

Deviations from normal temperature—Continued.

State and station.	County.	(1) Normal for the month of Dec.	(2) Length of record.	(3) Mean for Dec., 1890.	(4) Departure from normal.	(5) Extreme monthly mean for Dec.			
						Highest.	Year.	Lowest.	Year.
<i>Oregon.</i>									
Albany	Linn	41.5	11	43.2	+ 1.7	49.5	1886	32.1	1884
Eola	Polk	39.9	19	41.2	+ 1.3	47.0	1886, '87	30.7	1884
<i>Pennsylvania.</i>									
Dyberry	Wayne	25.5	23	20.6	- 4.9	33.3	1889	17.3	1876
Grampian Hills	Clearfield	25.7	26	24.0	- 1.7	37.0	1877	16.0	1876
Wellsborough	Tioga	30.2	17	22.2	- 8.0	39.5	1881	22.2	1890
<i>South Carolina.</i>									
Statesburgh	Sumter	47.7	9	46.8	- 0.9	56.6	1889	43.6	1882
<i>Tennessee.</i>									
Austin	Wilson	40.7	20	41.8	+ 1.1	56.5	1889	25.0	1876
<i>Texas.</i>									
New Ulm	Austin	54.3	17	56.1	+ 1.8	65.8	1889	46.1	1876
<i>Vermont.</i>									
Strafford	Orange	22.1	17	13.4	- 8.7	29.5	1881	13.4	1890
<i>Virginia.</i>									
Birdsnest	Northampton	41.5	22	41.0	- 0.5	51.1	1879	32.7	1876
<i>Washington.</i>									
Fort Townsend	Jefferson	41.0	15	44.8	+ 3.8	45.3	1885	33.0	1884
<i>Wisconsin.</i>									
Madison	Dane	22.7	21	26.3	+ 3.6	38.7	1877	11.7	1876

MAXIMUM AND MINIMUM TEMPERATURES.

The highest temperature reported by a regular station of the Signal Service was 88, at Brownsville, Tex., on the 5th. The maximum temperature rose above 80 over the Florida Peninsula, in south and east-central Texas, and at Los Angeles, Cal., and was above 70 south of a line traced from the Atlantic coast in latitude about 34° westward to the Mississippi River, thence northward to extreme southwest South Dakota, and east of this line continued southward to west Texas. The maximum temperature was also above 70 over south California, extreme south Nevada, and west Arizona. The maximum temperature was lowest in New England north of Massachusetts, generally over New York, the Lake region, and Minnesota, and at stations in the middle and northern plateau regions, where it was below 50. At stations in the middle and west Gulf states and the middle Missouri and Red River of the North valleys the maximum temperature was higher than previously reported for December, the excess above the highest maximum temperature previously reported for December varying from 1 to 4 in east Texas, from 2 to 4 in the middle Missouri valley, and amounting to 8 at Saint Vincent, Minn. The reports of United States Army post surgeons and voluntary observers show the following maximum temperatures in states and territories where temperature rising to or above 80 was reported: Fort Ringgold, Tex., 92; Gila Bend (2), Ariz., 88; Alva, Fla., 86; several stations in Louisiana, 82; Vaiden, Miss., 81; Citronelle, Ala., and Blakely, Ga., 80.

The lowest temperature reported by a regular station of the Signal Service was -27, at Saint Vincent, Minn., on the 2d. The minimum temperature fell below zero in New England from Massachusetts northward, in northeast New York, in the extreme north part of the upper lake region, and north of a line traced from north Wisconsin southwestward to west-central Iowa, and thence northward to northwest Montana. The minimum temperature was highest over extreme south Florida, where it was above 50, and the minimum values were above 40 over south Florida, extreme south Louisiana, along the south Pacific coast, and in extreme south Nevada. The reports of United States Army post surgeons and voluntary observers show the following minimum temperatures in states

and territories where temperature falling to or below zero was reported: Orono, Me., -36; East Berkshire, Vt., -34; Berlin Falls, N. H., -31; Fort Pembina, N. Dak., -29; Pockegama Falls, Minn., -24; Woonsocket, S. Dak., and Breckenridge, Colo., -21; Fort Keogh, Mont., -19; West Bend, Iowa, and Madison Barracks, N. Y., -18; Hillman, Mich., -17; Hayward, Wis., -16; Saratoga, Wyo., -14; Troy, Pa., -13; Monson, Mass., and Fort Niobrara, Nebr., -10; Bonanza, Idaho, -9; Southington, Conn., -5; Garrettsville, Ohio, -4; Lakin, Kans., and Cassville, Mo., -3; Chama and Monero, N. Mex., and several stations in Illinois, -2; Alta, Utah, and Burns, Oregon, zero.

LIMITS OF FREEZING WEATHER.

The southern limit of freezing weather is shown on chart IV by a line traced from the Florida coast south of Jacksonville southwestward to the west Florida coast south of Tampa, and a second line traced just inside the west Gulf coast. The western limit of freezing weather is shown on this chart by a line traced from the lower Gila valley, Arizona, west of north to extreme south Nevada, thence westward to west-central California, thence west of north along the San Joaquin and Sacramento valleys to extreme northwest California, thence along the coast line to the mouth of the Columbia River, and thence northward inside the coast line over west Washington.

RANGES OF TEMPERATURE.

The greatest and least daily ranges of temperature are given in the table of Signal Service data. The greatest monthly ranges of temperature occurred in the middle Missouri and Red River of the North valleys, where they exceeded 70, whence they decreased eastward to less than 40 from the lower lake region southward to east Tennessee and the middle Atlantic coast, and thence increased to more than 60 in north New England. From the middle Missouri valley the monthly ranges decreased southeastward to less than 30 over extreme south Florida, southward to less than 40 on the middle Texas coast, southwestward to less than 40 over south Arizona, and westward to less than 30 on the middle Pacific coast, and to less than 20 in extreme northwest Washington.

FROST.

The first black frost of the season was reported at Shreveport, La., on the 9th, and at New Orleans, La., on the 10th. The first killing frost of the season was reported as follows: 1st, Monticello, Ga.; 4th, Little Rock, Ark.; 8th, Palestine, Tex.; 9th, Pensacola, Fla.; 10th, Savannah, Ga., Duke, Fla., and Red Bluff, Cal.; 28th, Villa City, Fla., and Charleston, S. C.; 29th, Tampa, Eustis, Jacksonville, and Titusville (1 mile from), Fla. Compared with the average date of first killing frost in the several localities the killing frost of the 10th at New Orleans, La., was about 1 week late; that of the 4th at Little Rock, Ark., and of the 29th at Titusville, Fla., was about 2 weeks late; that of the 9th at Pensacola, Fla., and of the 29th at Tampa, Fla., was about 3 weeks late; that of the 10th at Savannah, Ga., and of the 29th at Jacksonville, Fla., was about 4 weeks late; that of the 8th at Palestine, Tex., was about 5 weeks late; and that of the 28th at Charleston, S. C., was about 2 months late. Light frost occurred as far south as Lee county, Fla., on the 10th, 19th, 29th, and 30th; to extreme south Alabama and Mississippi on the 1st, 9th, 10th, 18th, 19th, and 27th to 29th; in east Texas to the 29th parallel on the 8th to 10th, 17th, 18th, and 26th; in southwest New Mexico and southeast Arizona on a number of dates; and in California to Los Angeles on the 6th, 9th, and 31st.

