

MONTHLY WEATHER REVIEW.

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INTRODUCTION.

The general weather conditions which prevailed over the United States and Canada during August, 1883, are presented in this REVIEW, based upon reports received from the regular stations of the Signal Service, from the Canadian Meteorological Service, and from co-operating state weather services, and voluntary observers.

The more prominent meteorological features of the month have been:

1st.—The low mean temperatures which have prevailed over nearly the whole country, being most marked in the Missouri and upper Mississippi valleys.

2d.—The small monthly precipitation, which has been below the average in all parts of the country, except in the extreme northwest and in the northern and middle slopes; the districts of greatest deficiency being the Gulf States, Ohio and upper Mississippi valleys, and the upper lake region.

The most violent and destructive local storms of the month occurred in Iowa, during the night of the 7–8th, and in Minnesota, on the 21st, the latter causing the destruction of a large part of the town of Rochester, Minnesota, and the loss of about thirty lives.

Respecting the weather over the north Atlantic ocean, the month has been marked by a succession of storms, two of which (numbers vi. and viii. on chart ii.) were apparently tropical hurricanes. These were disastrous in their effects, especially near the banks of Newfoundland and along the coast of the United States. Many lives were lost and great damage done to shipping. The approximate paths of the centres of these storms are shown on chart ii.

Referring to the ice region of the north Atlantic, the diminution of reports indicate that icebergs are rapidly disappearing.

Under "notes and extracts" will be found an interesting report upon the climate of Palestine, by Mr. Selah Merrill, United States consul at Jerusalem.

In the preparation of this REVIEW, the following data, received up to September 20th, have been used, viz.: the regular tri-daily weather-charts, containing data of simultaneous observations taken at one hundred and twenty-two Signal-Service stations and fifteen Canadian stations, as telegraphed to this office; one hundred and fifty-one monthly journals, and one hundred and thirty-five monthly means from the former, and fifteen monthly means from the latter; two hundred and thirty-eight monthly registers from voluntary observers; fifty-seven monthly registers from United States Army post surgeons; marine records; international simultaneous observations; marine reports, through the co-operation of the "New York Herald Weather Service;" abstracts of ships' logs, furnished by the publishers of "The New York Maritime Register;" monthly weather reports from the local weather services of

Indiana, Iowa, New Jersey, Ohio, and Tennessee, and of the Central Pacific railway company; trustworthy newspaper extracts; and special reports.

ATMOSPHERIC PRESSURE.

[Expressed in inches and hundredths.]

The distribution of mean atmospheric pressure for the month of August, 1883, determined from the tri-daily telegraphic observations of the Signal Service, is shown by the isobarometric lines on chart iii. This chart exhibits three areas of barometric maxima, two of which are situated east of the Rocky mountains and are inclosed by the isobars of 30.05, and the third area occupies the north Pacific coast, where, at Portland, Oregon, the mean atmospheric pressure for the month was 30.1. Of the areas of barometric maxima east of the Rocky mountains, the larger extends from northern Ohio and Pennsylvania southward to central Georgia, and the smaller area covers Illinois and the lower Missouri valley. The highest barometric means reported from stations east of the Rocky mountains are: 30.07 at Cincinnati, Ohio; Knoxville, Tennessee; Saint Louis, Missouri, and Washington, District of Columbia; and 30.09 at Cairo, Illinois. An area of barometric minima covers the southern and central plateau regions as shown by the broken isobars of 29.85 and 29.9. Owing to the limited number of reports received from these districts, the isobars are broken to indicate doubt, but the reports at hand show the region of least pressure to cover Arizona, where monthly means of 29.81 and 29.84 occurred at Yuma and Fort Apache, respectively.

Compared with the mean pressure for July, there has been an increase in all districts except in Tennessee and the south Atlantic and Gulf States. In the Canadian maritime provinces, the Rocky mountain region, and on the Pacific coast, the excess varies from .01 to .05; it is greatest in the upper lake region, where it amounts to .10. The line of no change extends from the central part of southern Texas northeastward to the Atlantic coast near the southern boundary of Virginia. The deficiencies in the south Atlantic and Gulf states and in Tennessee vary from .01 to .07, and are greatest along the immediate Gulf coast and in Florida.

