

mington. *South Carolina*: 89° at Charleston. *Georgia*: 91° at Augusta. *Florida*: 90° at Jacksonville and 91° at Key West. *Alabama*: 91° at Mobile. *Mississippi*: 93° at Vicksburg. *Louisiana*: 95° at *Okalooska. *Texas*: 104° at *Mesilla. *Ohio*: 88° at *Bellefontaine, *Ruggles and *Ringgold. *Kentucky*: 83° at Louisville. *Tennessee*: 88° at Knoxville. *Arkansas*: 88° at Little Rock. *Michigan*: 85° at Alpena. *Indiana*: 80° at Indianapolis and 84° at *Laconia. *Illinois*: 86° at *Peoria and *Anna. *Missouri*: 93° at *Independence. *Kansas*: 97° at *Holton. *Wisconsin*: 82° at *Beloit. *Iowa*: 90° at *Vail. *Nebraska*: 93° at *Howard. *Indian Territory*: 95° at Fort Sill. *Minnesota*: 78° at St. Paul. *Dakota*: 95° at Ft. Buford. *Colorado*: 89° at Denver. *New Mexico*: 105° at La Mesilla. *Wyoming*: 87° at Cheyenne. *Utah*: 91° at Salt Lake City. *Nevada*: 97° at *Carson City. *Arizona*: 113° at Yuma. *Idaho*: 92° at Boise City. *California*: 92° at San Diego and 105° at Red Bluff. *Oregon*: 90° at Roseburg.

Ranges of Temperature at Signal Service Stations.—The monthly ranges will appear from an examination of the maxima and minima just given. The greatest daily ranges vary in New England from 16° at Wood's Holl to 19° on Mt. Washington and 29° at Boston; Middle Atlantic States, from 20° at Barnegat to 33° at Washington; South Atlantic States, from 13° at Portsmouth, N. C., to 25° at Jacksonville, and 31° at Charlotte; Gulf States, from 13° at Key West to 17° at New Orleans and 33° at Corsicana; Ohio valley and Tennessee, from 25° at Cairo, Louisville and Cincinnati to 37° at Pittsburgh and Knoxville; Lower Lake region, from 20° at Toledo to 30° at Rochester; Upper Lake region, from 23° at Madison to 30° at Chicago and Duluth and 33° at Alpena; Upper Mississippi valley, from 24° at Springfield, Ill., to 31° at St. Paul and 33° at Des Moines; Lower Missouri valley, from 30° at Leavenworth to 38° at Yankton; Northwest, from 41° at Bismarck to 46° at Pembina; Eastern Rocky Mountain slope, from 31° at Denison, 38° at Fort Sill to 35° at Deadwood and 46° at North Platte; Rocky Mountains, from 26° on Pike's Peak to 40° at Santa Fé and 44° at Cheyenne; Plateau Districts, from 34° at Pioche to 39° at Boise City and 54° at Winnemucca; California, from 26° at San Francisco to 36° at Los Angeles and 40° at Red Bluff and Visalia.

Frosts—were quite frequent over the northern portions of the country, and during the latter part of the month very generally destructive to vegetation, as will be seen from the following summary: On the 26th and 27th, they were experienced as far south as Tennessee, Georgia and South Carolina. In New England frosts occurred on the 5th, 7th, 10th and from the 20th to 27th, and were destructive to vegetation on the 21st, 25th, 26th and 27th. In New York and Pennsylvania, from the 4th to the 28th; destructive, 11th, 12th, 21st, 25th, 26th, 27th. Maryland, Virginia and West Virginia, 10th, 11th, 25th, 26th, 27th. North Carolina, 24th, 25th, 26th, 27th, 28th. South Carolina and Georgia, 26th and 27th. Tennessee, 14th and 26th. Ohio valley, 5th, 9th, 10th, 11th, 15th, 19th, 21st, 25th, 26th; destructive, 15th, 25th and 26th. Lower Lakes, 4th to 29th; destructive, 11th, 12th, 24th and 25th. Upper Lake region, 5th, 7th, 8th, 9th, 10th, 11th, 15th, 17th to 26th; destructive, 5th, 7th, 19th, 20th, 21st, 24th, 25th. Upper Mississippi valley, 4th to 26th; destructive, 14th, 19th, 20th, 24th, 25th and 26th. Lower Missouri valley, 6th, 8th, 12th, 13th, 17th, 18th, 20th, 24th; destructive, 20th and 24th. Extreme Northwest, 3rd, 4th, 5th, 7th, 8th, 12th, 18th, 19th, 20th, 22nd, 23rd, 24th, 29th, 30th. Colorado, at Summit, every night; summit of Pike's Peak, 3rd, 12th, 13th, 20th, 25th. Idaho, 11th, 12th, 30th. Utah, 26th, 27th. Nevada, 11th, 12th, 13th, 27th, 30th.

