

MONTHLY WEATHER REVIEW,

SEPTEMBER, 1876.

WAR DEPARTMENT,

Office of the Chief Signal Officer,

DIVISION OF

TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE AND AGRICULTURE.

The present REVIEW is based on the meteorological data collected in the office of the Chief Signal Officer of the Army. Especially have the regular tri-daily charts been consulted, and the monthly journals and reports from four hundred and eighteen stations, classified as Voluntary Observers, Army Posts and Signal Service stations. The more prominent features in the meteorology of the month have been, first—the general prevalence of low pressures and low temperatures east of the Rocky Mountains; second, the unusual rain-fall of the Atlantic States; third, the destructive hurricane of the 16th and 17th.

Areas of low barometer.—During September eight areas of low barometer have been well developed. Five have passed along the northern limit of the signal stations; two have passed from Texas northeastward; the hurricane of the 12th to 18th passed from the Windward Islands east-northeast to the Bahamas, turning to the northeastward near the Georgia coast, and again northward over North Carolina to Washington, thence north-northwest to Buffalo, thence as a slight disturbance eastward to the Atlantic.

No. I.—The morning map of the 1st shows a depression moving southeastward over Canada; after extending as a trough from Pennsylvania to Vermont, it then passed northeast to the Gulf of St. Lawrence. The central low barometer seems to have rapidly fallen from 29.70 on the 1st, at 4:35 p. m., to 29.20 on the afternoon of the 2nd. Considerable rain fell in the Middle and Eastern States, and the highest winds were on the 2nd, 7:35 a. m., Cape May, N. W. 36; Sandy Hook, N. W. 30; at 4:35 p. m., Cape May, N. W. 40; Sandy Hook, N. W. 36; Kitty Hawk, N. 30.

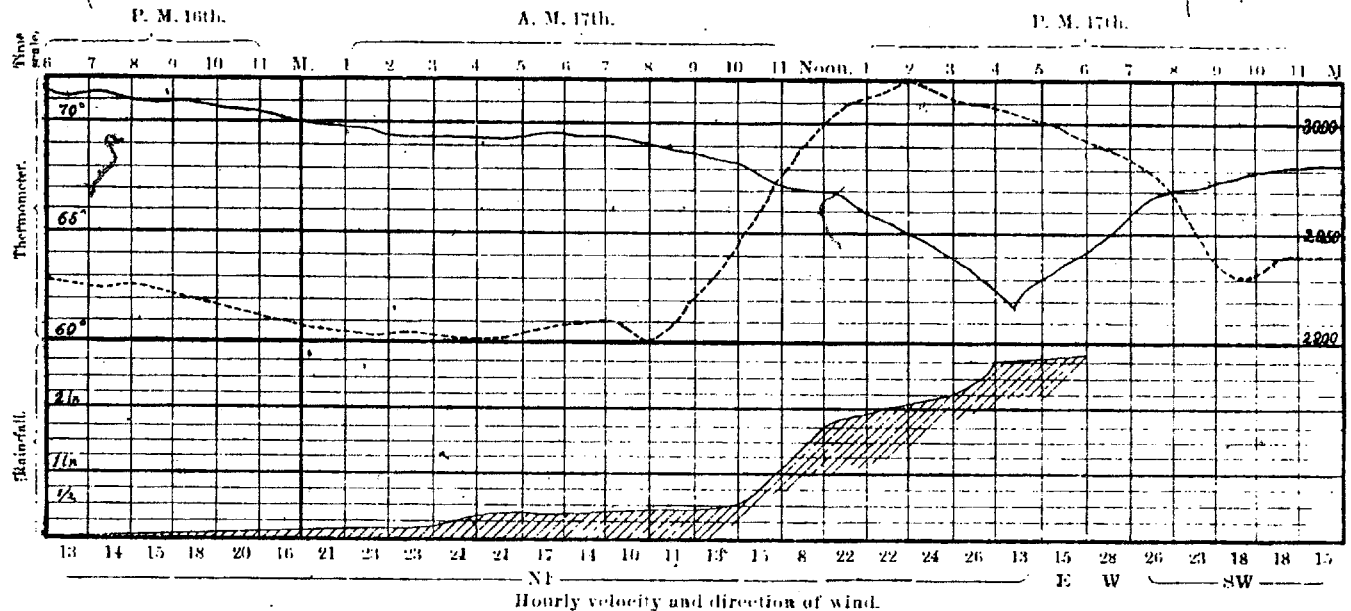
No. II.—The area of high pressure, No. I, having pushed the warmer air of the Mississippi valley west and northward, there were reported on the 2nd, at 4:35 p. m., cloud and rain in Nebraska, Kansas and Colorado, while in Manitoba appeared to be the central region of low pressure, which during the next twenty-four hours moved eastward over Lake Superior, but extended as a trough-southwestward to Nebraska. Preserving its long, oval shape, it moved eastward over the Lower Lakes and was, on the 4th, in the afternoon, central near the mouth of the St. Lawrence. High winds were not reported in connection with this depression.