DEPARTURES FROM THE NORMAL VALUES FOR THE MONTH.

In New England and southward along the Atlantic coast to Georgia, the mean pressure has been slightly below the normal, the deficiencies varying from .01 to .03. From these districts westward to the Pacific coast, the mean pressure has been above the normal, except over the northern part of the upper lake region, where it has not differed from the normal. The increase over the normal has not exceeded .08, and has been greatest in the upper Mississippi and Missouri valleys, the northern slope, and north Pacific coast region.

BAROMETRIC RANGES.

The monthly barometric ranges have been greatest in the extreme northwest, and in the upper lake region; they have been smallest in southern California, and at stations on the coast of the Gulf of Mexico. The extremes for the month are: greatest, 1.09 at Saint Vincent, Minnesota; smallest, 0.19 at Los Angeles, California.

The monthly ranges have varied in the different districts as follows:

New England.—From 0.57 on the summit of Mount Washington, New Hampshire, to 0.67 at Portland, Maine.

Middle Atlantic states.—From 0.45 at Cape Henry and Norfolk, Virginia, to 0.66 at New York City.

South Atlantic states.—From 0.33 at Atlanta, Georgia, to 0.40 at Hatteras, North Carolina.

Florida peninsula.—From 0.27 at Key West, to 0.37 at Sanford.

Eastern Gulf.—From 0.29 at Vicksburg, Mississippi, to 0.33 at Mobile and Montgomery, Alabama, and Pensacola, Florida.

Western Gulf.—From 0.29 at Palestine, Texas, to 0.36 at Little Rock, Arkansas.

Tennessee.—From 0.30 at Chattanooga to 0.34 at Memphis.

Ohio valley.—From 0.39 at Louisville, Kentucky, to 0.42 at Indianapolis, Indiana, and Columbus, Ohio.

Lower lakes.—From 0.47 at Sandusky, Ohio, to 0.63 at Oswego, New York.

Upper lakes.—From 0.53 at Chicago, Illinois, to 0.90 at Marquette, Michigan.

Extreme northwest.—From 0.60 at Fort Buford, Dakota, to 1.09 at Saint Vincent, Minnesota.

Upper Mississippi valley.—From 0.34 at Cairo, Illinois, to 0.85 at Saint Paul, Minnesota.

Missouri valley.—From 0.54 at Leavenworth, Kansas, to 0.74 at Yankton, Dakota.

Northern slope.—From 0.41 at Cheyenne, Wyoming, to 0.57 at Fort Custer, Montana.

Middle slope.—From 0.25 on the summit of Pike's Peak, Colorado, to 0.47 at West Las Animas, Colorado.

Southern slope.—From 0.30 at Coleman city, Texas, to 0.34 at Fort Concho, Texas.

Southern plateau.—From 0.19 at Fort Apache, Arizona, to 0.37 at El Paso, Texas.

Northern plateau.—From 0.46 at Dayton, Washington Territory, to 0.49 at Spokane Falls, Washington Territory.

North Pacific coast.—From 0.41 at Roseburg, Oregon, to 0.51 at Portland, Oregon.

Middle Pacific coast.—From 0.32 at Cape Mendocino and San Francisco, California, to 0.37 at Red Bluff, California.

South Pacific coast.—From 0.19 at Los Angeles, California, to 0.33 at Yuma, Arizona.

AREAS OF HIGH BAROMETER.

Although the areas of high barometer during the month have been of considerable extent, the pressure has not been very marked. Only three areas are of sufficient importance to merit description. These were accompanied by areas of low barometer.

I.—This area made its appearance in the extreme northwest on the afternoon of the 1st. On the morning of the 2d it extended over the northern portions of the upper lake region, Mississippi and Missouri valleys. On the 3d it embraced Tennessee and the Ohio valley, the lake region, the Mississippi and Missouri valleys. The general direction of the movement was southeasterly and it passed off into the Atlantic on the 8th. Cool weather prevailed in all districts during its progress, the temperature falling 10° to 20°.