PRECIPITATION (expressed in inches and hundredths).

The distribution of precipitation over the United States and Canada for December, 1890, as determined from the reports of nearly 2,000 stations, is exhibited on chart III. In the table of Signal Service data the total precipitation and the depart-

ure from the normal are given for each Signal Service station. The figures opposite the names of the geographical districts in the columns for precipitation and departure from the normal show, respectively, the averages for the several districts.

The normal for any district may be found by adding the departure to the current mean when the precipitation is below the normal and subtracting when above.

The heaviest precipitation occurred on the north Pacific coast, where 22.09 fell at Neah Bay, Wash. The monthly precipitation exceeded 8.00 in extreme northwest California, and at Cape Breton Island; it exceeded 6.00 along the line of the Central Pacific Railroad crossing the summit of the Sierra Nevada Mountains in California, on the North Carolina, Virginia, Maine, and Nova Scotia coasts; and was more than 4.00 in central Arizona, in an area extending from north Louisiana to west Pennsylvania and central New York, on the north New Jersey and New York coasts, and generally along the New England coast and in south New Hampshire and Vermont. No precipitation was reported at stations in east Colorado and the adjoining part of northwest Kansas. The monthly precipitation was less than 0.25 from Wyoming and Colorado eastward in a narrowing area to west Indiana, from northeast Montana east-southeast over north Minnesota, and from central New Mexico to west Indian Territory, and it was less than 1.00 over a greater part of the Rocky Mountain and plateau regions, in north Texas, the upper Mississippi and Missouri valleys, south Florida, and from the northwest part of the upper lake region to central lower Michigan.

The precipitation was in excess of the December average in the Canadian Maritime Provinces, at southeast New England and southeast New York stations, in Virginia, east Tennessee, and southwest Pennsylvania, over the south part of the southern plateau, and on the extreme north Pacific coast. In all other districts, which include nearly the entire country, the precipitation was deficient. The greatest excess in precipitation occurred on the extreme north Pacific coast, where it amounted to 7.60 at Neah Bay, Wash., and the excess above the normal was more than 4.00 at Cape Breton Island. The greatest deficiency occurred in south Alabama and south Mississippi, where it was more than 3.00, and the deficiency was more than 2.00 on the Atlantic coast south of the 35th parallel, and thence westward over the Gulf States to the 97th meridian, and on the Pacific coast between the 40th and 47th parallels.

Considered by districts the average percentage of the normal in districts where the precipitation was in excess was about as follows: southern plateau, 122 per cent.; middle Atlantic states, 115 per cent.; New England, 103 per cent. In districts where the precipitation was deficient the percentage of the normal was about as follows: middle-eastern slope of the Rocky Mountains, 13 per cent.; lower Rio Grande valley, 15 per cent.; Key West, Fla., 18 per cent.; upper Mississippi valley, 34 per cent.; extreme northwest, 36 per cent.; northern plateau, 39 per cent.; east Gulf states, 41 per cent.; northeast slope of the Rocky Mountains and lower lakes, 43 per cent.; Missouri Valley, 44 per cent.; upper lakes, 51 per cent.; west Gulf states, 52 per cent.; south Atlantic states, 55 per cent.; middle plateau, 67 per cent.; middle Pacific coast, 71 per cent.; south Pacific coast, 70 per cent.; southeast slope of Rocky Mountains, 81 per cent.; Ohio Valley and Tennessee, 89 per cent.; and north Pacific coast, 97 per cent.

For the year 1890 the precipitation averaged nearly the normal in New England, the middle Atlantic states, at Key West, Fla., in the west Gulf states, the extreme northwest, on the southeast slope of the Rocky Mountains, over the southern plateau, and on the middle Pacific coast. It averaged one-tenth to two-tenths in excess of the normal in the Ohio Valley and Tennessee and the lower lake region. It averaged two-thirds to three-fourths of the normal in all other districts, save in the upper lake region, the upper Mississippi and Missouri valleys, and on the north Pacific coast, where eight-tenths to nine-tenths of the normal amount was reported.

The heaviest precipitation ever reported for December was noted at Pittsburgh, Pa., in 1890, when the excess above the normal was 2.89, and the precipitation was 0.64 greater than previously reported for December. The heaviest precipitation for December occurred from the middle Missouri valley south-

ward over the middle slope of the Rocky Mountains to the Rio Grande Valley, and on the North Carolina coast in 1877, when the excess was 2.00 to 5.00 from the middle Missouri valley to the Rio Grande Valley, and 3.00 to 7.00 on the North Carolina coast; over north New York and middle and east-central New England in 1878, when the excess was 3.00 to 7.00; from the middle Ohio valley southward over east Kentucky, east Tennessee, and north Georgia in 1879, when the excess was 2.00 to 5.00; in the upper Missouri and Sacramento valleys in 1880, when the excess was 1.00 to 3.00 in north Montana, and 7.00 to 8.00 in the Sacramento Valley; in Alabama in 1881, when the excess was 4.00 to 5.00; from south Montana and west North Dakota southward over Wyoming and central Colorado in 1883, when the excess was 0.50 to 1.50; from east Texas and north Louisiana northeastward over the middle Mississippi and lower Ohio valleys and Michigan, over the southeast part of the southern plateau region, and in southeast New York, north New Jersey, and Connecticut in 1884, when the excess was 3.00 to 12.00 in Louisiana and Arkansas, 2.00 to 5.00 in the middle Mississippi and lower Ohio valleys, 3.00 to 6.00 in Michigan, about 3.00 in southeast New York and Connecticut, and 1.50 to 3.00 in east Arizona; on the coast of Washington in 1886, when the excess was 6.00 to 14.00; on the South Carolina coast in 1887, when the excess was about 4.00; generally over the plateau region and on the south Pacific coast in 1889, when the excess was 1.00 to 3.00 over the plateau region, and 5.00 to 12.00 on the south Pacific coast.

The least precipitation ever reported for December occurred in north North Dakota, Minnesota, west and south Iowa, and south Nebraska, at Walla Walla, Wash., and at stations in Indiana, Louisiana, and Michigan in 1890, when the deficiency below the normal was 0.30 to 0.75 in north North Dakota and northwest Minnesota, over 1.00 in southeast Minnesota, about 1.00 in Iowa and south Nebraska, and about 2.00 at Walla Walla, Wash.; at Lake Michigan stations in 1872, when the deficiency was about 2.00; in the lower lake region and at Lake Huron stations in 1874, when the deficiency was about 2.00; in south New England, southeast New York, New Jersey, and east Pennsylvania in 1877, when the deficiency was about 2.00; in the Ohio Valley, north Tennessee, and at stations in the middle Mississippi valley in 1876, when the deficiency was 1.50 to 3.50; in the Sacramento Valley in 1883, when the deficiency was 3.00 to 4.00; at stations in the southern plateau region and in extreme south California in 1886, when the deficiency was about 2.00 at San Diego, Cal., and Fort Apache, Ariz., and 0.42 at Keeler, Cal.; and from the southern plateau region eastward over the Gulf States and in the Atlantic coast states south of the 40th parallel in 1889, when the deficiency was 3.00 to 4.00 in the Atlantic coast and east and west Gulf states, and 1.00 to 2.00 in the lower Rio Grande valley.