Ice occurred as follows:—On the 9th, at Neillsville, Wis., $\frac{1}{8}$ of an inch in thickness. 12th, Winnemucca, Nev. On the 13th, at Pembina, on pools. 14th, Cresco, Ia., $\frac{1}{10}$ in., and at Port Madison, Ia., $\frac{1}{8}$ in. 17th, Idaho City, Idaho. 19th, Cresco, Ia., $\frac{1}{4}$ in., Nora Springs, Ia., and Litchfield, Mich. 20th, Belvidere, Ill., Litchfield, Mich., Plattsmouth and Genoa, Neb., and Burlington, Ia. 21st, Litchfield, Mich., and Waterburg, N. Y. 23rd, Logansport, Ind.; Pembina, 1 inch; Clear creek, Neb. 24th, Muscatine and Burlington, Ia.; Independence, Ia., $\frac{1}{8}$ in.; Niles, Mich., $\frac{1}{4}$ in.; Litchfield and Ypsilanti, Mich.; Howard, Genoa and Clear Creek, Neb.; Pembina; Hanover, N. H. 25th, Elmira, Ill.; Belvidere, Ill., $\frac{1}{2}$ inch; Wabash, Ind.; Litchfield and Hudson, Mich.; Ashley, Mo.; Ithaca, N. Y., $\frac{1}{4}$ inch; Nile, N. Y., $\frac{1}{8}$ in.; Urbana, Ohio; Pittsburg, $\frac{1}{16}$ in.; Burlington, Vt. 26th, Gardiner, Me.; Eastport, $\frac{1}{8}$ in.; Westborough, Mass., $\frac{1}{8}$ in.; Linden and Somerville, N. J.; Waterburg and Palermo, N. Y.; Hulmesville, Pa.; Woodstock and Burlington, Vt., $\frac{1}{4}$ in; Contoocookville, N. H., $\frac{1}{2}$ in. 27th, Coalville, Utah, $\frac{1}{4}$ in. 30th, Winnemucca.

Ground was frozen on the 24th at Litchfield, Mich., on the 25th, at Contoocookville, N. H., Williston Vt., and Litchfield, Mich.; 26th, at Strafford, Vt.; Dyberry, Pa., to a depth of 1 inch.

PRECIPITATION.

The general distribution of rainfall for the month is illustrated as accurately as possible on Chart No. III, from about 500 Signal Service and voluntary reports; it is accompanied by a table giving the average precipitation for the month of September by districts, which shows the rainfall for the month to have been in excess in the South Atlantic and Eastern Gulf States, and on the coast of Oregon. In the Northwest and the Middle Atlantic States, this table shows a decided deficiency, but by reference to the chart, other extensive areas, not included in these districts, will be found to have experienced a great want of rain, which, however, in taking an average of the district, have been compensated for by heavy rains in some other portions of the same district. Thus in the Eastern Gulf States, while a large part of Mississippi had over six inches portions of Alabama and Georgia had less than one inch, and this applies to nearly all the different sections. In consequence of this uneven distribution of rain, severe droughts have occurred and great loss has resulted to stock and crops. This is especially the case in portions of Pennsylvania, Virginia and North Carolina, in Illinois, Missouri, Indian Territory and Texas and in Utah. Special reference to these will be found under the proper heading.