II.—The morning report of the 12th showed the barometer to be above the normal in the extreme northwest, and on the 13th the pressure increased to from .2 to .3 of an inch above the normal, the centre being in Minnesota. On the morning of the 14th the centre was over Lake Huron, and the area extended over all districts east of the Mississippi valley. The area moved in an easterly direction, the centre passing over New England and Nova Scotia, and disappeared on the 16th. Light frosts occurred in the upper lake region, Canada, and northern portions of the New England states during its progress.

III.—This area first made its appearance east of British Columbia. The morning report of the 25th showed it had moved easterly and was central near Manitoba. On the 26th the greatest pressure was over Lake Superior, and on the 27th it had moved to the Saint Lawrence valley, and passed off into the Gulf of Saint Lawrence on the 29th.

AREAS OF LOW BAROMETER.

Seven areas of low barometer have been traced during the month, and the tracks of the centres are shown on chart number i. In but one instance has an area of low barometer appeared in the Southern states, that described as number iii. The majority of these areas moved in a direction north of east, the two exceptions being numbers vi. and vii. Numbers v. and vi. were the most violent during the month.

The following table shows the latitudes and longitudes in which each depression was first and last observed, and the average hourly velocity of each depression:

Areas of low barometer.	First observed.		Last observed.		Average velocity in miles per hour.
	Lat. N.	Long. W.	Lat. N.	Long. W.	
No. I.	47 30	87 00	49 00	65 30	11.2
II.	44 30	92 00	48 00	63 00	27.7
III.	34 15	90 00	37 15	76 15	35.8
IV.	50 15	107 15	50 00	78 00	27.8
V.	45 15	97 00	51 30	63 45	36.5
VI.	48 00	97 00	34 30	75 00	29.0
VII.	52 00	107 15			
Mean hourly velocity					28.0

I.—The afternoon report of the 1st showed the barometer at Marquette, Michigan, to be .25 below the normal. Light rain had fallen during the previous eight hours in the northern portion of the upper lake region. On the morning of the 2d the centre of area was near Rockliffe, Canada, and the rain area extended over the lake region, Tennessee and the Ohio valley, and the middle Atlantic states. On the 3d the centre was north of Montreal; from thence it followed the course of the Saint Lawrence river, increasing somewhat in energy, and passed beyond the limits of observation on the 4th. Its passage over the country was not marked by any high winds on the lakes, but on the Atlantic coast the winds reached a velocity ranging from twenty-five to fifty-five miles an hour. The lowest barometer observed was 29.48 at Anticosti, Gulf of Saint Lawrence, on the 4th.

II.—An area of low pressure appeared in Colorado and Utah on the 9th, and remained stationary on the 10th. The morning report of the 11th showed a small trough extending in a northeasterly direction from Colorado to the upper Mississippi valley; the greatest depression, however, remaining central in Colorado. During the 11th the high area described as number ii. moved rapidly over the Missouri valley, dividing the low area into two parts, leaving a weak depression central in the upper Mississippi valley, while the greater depression remained stationary in Colorado, but gradually disappeared during the following day. At the afternoon report of the 11th the depression in the Upper Mississippi valley was central near Saint Paul, Minnesota; from thence it moved slowly eastward, accompanied by light rains, and on the morning of the 12th it was central over Lake Michigan. Its progress there became more rapid, and on the 13th the centre was at Quebec, having altered its course from an easterly to a northeasterly direction, and finally disappeared on the 14th. No high winds marked its passage, except on the New Jersey coast, where they reached a velocity of thirty-four miles. The lowest barometer was 29.69 at Bird Rock, Gulf of Saint Lawrence, on the 14th.

III.—This depression developed in the Northern portion of the state of Mississippi during the afternoon of the 15th, preceded by light rains. It moved rapidly in a northeasterly direction, and on the morning of the 16th it was central near Lynchburg, Virginia, and passed into the Atlantic during the day, increasing in energy as it approached the coast. It was accompanied by very heavy rains, especially on the coast, the precipitation at Kittyhawk being over eight inches in twenty-four hours. High northeasterly winds prevailed on the Atlantic coast during its progress.