In 1877, when the precipitation was the heaviest ever reported for December on the North Carolina coast and from the middle Missouri valley south to the Rio Grande valley, it was the least ever noted for that month in south New England, southeast New York, New Jersey, and east Pennsylvania. In 1883, when it was the heaviest on record from Montana southward over central Colorado, it was the least ever noted in the Sacramento Valley. In 1886, when it was the heaviest on the coast of Washington, it was the least over the southern plateau and extreme south California. In 1889, when it was the heaviest ever reported generally over the plateau region and on the south Pacific coast, it was the least recorded for that month over the southeastern part of the country. In 1890, when the precipitation was the heaviest ever reported for December in west Pennsylvania, it was the least noted for that month from the Red River of the North Valley southward over Iowa, and thence westward over south Nebraska.

#### DEVIATIONS FROM AVERAGE PRECIPITATION.

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

State and station.	County.	(1) Average for the month of Dec.	(2) Length of record.	(3) Total for Dec., 1890.	(4) Departure from average.	(5) Extremes for Dec.			
						Greatest.		Least.	
						Am't.	Year.	Am't.	Year.
<i>Arkansas.</i> Lead Hill.....	Boone.....	3.62	9	2.15	-1.47	11.37	1884	1.15	1889
<i>California.</i> Sacramento.....	Sacramento	4.70	40	3.72	-0.98	13.41	1852	0.00	50,'76
<i>Connecticut.</i> Middletown.....	Middlesex...	3.75	30	4.46	+0.71	7.91	1878	1.20	1875
<i>Florida.</i> Merritt's Island.....	Brevard.....	2.47	12	3.15	+0.68	8.55	1888	0.00	1889
<i>Georgia.</i> Forsyth.....	Monroe.....	4.51	16	2.88	-1.63	7.56	1887	0.79	1889
<i>Illinois.</i> Peoria.....	Peoria.....	2.44	35	0.41	-2.03	7.15	1873	0.28	1876
<i>Indiana.</i> Riley.....	McHenry.....	2.05	39	1.13	-0.92	5.67	1876	0.28	1857
<i>Iowa.</i> Logansport.....	Cass.....	3.37	14	0.46	-2.91	5.99	1881	0.46	1890
<i>Kansas.</i> Vevay.....	Switzerland..	3.87	25	3.03	-0.84	7.60	1879	1.16	1888
<i>Maryland.</i> Cresco.....	Howard.....	1.37	19	0.44	-0.93	2.83	1879	0.30	1874
<i>Massachusetts.</i> Monticello.....	Jones.....	2.40	35	0.71	-1.69	6.99	1856	0.65	1867
<i>Michigan.</i> Logan.....	Harrison.....	1.37	20	.....	.....	3.10	1868	0.14	1889
<i>Minnesota.</i> Lawrence.....	Douglas.....	1.65	26	1.00	-0.65	4.39	1873	0.08	1889
<i>Mississippi.</i> Wellington.....	Sumner.....	0.98	11	0.79	-0.19	3.14	1884	T.	1889
<i>Missouri.</i> Grand Coteau.....	St. Landry...	5.82	7	2.27	-3.55	14.43	1884	2.27	1890
<i>Maine.</i> Orono.....	Penobscot....	3.94	20	4.10	+0.16	7.92	1878	1.50	1875
<i>Maryland.</i> Cumberland.....	Alleghany....	2.11	19	3.77	+1.66	4.50	1881	0.70	1870
<i>Massachusetts.</i> Amherst.....	Hampshire...	3.56	55	3.15	-0.41	7.09	1839	0.96	1838
<i>Michigan.</i> Newburyport.....	Essex.....	3.86	12	5.51	+1.65	5.80	1886	2.45	1880
<i>Minnesota.</i> Somerset.....	Bristol.....	3.44	18	4.17	+0.73	5.67	1884	0.82	1875
<i>Michigan.</i> Kalamazoo.....	Kalamazoo...	3.01	14	1.35	-1.66	7.14	1884	1.35	1890
<i>Minnesota.</i> Thornville.....	Lapeer.....	2.53	13	1.43	-1.10	5.25	1879	0.67	1880
<i>Minnesota.</i> Minneapolis.....	Hennepin....	1.57	23	0.50	-1.07	5.30	1873	0.33	1866
<i>Montana.</i> Fort Shaw.....	Lewis & Clarke	0.52	20	0.47	-0.05	2.47	1884	0.00	75,'77
<i>New Hampshire.</i> Hanover.....	Grafton.....	2.52	48	4.66	+2.14	5.05	1839	0.78	1875
<i>New Jersey.</i> Moorestown.....	Burlington...	3.13	27	2.99	-0.14	5.77	1865	0.90	1877
<i>New York.</i> South Orange.....	Bristol.....	3.82	20	4.08	+0.26	7.07	1878	0.91	1877
<i>New York.</i> Cooperstown.....	Otsego.....	2.58	36	4.33	+1.75	6.02	1881	0.97	1877
<i>New York.</i> Palermo.....	Oswego.....	3.84	36	3.48	-0.36	7.95	1878	1.60	1874
<i>North Carolina.</i> Lenoir.....	Caldwell.....	3.78	16	2.50	-1.28	8.70	1877	0.50	1889
<i>Ohio.</i> N. Lewisburgh..	Champaign...	2.94	18	1.85	-1.09	5.45	1873	1.50	1882
<i>Ohio.</i> Wauseon.....	Fulton.....	2.39	18	1.16	-1.23	4.32	1879	0.41	1874
<i>Oregon.</i> Albany.....	Linn.....	8.62	11	4.92	-3.70	14.21	1887	4.30	1888
<i>Oregon.</i> Eola.....	Polk.....	5.80	21	4.33	-1.47	11.50	1880	0.84	1876
<i>Pennsylvania.</i> Dyberry.....	Wayne.....	2.64	24	5.29	-2.65	5.29	1890	1.20	1874
<i>Pennsylvania.</i> Grampian Hills..	Clearfield....	3.69	20	4.15	-0.46	5.12	1872	1.99	1871
<i>Pennsylvania.</i> Wellsborough...	Tioga.....	4.72	11	4.97	-0.25	9.57	1881	1.27	1883
<i>South Carolina.</i> Statesburgh.....	Sumter.....	3.17	9	1.81	-1.36	5.87	1884	0.75	1889
<i>Tennessee.</i> Austin.....	Wilson.....	4.29	20	3.03	-1.26	10.20	1875	0.85	1882
<i>Texas.</i> New Uim.....	Austin.....	4.36	17	1.27	-3.09	16.43	1875	0.37	1889
<i>Vermont.</i> Strafford.....	Orange.....	3.26	17	3.30	+0.04	5.90	1878	0.15	1875
<i>Virginia.</i> Birdsneat.....	Northampton	3.63	21	6.30	+2.67	6.75	1880	0.55	1889
<i>Washington.</i> Fort Townsend..	Jefferson.....	2.58	16	3.30	+0.72	5.10	1886	1.14	1879
<i>Wisconsin.</i> Madison.....	Dane.....	2.05	18	0.62	-1.43	5.73	1884	0.45	1874

**O EXCESSIVE PRECIPITATION.**

Precipitation to equal or exceed 10.00 was reported at 3 stations in Washington, the greatest amount, 22.09, being noted at Neah Bay.

