1.3	96	Aug. 2	-10	Jan. 22	30.09
<i>Wyoming.</i>							
Cheyenne.....	46.2	+1.3	92	July 29	-20	Feb. 27	14.47
Fort Washakie.....	43.1	.....	93	July 9	-24	Feb. 27	7.74

Annual summary for 1890—Voluntary stations—Continued.

State and station.	Temperature—degrees Fahrenheit.						Precipitation in inches.	
	Mean annual.	Departure from normal.	Extremes for 1890.				Total for 1890.	Departure from normal.
			Max.	Month.	Min.	Month.		
<i>Massachusetts—Continued.</i>	°	°	°		°		<i>Inches.</i>	<i>Inches.</i>
Medford	47.7		91	July	0	Jan	47.33	
Middleborough	47.4		94	July	0	Feb	51.30	
Milton	46.2		98	July	—10	Dec	47.66	
Monson							48.69	
Mount Nonotuck							50.27	
Myrtle Lake							47.06	
Nahant	48.1		91	July	6	Feb		
New Bedford (1)	47.8		90	July	3	Dec	61.23	
New Bedford (2)	49.1		93	July	2	Mar	59.01	
Newburyport (1)	47.2	+ 0.6	94	July	—2	Feb	50.70	+ 5.65
Newburyport (2)							41.73	
Northampton	48.8		95	July	0	Mar	54.30	
North Billerica	48.4		97	July	0	Dec	48.14	
Robert's Dam							56.90	
Royalston			90	July	0	Mar		
Salem (2)							49.50	
Somerset	51.3	+ 1.8	99	July	0	Mar	55.72	+ 9.91
Springfield Army	48.7		95	July	0	Dec	54.88	
Taunton (1)	49.0		94	July	2	Dec	59.95	
Taunton (2)	49.4		93	July	2	Mar	54.07	
Taunton (3)	48.4		94	July	—4	Mar	54.38	
Wakefield			93	July	—3	Feb	51.37	
Wellesley	49.0		93	July	—4	Mar		
Westborough	48.8		98	July	—2	Dec	47.62	
Winchester							47.04	
Worcester (1)	47.2		94	July	—2	Dec		
<i>Mexico.</i>								
La Laguna			102	July	41	Jan		
Leon de Alderman	54.5		93	May	34	Dec	33.89	
Masatlan			90	Aug.	61	Jan		
Zacatecas	57.7		89	June	23	Feb	26.39	
<i>Michigan.</i>								
Adrian	48.8		102	Aug.	2	Mar	45.06	
Albion (1)	49.1		95	Aug.	2	Mar	41.26	
Allegan							38.37	
Alma	46.4		94	June	—11	Mar	34.32	
Ann Arbor	48.2		93	Aug.	0	Mar	35.35	
Arbela							29.86	
Atlantic			91	July	—10	Mar	27.24	
Ball Mountain	45.1		94	Aug.	—1	Mar	32.80	
Bangor	50.1		104	Aug.	—7	Mar	40.32	
Bell Branch	43.3		91	July	—22	Mar	32.69	
Benton Harbor	52.1		94	Aug.	—2	Jan		
Berlin	49.4		102	Aug.	—8	Mar	44.50	
Berrien Springs (1)	49.4		99	Aug.	—5	Mar	44.50	
Birmingham	48.0		96	Aug.	3	Mar	35.99	
Bronson	46.2		94	Aug.	0	Mar	33.70	
Calumet	38.9		91	July	—8	Mar	27.37	
Cassopolis	49.3		96	Aug.	—3	Mar	40.29	
Caldwell	43.0		94	June	—21	Mar	32.40	
Charlevoix	43.2		92	July	—26	Mar	29.88	
Chelsea			98	Aug.	0	Mar		
Clinton	48.9		101	Aug.	2	Mar	31.89	
Colon	46.2		96	Aug.	0	Mar	39.32	