Special Heavy Rains.—On the 1st and 2d, at Vicksburg, Miss., 3.99 inches; Ashwood, Tenn., 4.00 in.; Brookhaven, Miss., from 5 a. m. of the 1st, to 4 a. m. of the 2d, 6.05 in.; St. Marks, Fla., 4.08 in. 1st to 3rd, Arlington, Ind., 3.85 in.; Laconia, Ind., 4.80 in.; St. Meinrad, Ind., 5.35 in.; Fort Wayne, Ind., 4.30 in.; Margaretta, Ohio, 3.19 in.; Nashville, Tenn., 3.83 in.; Indianapolis, Ind., 5.09 in.; Louisville, Ky., 3.55 in. 2d and 3rd, Detroit, Mich., 3.88 in. 5th, Waterville, Kan., 1.94 in. in 2½ hours. 7th and 8th, Alpena, Mich., 3.68 in. 8th, St. Marks, Fla., 1.98 in. in 2 hours 40 minutes. 9th, San Antonio, Tex., 2.40 in. 10th, Booneville, Mo., 2.55 in. 11th, Corning, Mo., 3.30 in.; Indianola, Tex., 3.79 in. 11th to 13th, Brookhaven, Miss., 3.90 in.; St. Augustine, Fla., 3.32 in. 13th and 14th, Gulf Hammock, Fla., 4.25 in. 18th and 19th, Key West, Fla., 4.20 in. 20th and 21st, Cape Hatteras, N. C., 5.25 in. Cape Lookout, N. C., 5.06 in.; Wilmington, N. C., 4.26 in.; Charleston, S. C., 4.42 in. 24th, Brownsville, Tex., 4.02 in. 26th, Daytona, Fla., 2.98 in. Rio Grande City, Tex., 1.93 in. in 35 minutes. 26th and 27th, Niles, Mich., 3.10 in. 28th and 29th, Socorro, N. M., 1.94 in.

Largest Monthly Rain-falls.—Punta Rassa and Daytona, Fla., 13.78 inches; Brownsville, Tex., and Cape Hatteras, N. C., 11.64; Mayport, Fla., 11.51; Okahumpka, Fla., 10.50; Brookhaven, Miss., 9.95; St. Marks, Fla., 9.82; Key West, Fla., 9.71; Fayette, Miss., 9.00; Gulf Hammock, Fla., 8.97; Cape Lookout, N. C., 8.82; Jacksonville, Tenn., 8.24; Alpena, Mich., 8.00; Fayetteville, N. C., 7.75; Indianola, Tex., 7.27.

Smallest Monthly Rain-falls.—Within the limits of the lines marked zero upon Chart No. III, and embracing portions of California, Nevada, Colorado and Wyoming, only one station (Truckee in the Sierra Nevadas) reports any rain-fall. The following stations report very small monthly rain-falls:—San Francisco, and Red Bluff, Cal., Pioche, Nev., and Fort Buford, a trace; Winnemucca and Salt Lake City, 0.01; Denver, Col. 0.02; Hermosa, Col., Fort Custer, Mont., and Pilot Point, Texas, 0.03; Fort Stevenson, Dak., 0.06; Bismarck, Dak., 0.07; Battle Mountain, Nev., 0.08; Graham, Texas, 0.09; Stockton, Texas, Beowawe and Carlin, Nev., 0.10; Yuma, Arizona, 0.11; Clarksville, Texas, 0.13; Boise City, Texas, 0.14; Albuquerque, N. M., 0.20; Knoxville, Tenn., 0.22; Henrietta, Texas, 0.24; Melissa, Texas, 0.25; Forsythe, Mo., 0.30; Deadwood, Dak., 0.32; Coleman, Texas, 0.37; Little Rock, Ark., 0.39; Dover, Del., Rockford, Ill., Mount Ida, Ark., and North Platte, Neb., 0.40; Fort Keogh, Mont., 0.44; Accotink, Va., 0.45; Fort Sill, Dak., 0.47; Snowville, Va., and Bolivar, Mo., 0.50; Virginia City, M. T., 0.51; McKavett, Tex., and Fort Warren, Mass., 0.52; Charlotte, N. C., 0.53; Okalooska, La., 0.55; Fort Gibson, I. T., 0.60; Prescott, Ariz., and Springfield, Mo., 0.68; Webster and Asheville, N. C., 0.70; Fort McPherson, Neb., 0.72; Tucson, Ariz., 0.74; Ringgold, Ohio, 0.81; Greensboro, N. C., 0.85; West Point, N. Y. and Corsicana, Texas, 0.88; Cairo, Ill., 0.93.

Rainy Days.—The number of days on which rain or snow has fallen varies as follows: New England, from 8 to 16; Middle Atlantic States, 6 to 10; South Atlantic States, 6 to 19; Eastern Gulf States, 7 to 22; Western Gulf States, 1 to 10; Ohio valley and Tennessee, 4 to 9; Lower Lake region, 12 to 18; Upper Lake region, 11 to 20; Upper Mississippi valley, 6 to 13; Missouri valley, 1 to 8; Red River of the North valley, 7 to 9; Eastern Rocky Mountain slope, 1 to 9 in Texas, 1 to 3 in Indian Territory, and 1 to 4 thence northward to Dakota; Rocky Mountains, 0 to 4; Plateau Districts, 1 to 2; California, 0 to 1; coast of Oregon and Washington Territory, 5 to 10.