IV.—This area cannot be traced further than the Saskatchewan valley, where it made its appearance in the afternoon of the 16th. The centre was east of Manitoba on the morning of

the 17th; on the 18th it was north of Lake Superior; from this point it changed its course to a more northeasterly direction, and the location of centre could not to be determined after the midnight report of the 18th. At no time was the centre within the limits of stations of observations. Light rains fell in the Missouri and Mississippi valleys, the lake region, and New England.

V.—On the 18th the barometer was considerably below the normal at the stations in the British territory north of Montana, and the direction of the wind showed that the centre of area was to the north of these stations, but could not be definitely located until the 19th, on which date it was north of Fort Garry, Manitoba. The barometer was quite low at Fort Garry, reading 29.09. This area cannot be traced farther, but as it passed off it left a secondary depression in the Missouri valley on the 21st. The area thus formed moved in a northeasterly direction, and on the morning of the 22d it was central over Lake Superior. Violent gales with rain marked its passage over the upper lakes. It continued in a northeasterly course and passed beyond the limits of observation on the 23d.

VI.—This area made its appearance on the morning of the 29th, in the extreme northwest, moving in a southeasterly direction, accompanied by rain. On the 27th it was central in Minnesota, on the 28th in Indiana, on the 29th in Virginia, and on the latter date passed into the Atlantic off the North Carolina coast, and undoubtedly united with the hurricane described as number viii. under "north Atlantic storms" which was raging on that date and was so disastrous to vessels in the Atlantic ocean, and in the vicinity of Newfoundland. Rain fell in nearly all the districts east of the Missouri valley, and high northeasterly winds prevailed on the Atlantic coast during the progress of the storm.

VII.—The reports from the Saskatchewan valley, on the afternoon of the 30th, showed the presence of an area of low barometer in that region. On the morning of the 31st the centre was north of Dakota. The area moved in a southeasterly direction, and at midnight of the 31st it was central in southern Minnesota. This storm increased considerably in energy after the midnight report of the 31st, and became quite violent upon reaching the lake region. Its further description will be found in the REVIEW for September.

NORTH ATLANTIC STORMS DURING AUGUST, 1883.

[Pressure expressed in inches and in millimetres; wind-force by scale of 0—10.]

Chart ii. exhibits the tracks of the principal depressions that have moved over the north Atlantic ocean during August, 1883. The location of the various storm-centres has been approximately determined from reports of observations furnished by agents and captains of ocean steamships and sailing vessels in the north Atlantic, and from other miscellaneous data received at this office up to September 21st. The observations used, are, in general, simultaneous, being taken each day at 7 h. 0 m. Washington, or 0 h. 8 m. p. m. Greenwich, mean time.

Of the eight depressions charted, five are traced from W. 65° northeastward to beyond the fifteenth meridian, and three, numbers i., ii., and iii., apparently developed to the eastward of W. 35°. Of the former, number vi. was a tropical hurricane which moved northwestward at a considerable distance from the coasts of the United States, and recurved probably near W. 67°, and in the latitude of the Bermudas. So far as can be determined from the data now at hand, low area viii. appears to have developed over the ocean between the Bermudas and the United States, and to have moved northward to about the forty-second parallel, when the course changed to the northeastward, and the disturbance swept over the banks of Newfoundland as a severe storm; it appears to have increased in energy as it moved over the ocean, and was probably identical with the violent storm encountered during September 1st and 2d, by vessels off the coasts of the British Isles. The two depressions above referred to displayed unusual violence throughout the entire period for which they are charted, and caused great loss of life, and immense damage to shipping.

As a peculiar feature of the hurricane charted as viii. may be mentioned the unusually high latitude to which it ascended before recurving to the eastward.