In December of preceding years monthly precipitation to equal or exceed 10.00 has been reported for 26 years in Oregon; for 24 years in Cal.; for 15 years in Wash.; for 11 years in Miss.; for 8 years in Tex. and La.; for 6 years in Fla. and N. C.; for 4 years in Ala., Ark., and Ga.; for 3 years in Mass. and N. Y.; for 2 years in Ind., Ky., Mo., N. H., Ohio, and Tenn.; and for 1 year in Ariz., Mich., Nev., N. J., and

Va. In states and territories other than those named precipitation to equal or exceed 10.00 has not been reported for December. Among the heavier rainfalls reported for December are: in California, 20.60, at Fort Miller, in 1852; 28.65, at Fort Gaston, in 1864; 20.55, at Fort Gaston, in 1866; 22.19, at Fort Gaston, 1867; 24.67, at Camp Wright, in 1866; 29.03, at Camp Wright, 1867; 30.35, at Meadow Valley, in 1866; 41.95, at Nevada City, in 1867; 23.76, at Shingle Springs, in 1867; 28.39, at Cisco, in 1871; 20.42, at Healdsburg, in 1871; 41.87, at Pilarcitos, in 1871; 51.05, at San Andreas, in 1871; 28.88, at Summit, in 1871; 28.91, at Mount Saint Helena, in 1880; 24.34, at Mumford Hill, in 1880; 32.07, at Reed's Camp, in 1880; 21.85, at Vacaville, in 1880; 31.20, at Emigrant Gap, in 1884; 25.05, at Cisco, in 1884; 23.60, at Colfax, in 1884; 33.84, at Mount Hamilton, in 1884; 20.96, at San Rafael, in 1884; 26.26, at Crescent City, in 1885; 22.69, at Grass Valley, in 1888; and 29.36, at Upper Mattole, in 1889. Precipitation to exceed 20.00 in December has been reported for 8 years in Oregon; for 5 years in Wash.; and for 1 year in Tex. and La. Exclusive of the instances and years cited precipitation to equal or exceed 15.00 in December has been reported for 9 years in Oregon; for 7 years in Wash.; for 6 years in Cal.; for 2 years in Tex.; and for 1 year in Ala., Ark., Fla., La., N. H., N. Y., and N. C.

Precipitation to equal or exceed 2.50 in 24 hours was reported at 5 stations in La., and on 4 dates, the 5th to 7th and 25th; at 5 stations in Miss., on the 6th; at 4 stations in Cal., and on 3 dates, the 2d to 4th; at 2 stations in N. Y., and on 2 dates, the 17th and 18th; at 2 stations in Va., and on 4 dates, the 16-17th and 25-26th; at 2 stations in Wash., and on 2 dates, the 20th-21st; at 2 stations in Tenn., and on 2 dates, the 6th and 25th; at 1 station in Ark., on the 6th; at 1 station in Fla., on the 14th; at 1 station in Me., on the 27th; and at 1 station in Pa., on the 17-18th. Among the heavier rainfalls reported for this period are: 6.15, at Farmerville, La., 5th; 4.89, at Washington, Miss., 6th; and 4.00, at Arkansas City, Ark., 6th.

In December of preceding years precipitation to equal or exceed 2.50 in 24 hours has been reported for 13 years in Cal.; for 12 years in Tex.; for 11 years in Ga. and N. C.; for 10 years in Fla. and La.; for 9 years in Ala. and Oregon; for 8 years in Miss. and Tenn.; for 7 years in Ill., Ind., and Va.; for 6 years in Ohio, Pa., S. C., and Wash.; for 5 years in Kans. and Md.; for 4 years in Ky., Mass., Mo., and N. Y.; for 3 years in Ark., Del., N. J., and Mich.; for 2 years in Ariz., Iowa, Me., and N. H.; and for 1 year in Conn., Ind. T., Utah, and Vt. In states and territories other than those named precipitation to equal or exceed 2.50 in 24 hours has not been reported for December of preceding years. Among the heavier rainfalls reported for this period in December of preceding years are: 13.50, at Point Pleasant, La., 19th, 1882; 6.60, at Fort Gaston, Cal., 24-25th, 1883; 6.65, on the 2-3d, and 9.04, on the 23d-24th, at Mount Saint Helena, Cal., in 1880; 12.15, at Monroe, La., 29-30th, 1884; 6.00, at Fayetteville, N. C., 9-10th and 20th-21st, 1878; 6.33, at Micco, Fla., 24th, 1888; 8.47, Yaquina Light-house, Oregon, 5-6th, 1887; at Clarksville, Tex., 8.50, 29-30th, 1874, and 8.50, 28-29th, 1876; 6.74, at Lynchburgh, Va., 21st, 1884. Exclusive of the instances and years cited precipitation to equal or exceed 5.00 for the period named has been reported for 2 years in Fla., and for 1 year in Ala., Cal., Ill., La., Mo., N. Y., N. C., and Tex.

Precipitation to equal or exceed 1.00 in 1 hour was reported at 3 stations in La., and on 3 dates, the 5th, 7th, and 25th; at 1 station in Ga., on the 8th; and at 1 station in Tex., on the 24th. Remarkably heavy rainfall in one hour was not reported for December, 1890, and excessive rainfall for 5 and 10 minute periods is given in the table of "Maximum rainfall in one hour or less."

In December of preceding years precipitation to equal or exceed 1.00 in 1 hour has been reported for 5 years in Tex.; for 3 years in Cal.; for 2 years in Fla., Ind., Ill., Pa., and Tenn.; and for 1 year in Ala., Ark., Kans., La., Mass., Mich., and

Miss. In states and territories other than those named precipitation to equal or exceed 1.00 has not been reported for December of preceding years. Among the heavier rainfalls reported for 1 hour or less in December of preceding years are: 1.20, in 20 minutes, at Wellsborough, Pa., 7th, 1884; 1.36, in 20 minutes, at Clarksville, Tex., and 1.36, in 20 minutes, at Galveston, Tex., 28th, 1871; and 1.00, in 20 minutes, at Winnebago, Ill., 21st, 1889.

Table of excessive precipitation, December, 1890.