Cloudy Days.—The number varies in New England, from 2 to 18; Middle Atlantic States, 4 to 8; South Atlantic States, 7 to 16; Eastern Gulf States, 5 to 13; Western Gulf States, 0 to 9; Lower Lake region, 8 to 11; Upper Lake region, 5 to 11; Ohio valley and Tennessee, 2 to 10; Upper Mississippi valley, 3 to 7; Missouri valley, 0 to 8; Red River of the North valley, 4 to 5; Eastern Rocky Mountain Slope, 0 to 8 in Texas; 0 to 3 in Indian Territory, and 1 to 4 northward to Dakota; Rocky Mountains, 0 to 4; Plateau Districts, 0 to 2; California, 0 to 3; coast of Oregon and Washington Territory, 7 to 9.

Hail fell on Pike's Peak on the 3rd, 10th and 19th; at Ft. Davis, Tex., 30th; Logansport, Ind., 18th; Madison, Wis., 16th; Alpena, 7th; New Haven, 8th; Ft. Brady, Mich., 17th and 20th; Summit, Col., 18th; Belvidere, Ill., 27th; Anna, Ill., 7th; Cresco, Iowa, 11th and 28th; Halton, Independence and Wellington, Kans., 11th; Fall River, Mass., 11th; Detroit, Ypsilanti and Kalamazoo, Mich., 13th; Kansas City, Mo., 12th; De Soto, Neb. 11th; Grafton, N. H., 17th; Princeton, N. J., 14th; Argyle, N. Y., 17th; Norwalk, Ohio, 13th; Lunenburg, Vt., 17th; Helvetia, W. Va., 7th; Portland, Or., 29th; Virginia City, 28th; Albany, Or., 9th.

Snow fell on the summit of Mt. Washington on the 20th and 24th; 25th, snow squalls, during which two inches of snow fell, occurred on the mountains near Strafford, Vt., and on the 29th snow fell on the mountains near Burlington, Vt.; on the summit of Pike's Peak, 8th, 23rd, 24th, 27th (very heavy snow-storm,) 28th and 29th; Colorado Springs, Col., 27th; near Ft. Garland, Col., 27th on the summits of Sierra Blanco and Baldy; Virginia City, Mont., 10th.

Depth of snow on ground at end of month.—On the summit of Pike's Peak 1 to 6 inches.

Droughts were severe and extensive. The observer at Litchfield, Pa., reports a severe drought throughout the month; at Wellsboro, Pa., on the 30th, wells and streams were exhausted, pasturage a failure, and farmers were already compelled to feed their stock with hay; at Mt. Solon, Va., dryest season experienced for thirty years, water transported from distant points. The observer at Belvidere, Ill., reports on the 30th that since August 10th there has been a continued scarcity of water, and crops and pastures are drying up.

The Missouri Weather Service reports an unusual drought over a tract of country within a radius of fifty miles of Springfield, resulting in the drying up of streams and wells, causing great inconvenience to stock raisers. At Ft. Gibson, Indian Ty., on the 10th, late vegetation was withering and becoming parched; streams and wells dry; on the 30th the long-continued drought was assuming very serious proportions. At Clarksville, Tex., it was the warmest September for the past ten years, and resulted in a very severe drought; only 0.13 inches of rain has fallen since the 9th of August. At Melissa, Tex., it was dry, dusty, and smoky from the 14th to 29th, and wells, streams, and cisterns became exhausted. At Corsicana, on the 30th the severe drought still continued. At Kanab, Utah, from 1st to 27th, drought was very severe; cattle are dying for want of water and food. Many streams exhausted which have not failed before since the country has been settled; the ground is very dry, and when ploughed up appears like ashes. At Coalville, Utah, 30th, excessive drought throughout the month; all crops a failure; everything suffering for water.

Floods.—Brookhaven, Miss., 1st and 2nd, heavy freshets doing great damage to crops, fences, &c; the loss of stock was very great; sheep, hogs and cattle were seen floating past Monticello, on Pearl river, for three or four days, at which place the water rose 19 feet in ten hours. St. Mienrad, Ind., 1st to 3rd, high water in creeks causing great damage to fences, cord-wood, lumber, &c. Frankfort, Ky., 2nd, heavy rain at night, doing much damage by flooding. Bardstown, Ky., 5th, heavy floods doing much damage.

