

# MONTHLY WEATHER REVIEW,

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(General Weather Service of the United States.)

WAR DEPARTMENT,

Office of the Chief Signal Officer,

DIVISION OF

TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE AND AGRICULTURE.

## INTRODUCTION.

In preparing this REVIEW the following data, received up to September 13th, have been used, viz: the regular tri-daily weather charts, containing the data of simultaneous observations taken at 132 Signal Service stations and 12 Canadian stations, as telegraphed to this office; monthly journals and means 143 and 156 respectively, from the former; reports from 37 Sunset stations; 213 monthly registers from Voluntary Observers; 17 monthly registers from United States Army Post Surgeons; Marine Records; International Simultaneous Observations; monthly reports from Voluntary Observers in, and the local Weather Service of Missouri; reliable newspaper extracts; special reports.

## BAROMETRIC PRESSURE.

Upon chart No. II is shown by the isobaric lines the general distribution of atmospheric pressure, as reduced to sea-level, for the month. The barometric pressure, as compared with the means of the seven preceding years, shows that the mean of the entire country has been abnormally low. Cincinnati only shows a normal pressure. The average deficiencies for the various districts are as follows: New England, 0.08 inch; Middle Atlantic States, 0.06; South Atlantic States, from 0.05 on the coast to 0.02 in the interior; Gulf States, 0.07; Tennessee and Ohio valley, 0.02; Lower Lake region, 0.04; Upper Lake region, 0.045; Upper Mississippi and Lower Missouri valleys, 0.06; Northwest, 0.07; Rocky Mountain Slope, 0.035; San Diego, Cal., 0.10; San Francisco, Cal., 0.08; Portland, Or., 0.11.

*The Local Barometric Ranges* were as follows: California from 0.25 of an inch at San Diego to 0.48 at Red Bluff; Oregon from 0.51 at Roseburg to 0.63 at Olympia; Northern and Middle Plateaux from 0.59 at Salt Lake City to 0.63 at Boise City; Southern Plateau from 0.34 at Tucson to 0.55 at Phoenix; Rocky Mountain Slope from 0.31 at Pike's Peak and 0.40 at Fort Davis to 0.74 at Dodge City and 0.85 at Cheyenne; Rio Grande valley from 0.48 at Rio Grande City to 0.55 at Brackettville; Western Gulf States from 0.55 at Indianola to 0.91 at Shreveport; Eastern Gulf States from 0.26 at Key West to 0.45 at Mobile; South Atlantic States from 0.42 at Augusta to 1.05 at Cape Lookout; Middle Atlantic States, from 0.47 at Philadelphia to 0.99 at Kittyhawk and 1.22 at Cape Henry; New England States from 0.51 at Springfield to 1.05 at Eastport, 1.07 at Newport and 1.13 at Wood's Holl; Ohio valley and Tennessee from 0.51 at Columbus to 0.76 at Cairo; Lower Lake region from 0.46 at Toledo to 0.63 at Oswego; Upper Lake region from 0.50 at Chicago to 0.75 at Alpena; Upper Mississippi valley from 0.49 at Davenport to 0.64 at St. Paul; Red River of the North valley from 0.63 at Pembina to 0.67 at Breckenridge; Lower Missouri valley from 0.63 at Leavenworth to 0.69 at Yankton.

*Areas of High Barometer.*—No areas of high barometer of particular energy have passed over the country during the month, but the four following are the most important:

No. I.—This area was present off the North Carolina coast on the morning of the 1st—Cape Lookout and Cape Hatteras barometers 0.29 abnormally high. This pressure remained nearly stationary until the morning of 2d. During this time fresh southeast to southwest winds, with partly cloudy weather and no rain, prevailed in the South Atlantic States, and fresh variable winds, mostly southerly, were reported from the Gulf States, with heavy rainfalls; that at St. Marks, amounting for the twenty-four hours ending at the afternoon report of the 1st, to 10.81 inches, being probably the heaviest ever reported from a Signal Service station in one day. On the 2d the pressure gradually dissipated, during which day fresh southerly winds, with cloudy weather and rain, generally prevailed in the South Atlantic States.