State and station.	Monthly rainfall to inches, or more.	Rainfall 2.50 inches, or more, in 24 hours.		Rainfall of 1 inch or more, in one hour.		
		Amt.	Day.	Amt.	Time.	Day.
Arkansas City.....	Inches.	Inches.		Inches	h. m.	
Arkansas.....		4.00	6			
California.....						
Fort Gaston.....		3.45	3.4			
Grass Valley.....		2.60	3			
Iowa Hill.....		2.61	4			
Los Gatos (2).....		2.70	2.3			
Florida.....						
Merritt's Island.....		2.82	14			
Georgia.....						
Savannah.....				1.20	1 00	8
Louisiana.....						
Amité City.....		4.76	7			
Farmerville.....		6.15	5			
Grand Cane.....		3.50	5.6			
Homer.....		3.00	5	3.00	1 00	5
Juling.....		2.69	25			
New Orleans.....				1.25	1 00	25
Sugar Experiment Station.....				1.60	1 00	7
Maine.....						
Bar Harbor.....		2.65	27			
Mississippi.....						
Fayette.....		3.39	6			
Greenville.....		2.55	6			
Kosciusko.....		4.00	6			
Washington.....		4.89	6			
Pontotoc.....		2.55	5.6			
New York.....						
Pine City.....		3.50	18			
Betauket.....		3.20	17			
Pennsylvania.....						
Wellsborough.....		2.75	17, 18			
Tennessee.....						
Andersonville.....		2.50	25			
Savannah.....		2.85	6			
Texas.....						
Galveston.....				1.30	1 00	24
Virginia.....						
Lynchburgh.....		3.13	16, 17			
Norfolk.....		2.50	25, 26			
Washington.....						
Lapush.....		11.24				
Neah Bay.....		22.09				
Olympia.....		3.01	20, 21			
Tatoosh Island.....		2.75	20, 21			
		19.57				

**SNOW** (in inches and tenths).

Chart V shows the depth of snowfall reported for the month. The greatest depth of snowfall reported was 86.0, at Blue Knob, Pa. The snowfall exceeded 70.0 along the line of the Central Pacific Railroad crossing the summit of the Sierra Nevada Mountains in California. It exceeded 60.0 in southwest and northeast Pennsylvania; 50.0 in central New York, and at Cumbres, Colo.; 40.0 in south-central and southwest Maine, north New Hampshire, north-central Virginia, and southeast Ohio; 30.0 in west-central lower Idaho, north-central New Mexico, generally in Vermont, and in north West Virginia; 20.0 in northeast Massachusetts, west Maryland, north lower and upper Michigan, west-central Nevada, east Ohio, and north-central Utah; and 10.0 in the mountains of southeast Arizona, and central Colo., northeast Oregon, central and southwest Montana, north-central South Dakota, northeast Wisconsin, north-central Iowa, east-central Missouri, southeast Kansas, north-central Kentucky, south-central Illinois, south Indiana, south and north New Jersey, east Maryland, District of Columbia, and west North Carolina. No snowfall was reported south of a line traced from the central North Carolina coast south of west to central Georgia, thence northwestward to extreme southeast Missouri, and thence irregularly south of west to southwest New Mexico. The western limit of snow is shown by a line traced from south-central Arizona northwestward to south Nevada, thence to central

California in about latitude N. 36°, thence west of north over the east valleys of the San Joaquin and Sacramento rivers to northwest California, and thence east of north over Oregon and Washington.

Snowfall of 10.0, or more, was reported as follows, and in states and territories where the maximum depth was below that amount, the station reporting the greatest is given: *Alabama*.—Mountain Home, trace. *Arizona*.—Chiri Cahua Mountains, 14. *Arkansas*.—Lead Hill, 6.5. *California*.—Summit, 74; Cisco, 65; Emigrant Gap, 44; Boca, 34.5; Truckee, 33; Susanville, 15.5. *Colorado*.—Cumbres, 54; Pagosa Springs, 19; Stamford, 18.5; Dillon, 13.8. *Connecticut*.—New Hartford (1), 18.5; New Hartford (2), 18; Canton, 15; West Simsbury, 13; Falls Village, 12; Hartford (1), 10.8. *Delaware*.—Dover, 8. *District of Columbia*.—Washington City, 13. *Georgia*.—Diamond, 3.8. *Idaho*.—Placerville, 36. *Illinois*.—Louisville, 20; Centralia, 15; Olney (1), 13.2; Pana, 13; Greenville, 12.2; Grand Tower, Palestine, and Rockford, 12; Jordan's Grove, 11.5; Martinsville and Mascoutah, 11; McLeansborough and Winnebago, 10. *Indiana*.—Princeton, 15.5; Seymour and Worthington, 14.5; Vevay, 13.4; Cannelton and Columbus, 13; Butlerville, 12.2; Mauzy, 12; Franklin, 11.5; Indianapolis, 11.4; De Gonia Springs, 11; Muncie, 10. *Iowa*.—Hampton, 11.2. *Kansas*.—Oswego, 10. *Kentucky*.—Shelbyville, 10. *Maine*.—Lewiston, 46; Farmington, 44.5; Cornish, 36.5; Kent's Hill, 36; Orono, 28.5; Fairfield, 28; Belfast, 27; Calais, 22; Bar Harbor, 18; Fort Preble, 15; Portland, 14. *Maryland*.—Cumberland (1), 26; Mount Saint Mary's, 15; Cumberland (2), 14.5; Baltimore, 10.6; Woodstock, 10.3. *Massachusetts*.—Concord, 21.6; Andover, Groton (1), and Lawrence, 20; North Billerica, 19; Fitchburgh (2), Gilbertville, and Newburyport (1), 18; Amherst Experimental Station (2), Mount Noubtuck, Salem (2), Wakefield, and Westborough, 16; Amherst Experimental Station (1), 15.5; Royalston, 14.6; Kendall Green and Leominster, 14; Springfield Armory, 13; Leicester and Ludlow (1), 12; Dudley, 11.4; Fall River (1), Mansfield, and Monson, 11; Amherst, Framingham, Somers, and Taunton (2), 10. *Michigan*.—Charlevoix, 29.5; Marquette, 28.7; Sault de Ste. Marie and Sand Beach, 26; Harrisville, 25.2; Fort Brady, 24.8; Northport, 22.4; Atlantic, 21; Roscommon, 20; Bangor, 19.7; Alpena, 18.1; Parkville, 17.7; Grayling, 17.5; Otsego, 17; Kalamazoo, 16.5; Grape, 16.3; Ypsilanti (1), 16.2; Ivan, 16.1; Bronson, 16; Allegan and Weldon Creek, 15.5; Cassopolis, 15; Gulliver Lake, 14.8; Noble, 14.7; Fitchburgh, Fort Wayne, and Pontiac, 14.5; Ionia, 14.4; Paw Paw, 14.2; Cheboygan, 14; Albion (1), 13.6; Eden, Rawsonville, and Thornville, 13.5; Colon, 13.4; Ann Arbor, 13.3; Ball Mountain, 13.1; Caldwell, Harbor Springs, and Manton, 13; Mottville and Port Huron, 12.8; Marshall, Olivet, and Saint Ignace, 12.5; Fairview, 12.4; Stockbridge, 12.1; Calumet and Ypsilanti (2), 12; Highland Station, 11.6; Howell and Stanton, 11.5; Hanover, 11.4; Madison, 11.3; Birmingham, 11.2; Vandalia, 11.1; Benton Harbor and Lathrop, 11; Grand Haven, 10.8; Hastings, 10.6; Fremont, Pulaski, Saint John's, and Washington, 10.5; Berlin, 10.2; Adrian, Alma, Clinton, May, and Williamstown, 10. *Minnesota*.—Sheldon, 5.9. *Missouri*.—Hermann and Saint Louis, 11; Springfield and Steelville, 10. *Montana*.—Virginia City, 18; Martinsdale, 16; Helena, 12; Choteau, 11; Powder River, 10. *Nebraska*.—Hay Springs, 3.5. *Nevada*.—Virginia City, 24.5; Lewer's Ranch, 16; Belmont, 15.8; Verdi, 12.5; Austin, 11; Carson City, 10.1; Ely, 10. *New Hampshire*.—North Conway, 45; Berlin Mills, 41.5; Hanover (1) and West Milan, 36; Hanover (2), 32.5; Walpole, 32; North Sutton, 31; Plymouth, 29; Stratford, 28; Antrim and Concord, 27; Littleton, 26; East Canterbury, 23.5; Manchester, 23.1; Newton, 23; Manchester (1), 20; Nashua, 19.2. *New Jersey*.—Cape May, 13.5; Newton, 12; Belleville, 11.5; Asbury Park, 11; Gillette, Ocean City, and Oceanic, 10. *New Mexico*.—Chama, 31; Fort Marcy, 21; Cuba, 19; Monero, 14.6; Coolidge, 14; Embudo, 13; Santa Fé, 11.9. *New York*.—Turin, 65; Utica, 59; Brookfield, 57.5; Pine City, 56.9; Le Roy, 52.2; Apulia, 46; Lyon Mountain, 42.9; Addison, 42.3; South Canisteo, 40.4;