Waterspouts.—At Newport, R. I., on the 11th, about 11 a. m., a waterspout was observed over the sea about 8 miles from shore, followed at 11:40 a. m. by a thunder storm at station, and at New Haven, Conn., also on the 11th, about 6 p. m., a waterspout was observed over the Sound about 6 miles from the mouth of the harbor. It was plainly visible for half an hour, and appeared to moved very slowly, when the approaching darkness shut it out from view. At Key West on the 24th, between 2 and 3 p. m., a waterspout was observed in harbor about 3 miles from shore.

RELATIVE HUMIDITY.

The percentages of mean Relative Humidity for the month range as follows: New England, 67 to 68; Middle Atlantic States, 66 to 83; South Atlantic States, 65 to 80; Eastern Gulf States, 69 to 83; Western Gulf States, 54 to 82; Ohio valley and Tennessee, 62 to 74; Lower Lakes, 67 to 73; Upper Lakes, 63 to 73; Upper Mississippi valley, 59 to 68; Lower Missouri valley, 51 to 59; Red River of the North valley, 66 to 73; Rocky Mountain Slope, 21 at Stockton, Tex., 72 at Boerne, Tex., 52 at Ft. Sill, 46 at Deadwood and 49 at Ft. Keogh; Plateau districts, 13 to 39; California, 34 to 79; Oregon, 68 to 70. *High stations* report the following averages, not corrected for altitude: Mt. Washington, 90.8; Pike's Peak, 46.5; Denver, 34.6; Santa Fe, 27.2; Cheyenne, 29.3.

WINDS.

The prevailing winds, at the Signal Service stations, are shown by the arrows flying with the wind on chart No. II. The prevailing direction is from the area of highest pressure, thus, over the South Atlantic States it is decidedly northeast, over the Gulf States, easterly, and over the Lower Lakes, Middle States and New England, southerly. In the Ohio valley and Upper Lake region, and over the Northwest and western Plateau, southerly and westerly or northwesterly winds predominated. In the Pacific States, except in the Sacramento valley, the direction is westerly.

Total Movements of the Air.—The following were the *largest* monthly movements in miles, recorded at the Signal Corps stations: Cape Lookout 11,258 miles; Portsmouth, N. C., 11,198; Kittyhawk, 10,430; Cape May, 9,063; Sandusky, 8,879; Cape Hatteras, 8,819; Sandy Hook, 8,574; Milwaukee, 8,401; Breckenridge, 8,248; Barnegat, 8,207; Indianola, 8,090; Stockton, 7,910; North Platte, 7,863. The *smallest* movements were: Laredo, Tex., 1,500; Visalia, Cal., 1,707; Nashville, 1,745; Deadwood, 1,754; Tucson, Ariz., 2,844; Lynchburg, Va. and Fredericksburg, Tex., 1,968; Uvalde, Tex., 2,037; Indianapolis, 2,314; Shreveport, 2,358; San Antonio, Tex., 2,389; Graham, Tex., 2,390.

Local Storms.—At Sandy Springs, Md., on the 3rd "a tornado occurred shortly before 6 p. m., after a light shower of rain—sun shining at the time; a dark cloud was first noticed coming from the SSW., shaped like a funnel, and of a color which varied from copper and reddish to black, whirling with great rapidity and advancing at the rate of 15 to 20 miles per hour. At frequent intervals a column appeared to rise from the earth, at first white like steam, but on connecting with the funnel exhibited many hues, as if illuminated in the interior by electricity. The noise as the tornado advanced was compared to that of an immense fire, or heavy freight trains passing over a bridge. The damage was confined to the destruction of trees, fences, &c., for a length of about six miles and from thirty to one hundred yards in width. Large trees were snapped and twisted off or torn up by the roots and the branches whirled 600 feet into the air and scattered over neighboring fields. The oldest inhabitant of this vicinity can recall no parallel." At Gettysburg, Pa., on the 4th, "a tornado demolishing a church and unroofing other buildings; path of storm, about 60 feet wide and extending in an irregular direction from south to north; cloud funnel-shaped." On the night of the 7th a severe thunder-storm passed over New Jersey, traveling in a general direction toward the northeast; in Morris County, glass was broken, corn and buckwheat crops damaged, several barns struck by lightning and burned.

Sand Storms occurred at Fort Garland, Col., 11th; Las Cruces, New Mex., 17th; Yuma and Phoenix, Arizona, 26th; Burkes, Arizona, 24th.