No. II.—At midnight of the 8th the area of high barometer, which had gradually appeared during the 7th and 8th in the extreme Northwest, was just within the limits of the Signal Service stations, and was central in Dakota—Breckenridge barometer 0.36 above the normal. Moving southeastwardly on the morning of the 9th it was central in the Lower Missouri valley—Leavenworth barometer 0.24 above the normal. On the morning of the 10th there was but slight change in the location of the center, but the area had extended eastward, and cool, clear weather prevailed over the whole country, except the Gulf States. A minimum temperature of 43° was reported at Saugeen. Its general path during the day was easterly; at the morning report it was central in Virginia—Lynchburg barometer 0.18 above the normal. By the morning of the 12th the area was passing off the North Carolina coast in advance of low area No. IV. This area induced minima temperatures generally in Texas, for parts of the Lower Lake region, generally in Tennessee, the Ohio valley, the Middle and South Atlantic States, and parts of New England.

No. III.—The afternoon of the 14th an area of high pressure suddenly appeared in the Upper Lake region. At midnight of that date the pressure at Bismarck was 0.17 above the normal. At that time, in connection with this area and low area No. V, then forming in the Southwest, brisk north to east winds prevailed in the Upper Lake region, with maximum velocity of NE. 27 miles at Escanaba. During the 15th the area extended itself gradually eastward over the Lake region, while low area No. V moved slowly eastward. Brisk to high east to northeast winds, with cloudy weather and rain, prevailed in the Lower Lake region. Signals hoisted in the afternoon of the 16th, were fully justified, as shown in the description of low area No. V. During the 17th, this area gradually dissipated while low area No. V disappeared. This area produced the minima temperatures of the month for the Northwest, the Upper Missouri valley, the Lake region, parts of the Mississippi valley and New England. Frosts were reported on the 16th from stations in Iowa, Wisconsin, and Michigan, in which latter state some damage was done on low grounds to vegetation, particularly in Lansing and surrounding townships.

No. IV.—This area appeared in the Northwest on the morning of the 26th in the rear of low area No. IX. Moving very slowly southeastward it was central during the 28th in Tennessee and the Ohio valley. Generally cool and partly cloudy weather, with no dangerous winds marked its passage during these dates. It remained nearly stationary until the 30th.—Cincinnati barometer fluctuating from 0.15 to 0.30 above the normal. On the morning of the 31st it had disappeared.

*Areas of Low Barometer.*—Eleven areas have been sufficiently marked to merit description, but the centres of only six have followed tracks well enough defined to enable them to be properly located from reports yet received. The tracks of these six are shown on Map No. I.

No. I was a continuation of area No. IX, described in the *July Review*. Its course during August was too far north of the Signal Corps stations to allow accurate charting. On the morning of the 1st it was central in southeastern Dakota, and by afternoon it had probably moved into Manitoba, its progress being marked by little precipitation and brisk SW. winds on Lake Michigan, a maximum velocity being reported from Milwaukee of SW. 26 miles at that time. During the 2nd it apparently moved eastward through the country north of the Lakes, during which day light rainfalls and fresh to brisk SW. and W. winds were reported from the Lake region. On the morning of the 3rd it probably passed over the Gulf of St. Lawrence to the north of the Canadian maritime stations. The lowest abnormal pressure, at a regular report, during its passage was—0.32 at Father Point, midnight of the 2nd. No signals were displayed in connection with the passage of this area.