Wedgwood, 38; Perry City, 37.8; Quaker Street, 37; Newark Valley, 36; Lyons, 35.8; Alabama, Cooperstown, and Scho-dack Depot, 34; Oxford, 33.5; Ithaca, 32.3; Rochester, 29.2; New Lisbon, 28.8; Adams Centre and Baldwinsville, 27.5; Oswego, 26.4; Easton, 26.2; Keene Valley, Galway, and Watervliet Arsenal, 26; Albany, 25.9; Demster, 25.5; Chenango Forks, 25; Ogdensburgh and Plattsburgh Barracks, 24.5; Buffalo, 24.4; Plattsburgh and Sand Bank, 24; Palermo, 23.8; Deposit, 22.5; Hammondsport, 22; Wappinger's Falls, 21.5; Geneva, 20.8; Akron, 20.2; Rondout, 19.5; New York City, 19.1; Sherman, 19; Fleming and Lowville, 18; Madison Barracks, 17; Malone and Palmyra, 16.5; Romulus, 16.2; Pendleton Centre, 16; Middletown, 15.5; De Kalb Junction, 14.2; Canton, 13.9; Honeynead Brook, 13.4; Arcade (1), 13.1; Ardenia, Port Jervis, and Willetts Point, 13; Fort Schuyler, 12.5; Potsdam and White Plains, 12; Central Park (New York City), 11.4; Boyd's Corners, 10.8; Liberty, 10. *North Carolina*.—Murphy, 14.5; Mt. Airy, 11.5. *North Dakota*.—New England City, 5. *Ohio*.—New Alexandria, 41.5; Demos, 27; Garrettsville, 25; McConnellsville, 22; Youngstown, 21.7; Vienna, 19; Gratiot, 18.7; Hiram, 18.4; Orangeville, 18; Akron, 17.5; Ellsworth and Lordstown, 17; Jacksonborough, 16; Logan, 15.3; Oberlin, 15.2; Weymouth, 14.5; New Comerstown, 14; Columbus, 13.5; Canton and Marietta (2), 12.5; Ashland, 12; Columbus Barracks and Hassan, 11.5; Athens, 11; Georgetown, 10.6; Waynesville, 10.5; Pomeroy and Toledo, 10.4; Waverly, 10.2; Marietta (1), Springborough, Wauseon, and Wheeler, 10. *Oklahoma Territory*.—Fort Reno, 1. *Oregon*.—Joseph, 10.8. *Pennsylvania*.—Blue Knob, 86; Eagle's Mere, 65.2; Somerset, 60; Le Roy, 57.1; Philipsburgh, 51.5; Troy, 50; Indiana, 49.7; Wellsborough, 48.8; Rimersburgh, 45; Lock Haven, 42.8; Johnstown, 42; Pittsburgh, 41.3; Grampian Hills, 41; Hollidaysburgh, 36.7; Charlesville and Dyberry, 35.5; Salem Corners, 34.8; Allegheny Arsenal, 34.7; Huntingdon, 33.5; State College, 32.6; Catawissa, 32; Smethport, 31.5; Emporium, 31.2; Nisbet, 31; Wysox, 29.5; Meadville (2), 29.2; McConnellsburgh, 26; Blooming Grove and Petersburg, 25; Greenville and Uniontown, 24.5; Du Bois and South Eaton, 24; Girardville, 23.7; Kilmer, 23.6; Carlisle, 23; Lewisburgh, 22.9; Ligonier, 22.3; Selin's Grove, 21; Honesdale, 20; Wilkes Barre, 19.8; Oil City, 19; York, 18.5; Aqueduct, 17; New Castle, 16.9; Harrisburg, 15; Myerstown, 14; Coatesville, 12.6; Corry and Westtown, 12; West Chester, 11. *Rhode Island*.—Pawtucket and Providence (1), 10. *South Carolina*.—Belmont, 1. *South Dakota*.—Scranton, 10.5. *Tennessee*.—Rogersville and Springdale, 6. *Texas*.—Coldwater, 3.2. *Utah*.—Alta, 24; Park City, 14.2. *Vermont*.—Jacksonville, 38; Northfield, 36.2; Chelsea, 36; Hartland, 35; Lunenburg, 31; Strafford, 30; East Berkshire, 27.6; Burlington, 25; Cornwall, 22; Brattleborough (1), 12.2. *Virginia*.—Bolar, 47.9; Salem, 36.1; Staunton, 36; Dale Enterprise, 28.5; Lexington, 26.2; Woodstock, 21.5; Lynchburgh, 13.5; Mossing Ford, 12. *West Virginia*.—Ella, 32.2; Tannery, 31.8; Glenville, 25; Wheeling, 22. *Wisconsin*.—De Pere, 10. *Wyoming*.—Cheyenne and Laramie, 1.