The weather over the North Atlantic during the month was in general stormy, and may be summarized as follows: 1st to 11th, moderate to strong breezes, generally southwest to west, occasional fogs; 12th to 18th, generally strong variable breezes increasing to strong gales, squally, rainy weather; 18th to 31st, strong breezes to heavy gales, cloudy or rainy weather, occasional fogs.

The following descriptions relate to the depressions charted:

I.—This depression first appeared on the 7th, between N. 45° and 55° and W. 25° and 35°. On that date the s. s. "Wisconsin" in N. 51° 2', W. 26° 45', reported barometer 29.59 (751.6), a fall of .45 inch during the preceding forty-eight hours; wind s. by w., force 5. Moving eastward during the day, the depression appeared off the western coast of Ireland, where it probably became merged in low area ii.

II.—This was a deep depression which appeared off the coast of northern Scotland on the 8th; the lowest barometric reading, 29.17 (740.9), was observed by the bark "Ottawa" in N. 59° 31', W. 11° 13', wind nne., force 4, cloudy. It probably moved over Scotland to the North sea.

III.—This depression was first noticed in about N. 48°, W. 30°, on the 11th, the centre of disturbance lying to the southward of the s. s. "Illinois," which reported, in N. 48° 09', W. 32° 05', barometer 29.64 (752.8); wind ne., strong breeze increasing to strong gale; barometer falling slowly. During the 11th the disturbance moved slowly northeastward, and on the 12th the centre passed close to the s. s. "Illinois." At 2 a. m. the wind backed to n., with very heavy rain and high sea; and at 6 a. m., in N. 49° 15', W. 26° 45', the barometer read 28.85 (732.8); wind hauling to wnw. and becoming light. The s. s. "Llandaff City," on the 11th had e. wind with heavy rain; at 1.32 a. m., of the 12th, in N. 50° 32', W. 23° 12', e. wind, force 6, fine weather, barometer 29.63 (752.6); at 7 a. m., (Greenwich mean time,) barometer 28.48 (748.8), wind nne., force 8; at 1.44 p. m., (Greenwich mean time,) in N. 50° 16', W. 25° 57', wind n., force 9, barometer 29.63 (752.6), rising. On the 13th the depression was central near N. 51° W. 20°; the s. s. "Daniel Steinmann," in about N. 51° 04', W. 19° 48', reported, 9 a. m., wind se., force 4, shifting, during a heavy rain squall at 0.30 p. m., to nw. and w. and increasing to force 9; at 7 p. m. barometer 28.32 (744.7); at midnight the squalls became less violent and wind moderated to force 3. The s. s. "Strassburg," in N. 50° 15', W. 18° 33', reported barometer 29.05 (737.9), wind ssw., force 6-7, light rain, squally. By the morning of the 14th the depression was off the northwestern coast of Ireland.

IV.—This is a continuation of the disturbance charted as low area ii., on chart i. of this REVIEW. On the 13th the depression occupied the Gulf of Saint Lawrence and the Maritime Provinces; it moved by a course slightly north of east to about N. 49°, W. 48°; where it was central on the 14th, causing moderate s. and sw. gales to the eastward as far as W. 40°, while moderate to strong nw. breezes prevailed to the westward of the fiftieth meridian. Moving northeastward during the 14th, the disturbance was shown near N. 54°, W. 34°, where the pressure ranged from 29.45 (748.0) to 29.6 (751.8). Moderate to strong sw. and w. gales were reported by vessels near the fiftieth parallel, and between W. 35° and W. 25°. On the 16th the storm-centre was moving slowly northeastward north of the fifty-fifth parallel; the sw. winds above referred to had now changed to nw., but showed no diminution in force, while sw. winds prevailed from W. 27° eastward to the British Isles. By the 17th the disturbance had passed to the northwest of the British Isles.

V.—This was probably a continuation of the disturbance charted as low-area iii., on chart i. On the morning of the 17th the depression was shown to the eastward of Nova Scotia, accompanied by rain and moderate to strong breezes. On the 18th the disturbance reached N. 49°, W. 45°; the reports indicate that it increased in energy as it moved eastward, the