Nos. III, IV and V.—On the southwest side of high barometer No. II, the cold easterly winds produced cloudy weather and numerous light rains, on the afternoon of the 4th, as they ascended toward the crest of the Rocky Mountains; at 11 p. m. warm southerly winds prevailed in Kansas and Nebraska and the cold northwest winds of Colorado were attended with cloud and rain, and the barometric depression appears central near the border of these three States. During the 5th and 6th the barometer fell in all directions from this central region, but the area of greatest depression seems not to have moved any considerable distance, nor can its path be satisfactorily plotted until the afternoon of the 8th, at which time the pressure had begun to rise decidedly on the north and west sides of the depression which is now numbered V, and whose subsequent track is given on chart No. I. Its course was approximately eastward, and was traversed quite slowly. The attending area of cloud and rain was quite extensive, covering on the afternoon of the 10th the Northwest, the Lake region, the Mississippi and Ohio valleys and the Atlantic States. Owing to the extensive area of high pressure in British America the winds on the Lakes continued pretty steady N. and N.E. from the 7th to the 12th; no steep gradients and but few brisk winds were reported up to the time the depression left the North Carolina coast. The phenomena observed from the 3d to the 8th in Colorado, Kansas and Nebraska were about as follows: Southerly winds extended from the Texas coast northward into Kansas, with maximum temperatures of 95° to 98° during those days, and clear or partly cloudy, dry weather; northerly winds, with maximum temperatures steadily diminishing in Nebraska from 85° on the 5th, to 58° on the 8th. Cloudy and rainy weather prevailed from Nebraska northward to the British Possessions. Central and northern Kansas appears to have been the region of neutral ground between these conditions, and the observer at Great Bend states, that on each afternoon from the 5th to the 8th, the wind gradually veered from the south to the northwest or north, and (probably on the latter date) to the northeast; on each day, also, a long line of cloud extending from south of west to east, gathered to the south of the station, from which thunder-showers and slight whirlwinds or tornadoes started out, moving to the eastward at the rate of about 4 miles per hour. After the 4:35 p. m. report of the 8th, the weather charts show that the cold air accumulating to the northward flowed in a steady current over western Kansas, while the area of low pressure moved eastward. The opposition of northerly and southerly winds in the Missouri valley, was but one feature in the advance southeastward of a great area of cold air in British America. The region from Kansas northward to Lake Huron into Canada, constituted on the afternoon of the 7th a barometric trough, the northern end of which became separated the morning of the 8th from the southern end by the intrusion of northwest winds over the Lake region, and which subsequently moved eastward as an oval area of low barometer, whose track is given as No. IV upon chart No. I. Its movement

was far more rapid than that of No. V, and no high winds were reported in connection with it at the stations, but the maps from 11 p. m. of the 9th to 11 p. m. of the 10th, seem to indicate the passage of a storm-centre northeastward past Cape Breton, which may possibly have been the subsequent course of No. IV. The observer at Harbor Grace, Newfoundland, reports a severe gale on the 10th. The first indications of its approach was noted by him on the 9th at 4:35 p. m., at which time storm No. IV must have been central in longitude 60°, latitude 43°. Rain began at Harbor Grace on the 9th at 7 p. m., with increasing N.E. winds, which continued during the night without veering, and during Sunday, the 10th, with occasional heavy squalls; the aneroid barometer had fallen 0.7 in. Hurricanes were experienced on the 10th, in this neighborhood, by ocean steamers. During Monday, the 11th, the wind backed to strong NW. breezes.

No. VI.—Warm southerly winds prevailed for a short time on the 12th, from Texas to Missouri, while cold northerly winds, cloud and rain extended northward, with rising barometer, into British America. The lowest pressure on the 12th, at 11 p. m., was about 29.95 in Indian Territory, with high, cold northerly winds to the westward. This area of relatively low pressure moving northeastward, rapidly developed, on the 13th and 14th, into a well-marked storm-centre, within which the lowest pressure was 29.70. This depression passed over the Lakes and St. Lawrence valley on the 15th, accompanied by extensive light rains and no high winds; the isobars during the 14th and 15th included a narrow oval pointing nearly N. E.