The first snow of the season was reported as follows: 1st, Oregon, Mo.; Readington, N. J.; Kenton, Ohio; Salem, Va. 2d, Amana and McCausland, Iowa. 3d, Springfield, Ill.; Casanova, Va. 4th, Teviston, Ariz.; Columbia, Mo. 5th, Mount Turnbull (near San Carlos), Ariz. 6th, Show Low, Fort Bowie, Fort Grant, and Fort Thomas, Ariz.; Dodge City, Cunningham, and Oswego, Kans.; Sarcovie, Mo.; Oklahoma City, Okla. T.; Panhandle and Silver Falls, Tex. 7th, Mountain Home, Ala.; Fort Smith and Lead Hill, Ark.; Columbus and Sedan, Kans.; Louisville, Earlington, and Pearlinton, Ky.; Liberty, Oak Ridge, Saint Charles, Warrenton, Saint Louis, Springfield, Centreville, and Gordonville, Mo.; Fort Reno, Okla. T.; Riddleton, Tenn.; Bolar, Va. 8th, Cairo and Palestine, Ill.; Barren Creek Springs and Cumberland, Md.; Steelville, Mo.; Woodbury, N. J.; Soapstone Mount and Weldon, N. C.; Chattanooga, Tenn.; Lynchburgh, Norfolk, Birdsnest, Lexington, Mossing Ford, Stanardsville, Staunton, and Yancey's Mills, Va. 12th, Mesquite, Tex. 13th, Baker

City, Oregon. 16th, Atlanta and Lithia Springs, Ga.; Peoria, Ill.; Bryson City, Mount Pleasant, Oak Ridge, and Morganton, N. C.; Greenville, Belmont, Kirkwood, Simpsonville, and Spartanburgh, S. C. 17th, Diamond, Ga.; Charlotte, Raleigh, and Murphy, N. C. 24th, Topeka, Globe, La Harpe, Manhattan, Salina, and Wakefield, Kans.; Carrollton, Fayette, Fortescue, Glasgow, Shelbina, and Stellada, Mo. 25th, Austin, Mo.; Cape Henry and Fall Creek, Va. 26th, Concordia, Kans. 30th, Grass Valley, Cal. 31st, Dos Cabezas, Ariz.

The following are among the more notable snow storms of the month: On the 3d 5.0 to 6.0 inches of snow fell in north and west New York, north Vermont, and north New Hampshire. Snow was reported in the mountain districts of north California from the 2d to 5th. On the 6th and 7th a heavy snow storm prevailed in southwest Missouri, north Arkansas, Indian Territory, and southeast Kansas, a depth of 7.0 to 10.0 inches being reported. From the 16th to the 18th a heavy snow storm prevailed from North Carolina to New York and westward over the upper Ohio valley. In west North Carolina 5.0 to 8.0 inches fell; in West Virginia the depth was 13.0 to 22.0 inches; in west and southwest Virginia 15.0 to 36.0 inches; at Roanoke, Va., the roof of the Roanoke Machine Works was crushed in by the weight of snow and one man killed and several injured; other buildings also caved in at that place under the weight of the snow. At Troy, Pa., 32.0 inches fell; at Pittsburgh, Pa., the estimated depth from 10 a. m. of the 16th to 3 a. m. of the 18th was 16.5 inches. At State College, Ohio, 8.0 inches fell. Light snow was reported in north Georgia and west South Carolina. On the 17th and 18th heavy snow fell from east New York over north New England, and at mountain stations in Pennsylvania. At Farmington, Me., 15.5 fell; in north New Hampshire and east New York 11.0 to 14.0; and in Pennsylvania 14.0 to 26.0 inches were reported. At Murphy, N. C., a depth of 14.5 inches was reported during this storm. On the 23d and 24th a depth of 12.0 was reported at Harper's Ferry, W. Va. A heavy snow storm which prevailed in south Indiana, Illinois, and Ohio, and in Kentucky, south Missouri, Virginia, District of Columbia, and west North Carolina on the 24th and 25th extended over Pennsylvania, New Jersey, New York, and New England by the 26th and 27th. In central Kentucky snow changed into sleet on the 25th, and trees and electric wires were broken by the weight of ice. A depth of 10.0 was reported at Butlerville, Ind.; 10.0 at Caddo Creek, Ky.; 4.5 at Louisville, Ky.; 7.0 at Cincinnati, Ohio; 10.0 at Jacksonborough, Ohio; 7.0 at Columbus, Ohio; 11.0 at Pittsburgh, Pa.; 4.5 at Lynchburgh, Va.; 10.0 at Washington City; 13.0 at Cumberland, Md.; 12.0 at Mount Saint Mary's, Md.; 8.0 at Dale Enterprise, Va.; 10.0 at Staunton, Va.; 10.0 at Wheeling, W. Va.; 20.0 at Blue Knob, Pa.; 15.0 at Dyberry, Pa.; 7.0 at New Brunswick, N. J.; 13.0 at New York City; 11.0 at Rondout, N. Y.; 10.0 at Cooperstown, N. Y.; 9.0 at Ithaca, N. Y.; 9.0 at Boston, Mass.; 11.0 at Amherst, Mass.; 12.0 at Westborough, Mass.; 10.0 at Springfield, Mass.; 14.0 at Strafford, Vt.; 15.0 at North Sutton, N. H.; 16.0 at Hanover, N. H.; 14.0 at Antrim, N. H.; and 14.0 at Cornish, Me.

#### DEPTH OF SNOW ON GROUND AT CLOSE OF MONTH.

Chart IV shows the depth of snow reported on the ground at the close of the month. The greatest depth of snow was reported in southwest Me., north N. H., south Vt., central N. Y., northeast and south-central Pa., and west-central Idaho, where it exceeded 30.0. 20.0 was reported in north-central Va., and more than 10.0 in central and northeast Mass., central and north Conn., north N. J., west Md., northeast W. Va., east Ohio, east upper Mich., north-central Utah, and north-central N. Mex. Trace of snow was reported on the ground in the Atlantic coast states as far south as extreme south Va.; in the Ohio and Mississippi Valleys to north Ky. and south Ill.; in the Missouri Valley to northwest Mo.; on the eastern slope of the Rocky Mountains to northwest Tex.; in the plateau region to south-central N. Mex., south Utah, and central Nev., and in Cal., to about the 38th parallel.

*A. H. Hunt*

**HAIL.**

Hail was reported as follows: 3d, Ala., Cal., Fla., Ga., Miss., Tenn. 4th, Ariz., Kans. 5th, Ariz. 6th, Wash. 7th, Kans. 10th, N. J. 12th, Tex., Wash. 13th, Tex. 14th, Wash. 17th, N. C. 19th, Cal., Wash. 20th, Ariz. 26th, N. J., N. C. 29th, Nev., Wash. 30th, Ariz., Cal., Nev. 31st, Kans.

**SLEET.**

Description of the more severe sleet storms of the month is given under "Local storms." Sleet was reported as follows: 2d, Mich., Va. 3d, Conn., Ind., Me., N. H., N. J., N. Y., Ohio, Pa. 4th, Me., N. H. 5th, Me., N. H., N. J., Utah, Wis. 6th, Me., Mass., Pa., Tex. 7th, Ark., Ill., Ind., Ky., Tenn., Va. 8th, Ky., N. C., Va. 9th, N. C., Ohio. 11th, Mich. 12th, N. Y., Tex. 14th, Wash. 15th, Iowa, Mich., W. Va. 16th, Ind., N. C., Ohio, S. C., Tenn., Va., Wis. 17th, Conn., Me., Mich., N. Y., Pa., Vt., Va. 18th, Me., Mich., Pa., Vt. 19th, Mich. 20th, Mich. 21st, N. Y., Pa. 22d, Mich., Mont., N. C., Pa. 23d, N. J., N. Y. 24th, Ill., Kans., Ky., Mo., Tenn. 25th, Ind., Ky., Mo., N. J., N. C., Ohio, S. C., Va., W. Va. 26th, Conn., D. C., Iowa, Ky., Mass., N. H., N. J., N. Y., N. C., N. Dak., Pa., Tenn., Va., Wis. 27th, Me., Mass., N. H., N. Y., Pa. 30th, Mich. 31st, Colo., Iowa, Kans., La., Md., Minn., Mo., N. Mex., N. Y., Pa.