No. II.—On the afternoon of the 3rd a barometric fall was reported from the Rocky Mountains eastward over the whole country, except a slight rise in Illinois, the Lower Lake region and St. Lawrence valley, the depression being most rapid in Kansas and Nebraska. At that time cloudy weather, with rainfall, was reported from all districts east of the Rocky Mountains, except the Northwest and Tennessee and Ohio valley, and fresh to brisk N. to W. winds prevailed in the Lower Lake region, with a maximum velocity of N. 29 miles reported from Sandusky. Brisk westerly winds also were reported from the Middle and South Atlantic States, with a maximum velocity of S. 33 miles at Barnegat. At midnight the pressure was reported as decreasing from the Northwest and Upper Lake region to the Western Gulf States. Brisk westerly winds, with cloudy weather, prevailed in the Lower Lake region, with a maximum velocity of SW. 26 miles at Sandusky, and partly cloudy weather with brisk NW. winds, were reported from the South Atlantic coast, with a maximum velocity of SW. 27 miles at Kittyhawk. The barometer continuing to fall in the Lower Missouri valley on the morning of the 4th, a well-defined depression was central in southeastern Nebraska; Omaha barometer 0.18 abnormally low. At this time the barometric fall was general east of the Rocky Mountains, except in New England, and cloudy weather, with rain, prevailed over the Lower Lake region, where the pressure had not fully recovered from the effects of low area No. I. During the 4th the pressure fell generally over the Lake region, the Mississippi valley and the Atlantic States, leaving no well-marked centre at midnight, at which time partly cloudy weather and gentle to fresh westerly winds prevailed in the Lake region, with a maximum velocity of NW. 30 miles at Escanaba, and cloudy weather, with rain, and fresh to brisk westerly winds, in the Middle Atlantic and South Atlantic States, with maxima velocities of N. 36 miles at Sandy Hook and SW. 34 miles at Cape May. On the morning of the 5th the pressure was below the normal over the whole country, except on the Gulf and South Atlantic coasts, being lowest—and still falling—over the Lake region and New England, where partly cloudy weather and fresh S. to W. winds prevailed. During this time a very low

pressure probably prevailed north of Ontario. On the morning of the 6th the reports showed for the preceding 24 hours a generally-decreasing pressure, from the Northwest to the Atlantic Ocean, accompanied by generally cloudy weather, and rain-fall in all districts, except that of the Upper Lakes. The pressure was then least in the St. Lawrence valley—Father Point barometer 0.42 inch abnormally low—where clear weather and gentle to fresh W. and SW. winds prevailed. From the afternoon of the 6th to the morning of the 7th the depression was central over the Gulf of St. Lawrence—the Sydney barometer at the last report 0.69 below the normal—while partly cloudy weather and fresh to brisk NW. winds were reported from New England and the St. Lawrence valley, none dangerous. No Signals were displayed during the passage of this area.

No. III.—This area formed from the remains of low area No. II. It was apparently central north of Lake Superior the afternoon of the 6th—Marquette barometer 0.18 abnormally low—at which report fresh to brisk southerly winds prevailed in the Upper Lake region, with partly cloudy weather. At midnight of the 6th central over the northern portion of Lake Michigan—Escanaba barometer 0.18 below the normal—it reached, with increasing depression, Lake Huron the morning of the 7th—Alpena barometer 0.23 abnormally low. Meanwhile partly cloudy weather in the Lower Lake region and rain from Ohio to New Jersey were reported. Moving southeast it was central over the western end of Lake Ontario the afternoon of the 7th, whence changing its course to the northeast—with pressure still decreasing—it reached eastern Ontario at midnight—Kingston barometer 0.32 below the normal. At that time the abnormal isobar of—0.20 embraced within its limits the Middle Atlantic States and Lower Lake region, over which districts cloudy weather and rain prevailed. In the afternoon a maximum velocity of NW. 28 miles was reported from Grand Haven. At midnight brisk NW. to SW. winds prevailed in the Lower Lake region, with maxima velocities of N. 28 miles at Port Huron and Sandusky, and brisk southerly winds on the New Jersey and North Carolina coasts, with maximum velocity of SW. 32 miles at Cape Lookout. The morning report of the 8th showed a long barometric trough extending from Maryland to Canada, central in Quebec. Cloudy weather was reported in the Middle Atlantic States and New England. Brisk northwest winds prevailed in the Lake region—maxima velocities NW. 28 miles at Port Huron and N. 28 miles at Sandusky, while brisk westerly winds, with maximum velocity of SW. 32 miles at Cape Lookout, were reported from the Atlantic coast. On the afternoon of the 8th it was central in the Lower St. Lawrence valley—Quebec barometer 0.26 below the normal—with brisk northwest winds prevailing from Michigan to New Jersey, and brisk southwest winds on the North Carolina coast. Maxima velocities of NW. 28 miles at Alpena and S. 28 miles at Cape Lookout were reported. Moving slowly northeast its position at midnight was but slightly changed. Cloudy weather, with rain and brisk variable winds, continued on the North Carolina coast, where a subsidiary depression apparently existed. Variable winds of maxima velocities of 25 and 26 miles, were reported from that coast. The morning report of the 9th showed that the centre had passed northeastward beyond the Canadian maritime stations. No signals were displayed during the passage of this area.