Concord	47.6		97	Aug.	—1	Mar	32.53	
Crystal Falls	39.0		91	July	—26	Mar	24.26	
Eden	48.2		96	Aug.	—5	Mar	37.63	
Evart			90	June	—27	Mar		
Fitchburg			97	Aug.			42.21	
Flint			99	Aug.	—4	Mar		
Fort Brady			88	July	—34	Mar	33.37	
Fort Mackinac	40.3		81	July	—14	Mar	28.50	
Fort Wayne	48.9		97	July	3	Mar	38.44	
Fremont	45.7		95	June	—13	Mar	29.40	
Grand Rapids	47.7		98	Aug.	—10	Mar	26.60	
Grape	49.6		99	June	0	Mar	30.44	
Grayling	42.9		95	June	—35	Mar	32.51	
Gulliver Lake			90	June	—20	Mar		
Hanover	49.3		96	Aug.	—1	Mar	34.88	
Harrison	43.4		95	June	—14	Mar		
Harrisville	42.1		92	July	—14	Mar	30.87	
Hart	47.6		96	Aug.	—15	Mar	37.23	
Hastings	48.0		94	June	—2	Mar	36.30	
Hayes	46.7		91	June	—7	Mar	26.04	
Highland Station	46.2		95	Aug.	—1	Mar	32.71	
Hillsdale	49.2		96	Aug.	0	Mar	32.95	
Hudson	47.4		98	Aug.	—3	Mar	38.81	
Ionis			99	Aug.	0	Jan		
Ivan	43.5		98	June	—19	Mar	31.43	
Jeddo	47.5		90	July	0	Mar	34.85	
Kalamazoo	49.4	+ 1.8	100	Aug.	0	Mar	35.90	— 2.45
Lathrop	40.7		91	July	—26	Mar	34.14	
Madison	49.1		98	Aug.	—1	Mar	34.39	
Manton	42.9		94	June	—21	Mar	33.22	
Marshall	48.1		99	Aug.	—2	Mar	39.21	
May	46.6		96	Aug.	—6	Mar	31.69	
Montague	45.2		89	June	—11	Mar	30.88	
Mottville	49.1		101	Aug.	—3	Mar	35.96	
Noble							35.85	
North Marshall			97	Aug.	—4	Mar	36.28	
Olivet	46.3		94	Aug.	—5	Mar	32.79	
Otsego	48.3		99	Aug.	—4	Mar	40.97	
Ovid	47.0		98	Aug.	—5	Mar	31.63	
Parkville							66.35	
Paw Paw	49.1		99	Aug.	—10	Mar	34.71	
Pontiac	48.0		99	Aug.	—4	Mar	42.26	
Pulaski	47.5		95	July	3	Mar	31.64	
Roscommon	41.3		93	June	—37	Mar	35.35	
Saint Ignace	40.4		85	July	—23	Mar	37.67	

Annual summary for 1890—Voluntary stations—Continued.

State and station.	Temperature—degrees Fahrenheit.						Precipitation in inches.	
	Mean ann.	Departure from normal.	Extremes for 1890.				Total for 1890.	Departure from normal.
			Max.	Month.	Min.	Month.		
Michigan—Continued.								
Saint John's	47.1	0	97	June	—3	Mar	31.04	
Sand Beach	44.0		93	July	—3	Mar	34.93	
Stanton	45.6		96	Aug.	—10	Mar	36.14	
Stockbridge				Aug.			33.39	
Thornville	48.1	+ 0.7	98	Aug.	—2	Mar	39.76	+ 3.61
Vandalia	48.8		96	Aug.	—2	Mar	40.11	
Vienna							32.45	
Washington	46.9		95	Aug.	0	Mar	37.00	
Weldon Creek	44.9		94	June	—17	Mar	32.96	
West Branch	43.9		92	June	—13	Mar	26.86	
Williamston	49.7		95	Aug.	1	Mar	38.44	
Ypsilanti (1)	45.5		94	Aug.	1	Mar	36.44	
Ypsilanti (2)	47.5		94	Aug.	5	Mar	32.36	
Minnesota.								