No. VII.—This hurricane struck the coast of North Carolina, near Wilmington, early on the morning of Sunday, the 17th, but its presence had been perceptible so early as 4:35 p. m. of the 15th, when the Synopsis announced "indications of a severe disturbance to the east of Florida," after which date its movements were regularly predicted in the Probabilities, and the approach of severe winds forewarned by signals. As its centre passed directly over Washington between 4 and 6 o'clock of the afternoon of the 17th, the accompanying copy of the records of self-registering instruments will be interesting. A peculiar



interest attaches to this hurricane, inasmuch as it is one of the few that, after approaching the Atlantic coast, has been deflected to the northwest instead of to the northeast; a deflection which was partially anticipated, and is apparently accounted for by the presence of the area of decidedly high pressure north of the Alleghanies on the 17th, and the consequent heavy rains over the Middle States and Lower Lakes, with northeast winds. After remaining nearly stationary in western Pennsylvania and New York from 11 p. m. of the 17th to 7:35 a. m. of the 18th, the centre moved slowly eastward, and appears, so far as the land stations are concerned, to have degenerated into an area of less intense wind, rain and barometric depression, nor have any reports come to hand indicating its progress eastward over the North Atlantic beyond the course given on chart No. I. Its earlier history, so far as at present known, is as follows: Earlier than the 12th, there is little or no information, but that the hurricane must have existed sometime previous to that date is evident, not only from general considerations, but also from the following note: the British brig, *Mary M. Williams*, Captain Hanna, from New York for Bahia, was spoken on the 12th, latitude, 25° N., longitude, 43° W., after having been damaged in a hurricane. On the 12th the hurricane-centre approached the Windward Islands, from the southeast or east-southeast, being first felt at Antigua; the lowest barometer, 29.35, occurred at St. Kitt's, on the 12th, at 8:30 p. m., and at St. Thomas, 29.45, on the 13th, 4:30 a. m., up to which time the wind had remained steady from the N.E., with increasing force. At Porto Rico, (San Juan?) the lowest pressure was 29.49, on 13th, at 8:30 a. m., the wind veering from NNE., on the morning of the 12th, to N.E. and subsequently, at 9 a. m. of the 13th, to E. The destruction of crops and buildings is reported to have been very great at these islands. On the 14th, a light hurricane is reported

from Santiago de Cuba, and on the 15th, on the Bahama Banks; it therefore evidently passed somewhat more slowly in this portion of its course than is indicated by the first rough sketch of its track as given in chart No. 1, and if the newspaper accounts that have been received are reliable, according to which the hurricane wind, both at Santiago de Cuba and the Bahamas, veered from NE. to SE., it must be considered that the track of the centre lay further westward than that here given. In its passage along the South Atlantic coast, and especially on the 16th, 17th and 18th, very heavy easterly gales prevailed from Cape Hatteras to Cape Cod. The schooner, "Addie Fuller," Captain James Jorgenson, from Brunswick, Ga., to Boston, encountered the storm while north of Cape Hatteras, and, as her barometer has been well compared and reliable, it is worth noting that the lowest pressure recorded was 29.40 about 2 p. m. of the 17th, with a southerly gale of force 8, on a scale of 10. The position of the schooner was probably 100 miles east of the track of the centre of the hurricane. The SW. and NW. winds that succeeded the hurricane, were less violent and of shorter duration at stations in Virginia than in North Carolina. The anemometers at Wilmington and Cape Lookout were disabled at the height of the storm, after recording respectively N. 60 and SW. 73 miles. Other records of high velocities are as follows: The observer at Hampton, Va., reports lowest barometer (29.10 reduced to Signal Service standard) occurred at 1:20 p. m. of the 17th, the wind veering from NE. to SE., and by 4 p. m. to S.; at Washington, D. C., the records of the central office show that the lowest barometer was 29.15 about 4:35 p. m., during a period of calm which lasted from 4:50 to 5:50 p. m. after which the wind, which had been steady from the E., shifted to the W.; the maximum wind velocity was W. 36 miles. The lowest pressures were: Smithville, 29.24; Wilmington, 29.32; Cape Lookout, 29.46.