**MAXIMUM RAINFALL IN ONE HOUR OR LESS.**

The following table is a record of the heaviest rainfall during December, 1890, for periods of five and ten minutes and

one hour, as reported by regular stations of the Signal Service furnished with self-registering gauges:

Station.	Maximum fall in—					
	5 min.	Date.	10 min.	Date.	1 hour.	Date.
	Inch.		Inch.		Inch.	
Bismarck, N. Dak.	0.05	26	0.12	26	0.40	26
Boston, Mass.						
Buffalo, N. Y.						
Cincinnati, Ohio						
Chicago, Ill.						
Cleveland, Ohio	0.02	31	0.03	31	0.10	31
Denver, Colo.						
Detroit, Mich.						
Dodge City, Kans.					0.05	31
Duluth, Minn.						
Eastport, Me.						
Galveston, Tex.	0.20	24	0.35	24	1.30	24
Jupiter, Fla.	0.15	14	0.20	14	0.40	14
Key West, Fla.	0.04	4	0.07	4	0.22	4
Marquette, Mich.						
Memphis, Tenn.						
New York City	0.03	17	0.05	17	0.24	17
New Orleans, La.	0.30	5	0.50	5	1.25	25
Norfolk, Va.						
Philadelphia, Pa.						
Philadelphia Water Works	0.02	17	0.04	17	0.21	17
Portland, Oregon	0.05	23	0.06	23	0.20	23
Saint Louis, Mo.						
Saint Paul, Minn.						
San Diego, Cal.	0.05	4	0.10	4	0.30	4
San Francisco, Cal.	0.15	3	0.30	3	0.45	3
Savannah, Ga.	0.25	8	0.50	8	1.20	8
Washington City	0.10	17	0.10	17	0.20	17
Wilmington, N. C.					0.05	16

\* Not sufficient to register. † Rain-gauge not working. ‡ Less than .05 in 1 hour. ‡ No record on account of snow.

**WINDS.**

The prevailing winds during December, 1890, are shown on chart II by arrows flying with the wind. In New England and the middle Atlantic states the winds were generally from the northwest; in the south Atlantic states, from southwest to west, except on the North Carolina coast, where they were from the northeast; over the Florida Peninsula, from west to northwest; in the east Gulf states and on the middle Pacific coast, from northwest to north, except on the coast of north California, where they were from the southeast; in the lower Rio Grande valley and on the north Pacific coast, from east to south; in the Ohio Valley and Tennessee, the extreme northwest, on the southeast slope of the Rocky Mountains, and over the middle plateau region, from south to northwest, except at Winnemucca, Nev., where the prevailing direction was from the east; in the lower lake region, the upper Mississippi and Missouri valleys, and on the northeast slope of the Rocky Mountains, from southwest to northwest; on the middle-eastern slope of the Rocky Mountains, and over the southern plateau region, from southwest to north; over the northern plateau region, from southeast to southwest; on the south Pacific coast, from west to north; and in the west 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, 62, sw., at Fort Canby, Wash. 2d, 70, e., at Fort Canby, Wash. 3d, 66, e., at Fort Canby, Wash. 4th, 52, se., at Eastport, Me.; 58, w., at Wood's Holl, Mass.; 55, nw., at Block Island, R. I. 9th, 55, sw., at Fort Assinniboine, Mont. 11th, 54, e., at Fort Canby, Wash. 12th, 82, se., at Fort Canby, Wash. 13th, 54, sw., at Chicago, Ill. 14th, 64, se., at Fort Canby, Wash.; 50, nw., at Wood's Holl, Mass. 15th, 72, s., at Fort Canby, Wash. 16th, 60, sw., at Fort Assinniboine, Mont.; 70, s., at Fort Canby, Wash. 17th, 50, sw., at Fort Assinniboine, Mont.; 60, se., at Fort Canby, Wash.; 54, ne., at Boston, Mass.; 82, ne., at Block Island, R. I.; 52, ne., at New Haven, Conn.; 64, ne., at Harrisburg, Pa. 18th, 50, nw., at Block Island, R. I.; 60, s., at Fort Canby, Wash. 19th, 56, sw., at Fort Canby.

Wash.; 60, nw., at Wood's Holl, Mass. 20th, 76, s., at Fort Canby, Wash. 21st, 72, sw., at Fort Assinniboine, Mont.; 64, s., at Fort Canby, Wash. 23d, 50, nw., at Chicago, Ill.; 54, sw., at Buffalo, N. Y.; 51, sw., at Detroit, Mich.; 51, w., at Grand Haven, Mich.; 50, nw., at Sault de Ste. Marie, Mich. 25th, 50, sw., at Fort Assinniboine, Mont.; 60, w., at Helena, Mont.; 84, sw., at Fort Canby, Wash. 26th, 69, e., at Block Island, R. I.; 58, nw., at Bismarck, N. Dak.; 60, nw., at Fort Buford, N. Dak.; 52, nw., at Valentine, Nebr.; 54, nw., at Yankton, S. Dak.; 54, nw., at Fort Sully, S. Dak. 27th, 54, se., at Eastport, Me. 28th, 52, nw., at Wood's Holl, Mass. 31st, 60, w., at Abilene, Tex.

**LOCAL STORMS.**

On the 1st a violent wind and rain storm prevailed over Nova Scotia, Cape Breton Island, and Newfoundland. At Halifax the rain changed to snow, which drifted heavily. Great damage was caused to shipping along the coasts of the Canadian Maritime Provinces by heavy wind and high seas. On the morning of the 3d a violent thunder-storm moved eastward over Pensacola, Fla., with hail about the size of peas, and wind reaching a velocity of 44 miles per hour. A heavy w. to n. gale swept over southeast Massachusetts on the 4th. At Wood's Holl, Mass., a heavy gale, reaching 58 miles per hour, and snow, changing into rain, prevailed. Two schooners went ashore near that place and were abandoned by their crews. On the 5th a heavy rain and thunder-storm passed over Farmerville, Union Co., La., and a violent wind storm, causing damage to out-buildings, was reported at Love's Lake, Red River Co., La. On the 8th, at 9 p. m., central time, a storm moved ne. over Jersey, Walton Co., Ga., damaging buildings to the extent of about \$500, and killing one person. The path of greatest destruction was about two miles in length and about 50 yards in width. Articles were carried upward and to the north, and the storm had a whirling motion from right to left. On the 12th a high wind, reaching 45 miles per hour, prevailed in New York City. In Brooklyn a building in course of erection was blown down and one person killed. On the 13th a heavy sw. gale prevailed at Grand Haven, Mich., with a maximum velocity of 48 miles per hour.