Alexandria							22.18	
Crookston	38.3		100	July	—36	Jan	15.87	
Fergus Falls							20.16	
Fort Ripley							24.27	
Fort Snelling	42.7		98	July	—22	Jan	28.86	
L. Winnibigoshish	37.7		94	June	—30	Jan	24.29	
Leech Lake	37.6		94	June	—35	Jan	26.04	
Le Sueur	44.3		97	July	—24	Jan	26.21	
Mankato	45.1		94	July	—16	Jan	23.33	
Minneapolis	48.5	+ 0.8	95	July	—21	Jan	27.07	— 3.41
Montevideo	42.5		94	Aug.	—26	Jan	21.45	
Morris	41.1	+ 0.7	97	Aug.	—27	Jan	18.74	
Northfield	43.2		94	July	—25	Jan	28.99	
Ortonville							17.07	
Pine River	37.6		94	June	—36	Jan	19.68	
Pokagon Falls	38.9		94	June	—40	Mar	26.63	
Red Wing			93	July	—21	Jan		
Redwood Falls							10.77	
Rolling Green	42.6		93	July	—20	Jan	26.61	
Saint Charles	41.3		94	July	—20	Mar	34.41	
Sheldon	43.4				—25	Jan	30.11	
Tracy							16.76	
Mississippi.								
Agricultural College	64.9		96	July	19	Mar	55.05	
Batesville	63.6		98	July	19	Mar	51.23	
Booneville			100	July	14	Mar	51.23	
Brookhaven	67.8		99	July	20	Dec	58.69	
Canton			95	June	23	Mar	48.95	
Columbus (2)	67.4		106	July	18	Mar	54.75	
Edwards	67.4		101	July	21	Mar	54.75	
Fayette			97	July	22	Jan	59.31	
Greenville			98	July	21	Mar	59.31	
Holly Springs	63.4		96	July	18	Mar	71.36	
Kosciusko	64.7		97	July	20	Mar	46.83	
Lake			97	July	16	Mar		
Logtown	69.1		94	June	24	Mar	51.10	
Louisville	65.6		103	July	15	Mar	62.11	
Moss Point	70.1		98	June	25	Mar	55.17	
Palo Alto	64.5		96	July	20	Mar	64.52	
Pearlington	69.5		93	July	30	Mar	50.73	
Port Gibson			95	July	20	Mar		
Pontotoc			99	July	18	Mar		
Riatt			101	June	18	Mar		
Vaiden			104	July	19	Mar		
Washington	68.0		98	July	23	Mar	58.75	
Water Valley	65.7		104	June	19	Mar	58.49	
Waynesborough (1)	66.0		95	July	20	Mar	50.56	
Yazoo City							53.43	
Missouri.								
Boonville							32.75	
Brunswick	53.8		102	July	—4	Feb	37.05	
Conception	51.7		100	July	—19	Jan		
Excelsior Springs	51.3		103	July	—6	Jan		
Fayette	54.5		104	July	—2	Mar	36.64	
Glasgow	54.0		103	July	—3	Jan	29.97	
Grand Pass	53.6		102	July	—3	Jan	31.21	
Harrisonville	51.5		99	July	—1	Feb	39.10	
Hermann							31.31	
Jefferson Barracks	51.1		101	July	—1	Mar	35.32	
Kansas City (1)	55.0		104	July	—6	Jan	36.88	
Kansas City (2)	54.9		104	July	—6	Jan	34.65	
Lebanon	58.4		94	June	2	Feb		
Louisiana Bridge							23.39	
New Haven			103	July	2	Feb		
Oak Ridge	59.0		103	June	7	Mar	51.58	
Oregon	52.4		103	July	—16	Jan	25.34	
Princeton	53.2		106	July	—11	Mar	39.51	
Saint Charles (1)							32.90	
Saint Joseph							32.41	
Sedalia	55.7		102	July	—4	Feb	37.05	
Shelbina							28.10	
Willow Springs	57.8		105	June	2	Feb	54.86	
Wither's Mills			103	July	0	Jan	25.77	
Warrensburg	54.0		105	July	—3	Jan	30.95	
Montana.								
