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INTRODUCTION.

This REVIEW treats generally the meteorological conditions of the United States and Canada for September, 1888, and is based upon reports of regular and voluntary observers of both countries.

On chart i the paths of the centres of nine areas of low pressure are shown; the average number for September during the last fifteen years being 9.3.

Descriptions of the storms that occurred over the north Atlantic Ocean are also given, and their approximate paths shown on chart i, on which also appear the distribution of icebergs and the limits of fog-belts west of the fortieth meridian.

The West Indian hurricane of the 1st-7th, and the severe storm which occurred over mid-ocean during the first half of the third decade of the month, ~~are shown~~ with the heavy rains and gales in the south Atlantic and east Gulf states from the 7th to the 10th, inclusive, constituted noteworthy meteorological features for September, 1888. Fog was less frequently encountered along the trans-Atlantic routes than in the preceding month, and the eastern limit of the Arctic ice-field was largely contracted when compared with the average for corresponding months of previous years.

The distribution of mean temperature is shown on chart ii by dotted isothermal lines.

The month was warmer than the average September over the western part of the country, the maximum temperatures being the highest recorded in the Saskatchewan and middle Sacramento valleys, and in portions of the extreme north-western states and territories. Over the eastern part of the United States the mean temperature was below the normal, and in states lying south of the Great Lakes and the Saint Lawrence River the minima fell below those of previous years.

The distribution of rainfall for September, 1888, is exhibited

on chart iv, and the normal precipitation for eighteen years is shown on chart v.

The rainfall was deficient over a greater part of the country west of the Atlantic coast states. In the south Atlantic and east Gulf states the abnormally heavy rainfalls of the early portion of the month occasioned destructive freshets and caused considerable damage to crops.

Chart vi shows lines of equal annual depth of evaporation, in inches, based upon observations taken from July, 1887, to June, 1888, inclusive.

Commencing with July, 1888, the meteorological means for stations of the Signal Service have been determined from two daily observations taken at 8 a. m. and 8 p. m. (75th meridian time). These hours of observation have been permanently adopted, to supersede the former system of tri-daily observations taken at eight-hour intervals.

In the preparation of this REVIEW the following data, received up to October 20, 1888, have been used: the regular bi-daily weather-charts, containing data of simultaneous observations taken at 133 Signal Service stations and 19 Canadian stations, as telegraphed to this office; 178 monthly journals and 185 monthly means from the former and 19 monthly means from the latter; 364 monthly registers from voluntary observers; 71 monthly registers from United States Army post surgeons; marine records; international simultaneous observations; marine reports through the co-operation of the Hydrographic Office, United States Navy, and the "New York Herald Weather Service;" monthly weather reports from the local weather services of Alabama, Arkansas, Illinois, Indiana, Iowa, Kansas, Kentucky, Michigan, Minnesota, Mississippi, Missouri, Nebraska, New England, New Jersey, New York, North Carolina, Ohio, Pennsylvania, South Carolina, and Tennessee, and 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 September, 1888, as determined from observations taken daily at 8 a. m. and 8 p. m. (75th meridian time), is shown on chart ii by isobarometric lines. On July 1, 1888, the tri-daily observations of the Signal Service were superseded by observations taken bi-daily at the hours named. A protracted series of hourly observations has shown that the difference between the mean pressure obtained from two observations taken at these hours and that determined from tri-daily observations, taken at eight-hour intervals, is so small as to be practically inappreciable.

The mean pressure for September, 1888, was highest over the central and east-central portions of the country, where it rose, in localities, above 30.10, and reached a maximum of 30.12 at Lamar, Mo. The area of lowest mean pressure occupied the lower Colorado valley, where the values fell to

29.76 at Yuma, Ariz. The barometric gradients were steep over the extreme west-central and southwest districts, notably in northern California and southern Arizona; elsewhere they were gentle.

As compared with the pressure chart for August, 1888, a general increase is shown, except over the south Atlantic and east Gulf states, in the middle Saskatchewan valley, and along the Pacific coast. The greatest increase has occurred over eastern New England and the Canadian Maritime Provinces where it exceeds .15 inch, and in the middle Missouri valley and over portions of the middle and southern slope of the Rocky Mountains where it is more than .10 inch. In the regions of decrease the changes have been small, except over Florida where they exceed .05 inch.

As compared with the normal pressure for September, the mean barometer readings for the current month were above the