No IV.—The morning reports of the 10th, showed that the pressure had generally decreased from the Northwest to the Gulf of Mexico. Partly cloudy weather, with southerly winds, prevailed in the Upper Mississippi and Lower Missouri valleys, and rain was reported from Manitoba and Michigan. On the afternoon of the 10th, a slight depression was central in the valley of the Red River of the North. The midnight reports showed the pressure decreasing in the Lower Missouri and Upper Mississippi valleys, where fresh southerly winds and generally clear weather prevailed, while from the Lake region, slight precipitation was reported. The depression was then central in western Minnesota—Breckenridge barometer 0.14 abnormally low. Moving southeast very slowly and with little energy, it was central in northeastern Iowa at midnight of the 11th—La Crosse barometer 0.20 below the normal. Its progress during the 11th, was marked by fresh to brisk southerly winds, cloudy weather and light rain in the Upper Lake region and Upper Mississippi valley, with generally clear weather prevailing from the Lower Lake region to New England. Changing its course at midnight of the 11th to the northeast, and passing with increased pressure the morning of the 12th through Wisconsin, it was central that afternoon over the eastern part of Lake Superior. At that time, cloudy weather and rain prevailed over the Upper Lake region, and brisk southerly winds on Lakes Michigan and Huron, with a maximum velocity of SW. 25 miles at Milwaukee. At midnight the center had passed northeast into Canada. Cloudy weather then prevailed over the Lake region—with heavy rainfall in upper part—with brisk S. to W. winds, a maximum velocity of W. 48 miles being reported from Milwaukee. The course of the depression during the 13th, was through Canada too far north to allow its centre to be accurately located by reports yet received. During the 13th it caused in the Lower Lake region cloudy weather and rain, with brisk S. and SW. winds, maxima velocities of SW. 27 and 28 miles being reported from Oswego at afternoon and midnight, respectively. At the morning report of the 14th the centre, with decreased pressure, was in the Lower St. Lawrence valley.—Quebec and Father Point barometers 0.46 below normal. Brisk southerly winds with cloudy weather then prevailed in New England, and cloudy and rainy weather, with westerly winds, in the St. Lawrence valley. On the afternoon of the 14th it had passed over the Gulf of St. Lawrence, cloudy weather and occasional rain, with brisk westerly winds being reported from New Jersey to the Gulf of St. Lawrence, with a maximum velocity of W. 25 miles at Boston.

No. V.—The barometer fell steadily from Kansas to Texas from midnight of the 13th to midnight of the 14th, at which latter time a depression existed central in Indian Territory—Deuison barometer 0.15

below the normal. Moving east to central Arkansas the morning of the 15th, and thence northeastward, its centre was in the Tennessee valley the afternoon of the 15th, at which time cloudy weather and rain prevailed in the Atlantic States, Lower Lake region, Tennessee and Ohio valley. Brisk to high northeast winds were reported in the Lower Lake region, and brisk southeast on the Atlantic coast, with maxima velocities of E. 25 miles at Kittyhawk and NE. 40 at Sandusky. Cautionary Signals were ordered from Smithville north along the Atlantic coast to include New York, and also for all stations on Lakes Huron, Erie and Ontario. The course of the center changing to the north, at midnight of the 15th was in the Ohio valley—Louisville barometer 0.21, abnormally low. At that time the Lower Lake reports showed brisk to high northeast winds—Sandusky maximum velocity NE. 27 miles—with cloudy weather and rain, while on the New Jersey and North Carolina coasts brisk east and southeast winds, cloudy weather and rain, prevailed. Moving northeastward the depression on the morning of the 16th was central in western Pennsylvania, with slightly decreased pressure—Pittsburgh barometer 0.24 below the normal. Cloudy weather and rain generally prevailed, with brisk to high winds, northeast in Lower Lake region, easterly in New England and on Middle Atlantic coast, and southerly on North Carolina coast, with maxima velocities reported at Cape Hatteras SW. 26, Sandy Hook SE. 36, Toledo NE. 26 and Sandusky NE. 59 miles. Cautionary Signals were continued on the South and Middle Atlantic coasts, and were ordered for all New England stations. The position and conditions of this depression had changed but slightly at midnight. Cloudy weather and rain prevailed in the Lower Lake region and Atlantic States, with brisk southerly winds on the New Jersey and North Carolina coasts—maxima velocities S. 25 at Cape May, S. 28 at Cape Lookout, NE. 28 at Toledo and 26 miles at Sandusky. The signals for Lake Huron and at Toledo were then lowered, having been justified by reported velocities of 25 and 26 miles, except at Alpena. At midnight, the center being in New York, brisk southerly winds, with maxima velocities of S. 26 at Cape May and S. 28 miles at Kittyhawk were reported, with partly cloudy weather for the Middle and South Atlantic coasts, while fresh northeast winds and rainy weather generally prevailed in the Lower Lake region. On the morning of the 17th the depression, nearly stationary and central in New York, was evidently filling up, and Signals from Eastport southward along the coast, to include New York, were lowered. On the afternoon of the 17th Signals along the coast from Sandy Hook to Kittyhawk were lowered, leaving Signals displayed at Smithville, Wilmington, Macon, Cape Lookout and Cape Hatteras in advance of low area No. VII.