Camp Poplar River	39.7		99	July	—46	Feb	11.20	
Fort Assiniboine	40.9		99	July	—40	Feb	10.37	
Fort Custer	45.2		100	July	—34	Feb	10.09	
Fort Keogh	47.3		105	July	—47	Feb	11.52	
Fort Missoula	43.1		104	July	—18	Jan	13.39	
Fort Shaw	45.0	— 0.2	101	July	—39	Feb	12.31	+ 2.00
Glendive	44.9		105	Aug.	—44	Feb	10.13	
Martinsdale			102	July	—43	Feb		
Powder River	43.7		107	July	—41	Feb	12.39	
Virginia City	45.4		92	July	—27	Jan	9.77	
Nebraska.								
Ansel	49.0		109	July	—26	Feb	19.75	
Anshand	52.0		104	July	—20	Jan	22.22	

Meteorological record of voluntee

Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean	
Mississippi—Cont'd.	°	°	°	<i>Ins.</i>
Logtown.....	79	31	64.5	1.64
Louisville†.....	80	20	55.8	3.75
Macon (1)g.....	80	31	62.8	2.20
Moss Point.....	78	32	63.4	0.62
Okalona†.....	.....	.....	.....	6.10
Palo Alto.....	79	26	54.6	4.59
Pearlington†.....	79	31	64.5	1.64
Port Gibson†.....	82	23	60.0	4.15
Pontotoc.....	76	25	54.1	4.65
Washington.....	81	24	61.2	3.54
Water Valley*.....	79	24	54.5	5.36
Waynesboro (1)†..	78	26	58.2	1.91
Yazoo City†.....	.....	.....	.....	5.54
Missouri.				
Appleton City.....	73	1	34.2	4.85
Brunswick.....	66	3	30.6	2.25
Carthage†.....	73	5	39.1	6.67
Conception.....	56	—19	24.3	3.32
Craig.....	56	—15	24.0	2.43
Excelsior Springs*.	65	—6	27.9	2.21
Fayette†.....	68	—1	33.4	2.96
Frankford (1)*.....	.....	—1	29.2	2.47
Glasgow.....	70	—3	32.3	2.35
Grand Pass.....	68	—3	31.0	2.10
Hannibal.....	52	0	.....	0.85
Harris.....	54	—11	25.9	1.62
Harrisonville†*....	60	1	28.4	2.25
Hermann†.....	.....	.....	.....	6.31
Ironton*.....	76	10	42.9	10.50
Jefferson Barracks.	75	7	39.5	6.30
Jerome.....	.....	.....	.....	5.27
Kansas City.....	67	—6	29.4	2.19
Kidder.....	.....	—12	.....	1.86
Lamont*.....	.....	.....	.....	2.01
Lebanon.....	65	5	40.0	.....
Liberty.....	62	—6	29.0	.....
Louisiana Bridge†.	.....	.....	.....	3.37
Marshfield.....	71	10	42.5	.....
Miami.....	68	—6	31.0	2.39
New Frankfort*....	62	—3	31.0	2.81
New Haven*.....	70	7	37.8	.....
Oak Ridge*.....	76	14	47.4	1.00
Oregon.....	65	—16	22.6	3.53
Osark*.....	70	6	40.0	4.50
Princeton*.....	60	—10	27.8	3.25
Saint Charles (1)...	.....	.....	.....	9.30
Saint Joseph†.....	.....	.....	.....	2.85
Sedalia.....	72	—3	33.3	3.68
Shelbina.....	.....	.....	.....	2.60
Steelville.....	72	8	39.8	7.00
Warrensburg*....	66	—3	30.4	2.57
Warrenton*.....	.....	5	34.0	.....
Willow Springs†..	75	8	42.2	9.55
Wither's Mill*.....	65	2	.....	2.50
Montana.				
Camp Poplar River.	38	—39	—7.5	0.79
Custer.....	.....	.....	.....	0.05
Fort Assiniboine.	45	—38	—4.0	1.05
Fort Custer.....	45	—32	4.5	0.31
Fort Keogh.....	45	—38	0.5	0.28
Fort Logan†.....	48	—40	1.8	0.90
Fort Maginnis.....	56	—31	11.9	0.88
Fort Missoula.....	40	—18	13.2	0.73
Fort Shaw.....	52	—29	10.8	0.30
Galpin†.....	.....	.....	.....	0.36
Glendive†.....	44	—36	—0.3	0.80
Kintyre.....	.....	.....	.....	0.23
Martindale.....	45	—42	7.3	0.28
Powder River†.....	48	—35	3.7	0.50
Virginia City.....	43	—27	12.2	0.87

Meteorological record of voluntary observers, &c.—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean			Max.	Min.	Mean	
Missouri—Cont'd.					Nevada—Cont'd.				
Oregon.....	74	— 2	34.3	1.32	Ruby Hill.....	51	0	28.1	3.70
Ozark*.....	78	0	41.6	3.70	Bodaville.....	70	21	45.0	0.02
Princeton*.....	72	—11	33.6	1.69	Tecoma*.....	60	0	36.4	.....
Saint Charles (1).....	.....	.....	.....	3.70	Tusacora.....	56	10	30.6	3.75
Saint Charles (2)...	70	4	37.7	4.17	Verdi.....	60	15	37.4	2.00
Saint Joseph†.....	.....	.....	.....	0.85	Virginia City.....	58	15	38.6	0.70
Sedalia.....	73	— 2	37.7	1.74	Younts Ranch.....	76	26	53.6	0.20
Shelbina.....	.....	.....	.....	2.70	Newfoundland.				
Steelville.....	71	— 2	39.1	4.50	Saint John's.....	55	9	31.9	5.30
Thayer.....	.....	.....	.....	7.89	New Hampshire.				
Troy.....	.....	.....	32.3	5.30	Antrim.....	.....	.....	.....	5.01
Warrensburg*.....	70	3	36.2	2.03	Belmont.....	.....	.....	.....	5.64
Warrenton*.....	.....	0	35.4	3.40	Berlin Falls.....	54	—19	23.0	.....
Willow Springs†..	79	4	43.5	6.92	Berlin Mills*.....	48	—14	25.7	3.48
Wither's Mill*.....	68	0	.....	3.17	Concord.....	61	— 7	30.2	5.67
Centerville.....	.....	— 8	.....	8.20	East Canterbury...	58	— 5	28.4	5.03
Montana.					Hanover (1).....	50	—11	27.8	3.24
Blackfeet Agency &c.	56	— 4	31.8	0.52	Hanover (2).....	53	—14	27.9	3.41
Camp Poplar River.	52	—22	22.2	0.34	Lake Village.....	.....	.....	.....	5.21
Custer.....	.....	.....	.....	1.58	Manchester (1)....	59	— 4	32.1	6.03
Fort Assiniboine.	52	— 7	27.7	0.11	Mine Falls.....	.....	.....	.....	6.50
Fort Custer.....	65	— 4	35.4	1.18	Nashua*.....	62	— 4	31.1	7.11
Fort Keogh.....	66	— 1	30.6	0.69	Newton.....	60	— 2	31.0	5.61
Fort Logan†.....	58	—10	30.8	0.40	North Conway.....	51	— 6	28.6	2.76
Fort Maginnis.....	52	7	31.8	1.80	North Sutton*.....	.....	0	27.0	3.71
Fort Missoula.....	54	12	34.0	1.13	Pennichuck Station	.....	.....	.....	6.48
Fort Shaw.....	67	12	35.9	0.48	Plymouth.....	49	— 8	27.0	4.41
Galpin†.....	.....	.....	.....	0.02	Stratford.....	46	—20	29.8	3.06
Glendive†.....	69	—15	29.4	0.04	Walpole.....	52	—11	26.1	4.68
Kintyre.....	.....	.....	.....	0.02	West Milan.....	56	—22	20.0	3.90
Martinsdale.....	53	8	31.0	1.77	Wier's Bridge.....	.....	.....	.....	4.90
Powder River†.....	69	—20	33.4	1.09	Wolfborough.....	.....	.....	.....	5.09
Virginia City.....	57	2	32.0	0.51	New Jersey.				
Nebraska.					Allaire.....	76	8	37.8	.....
Ansley†.....	72	0	33.0	1.20	Asbury Park.....	69	9	38.8	7.16