No. VI.—This area appeared on the Southern Pacific coast on the 15th, and moving slowly northward attained its minimum of pressure at Portland, Oregon, midnight of the 18th—barometer 0.35 below the normal. Its course cannot be accurately charted; its passage was attended by partly cloudy weather and no precipitation. The pressure increased somewhat during the 19th. At midnight of the 19th and morning of the 20th, rain was reported from Olympia, which extending southward reached Roseburg by the morning of 21st. Reports at that time showed that during the past 24 hours the barometer had fallen, ranging from 0.20 at Roseburg to 0.26 at Olympia, the latter being 0.44 below the normal. Light rain fell during the 21st from Olympia southward to San Francisco, and also in western parts of Nevada and Idaho, while the pressure steadily increased on the Pacific coast, and the center moving eastward into the Plateaux districts, was filled up during the 22d.

No. VII.—A few reports already received from the West Indies, Bahamas and vessels at sea seem to indicate the existence of this storm for some days previous to its appearance on the Atlantic coast, but are not sufficient to justify the charting of its center, as yet, further southeast than shown on chart. The paucity of reports may be, in part, attributed to the small area of the storm. The barometer fell slowly at the Florida stations during the 16th until midnight, when the pressure became stationary. Partly cloudy weather and variable winds prevailed until midnight, when a calm was reported from Havana, fresh northwest winds from Key West, and brisk north from Punta Rassa. On the morning of the 17th an abnormal barometric fall of 0.07 was reported from Jacksonville, Punta Rassa and St. Marks. The wind at St. Marks remained southwest, but at Jacksonville changed to brisk north. Clear or partly cloudy weather prevailed along the coast from South Carolina to Cuba. The afternoon (17th) report showed a stationary barometer in the South Atlantic States and Florida, except a sharp fall at the coast stations from Smithville to Jacksonville; the latter barometer 0.28 below the normal. Clear, calm weather prevailed at Havana; fresh west winds and partly cloudy weather at Key West and Punta Rassa; fresh northwest winds and partly cloudy weather, with a light rain-fall, at St. Marks; gentle northeast and east winds, partly cloudy weather, from Charleston to Jacksonville, with moderate rain-fall at Charleston and Savannah. A very heavy local rain of 1.45 inches; with a northeast wind, was reported from 2:23 to 5:30 p. m. at Gulf Hammock, western coast of Florida. The depression was then probably central some 200 miles east of the central Florida coast. The Cautionary Signals displayed in connection with area No. V were ordered down except from Cape Hatteras south to include Smithville, which remained displayed for this depression. During the day at Cape Lookout "a tremendous southeast sea-swell broke on the beach all day, with an unusually high tide in the afternoon." At Savannah heavy rain fell from 11:25 a. m. to 6 p. m., with southeasterly wind backing to northwest during the afternoon. At 7:50 p. m. the gale commenced at Cape Lookout with a heavy southeast rain-squall, which lasted until 10:05 p. m. At 10 p. m. the gale commenced at Macon. The schooner "Abbie J. Bentley," which passed Hatteras at 8 p. m., going north, experienced fresh breezes at midnight, which obliged light sails to be furled. At midnight of the 17th, the reports showed a stationary or rising barometer over the whole country east of the Mississippi river, except in Georgia, South Carolina and the southern

part of North Carolina, with the greatest abnormal fall of 0.17 at Charleston, (barometer 0.35 below the normal.) Brisk to high southeast winds and cloudy weather prevailed from Cape Hatteras to Cape Lookout, brisk east and northeast winds from Smithville to Charleston, with heavy rain and a brisk northwest wind at Savannah. Clear weather, with gentle northeast winds, prevailed over Florida and the interior of Georgia. High winds were reported on the Carolina coast ranging from NE. 25 at Charleston to SE. 32 miles at Cape Lookout. The storm-centre was then off the South Carolina coast. Cautionary Signals were then ordered at Cape Henry and Kittyhawk. The gale after midnight increased at Smithville, the wind backing to northeast, with heavy rain and rapidly falling barometer. Between 3 and 4 a. m., (18th,) the wind backed to northwest with increasing force, and at the same time (3:15 a. m.), the gale commenced at Wilmington. At 4 a. m. at Cape Henry the wind, which had been southwest, died away to a calm, and rain commenced, followed immediately by light north and northeast winds. At 5 a. m. the wind reached its greatest velocity, 37 miles NW. at Smithville, and at 5 a. m. at Wilmington W. 68 miles. At that time (5 a. m., 18th, at Cape Lookout, the wind had increased to SE. 80 miles, the rain fell in torrents and a fearful sea swept away the stable and outbuildings. Schooner "Seychelle" came ashore as wind veered to southwest, and although drawing twelve feet was carried, a total wreck, above the highest tide mark, over ground never remembered to have been overflowed before. After 5 a. m. the wind and rain abated at Smithville, with 2.10 inches rainfall in preceding ten hours. At 6:30 a. m. (18th) at Macon, the anemometer registered 80 miles and then the electrical connections failed. At 6:30 a. m. the barometer at Cape Lookout, which, at 6 a. m., was 29.22 had fallen to 29.15, and the anemometer cups were blown away, the wind then blowing at the rate of 138 miles per hour. The barometer remained at 29.15 till 7 a. m., the wind and sea still increasing. By 7:30 a. m. the barometer had risen to 29.18 with wind at its greatest force—an estimated velocity of SW. 165 miles. At Portsmouth, N. C., the wind at 6:30 a. m. had attained a velocity of SE. 49 miles. The 7.35 a. m. reports showed the cyclone central inland of the North Carolina coast stations, lowest pressure, Cape Lookout, 29.24,—0.75 below the normal and a gradient of 0.30 between that station and Cape Hatteras. Signals were ordered from Norfolk north along the coast to include Boston. Heavy rains had set in about 2 a. m. at Cape May, at which station the barometer at this report was 0.18 below the normal. At 8.45 a. m. the wind at Portsmouth, N. C. was SE. 97 miles when the recording apparatus became temporarily disabled. At Macon the wind veered to SW. at 8 a. m. 18th and the tide rose four feet above the ordinary high tide. At 8.30 a. m. the wind reached its maximum recorded velocity at Cape Hatteras, SE. 74, when the cups were blown away, and at Kittyhawk at 9:50 a. m., SE. 100 miles. The gale continued at Wilmington until 10 a. m., with a total rain-fall of 4.60 in 6½ hours. At Norfolk, at 10:45 a. m., the barometer had fallen in preceding hour from 29.58 with NE. 24 miles to 29.16 NE. 48. At 10 a. m. (18th) schooner "A. J. Bentley," latitude 37° 26' N., 74° 2' W., which had been compelled at 8 a. m., to close-reef sails, experienced brisk, southeast winds, which increased rapidly in force, at 11 a. m. blowing a southeast hurricane, which carried away jib and obliged her to take in nearly all sail. At noon the wind was hardest ever experienced, rain very heavy and waves estimated at 40 feet from trough to crest. At 2:20 p. m., (barometer compared with Signal Service at New London and found to be an excellent instrument) read 29:20. Hurricane increased to 3 p. m., when it carried away main-sail and obliged her to scud under bare poles. Wind blew violently until 4:30 p. m., when it settled down to severe gale, little north of west, until 8 p. m. At 11 a. m., the wind at Cape Henry had reached a velocity of N. 66 miles, when it moderated for a short time to 35 miles, and shifted to northwest, blowing with hurricane violence 70 miles at 11:30 a. m. At 11:15 a. m. (probably the time the wind lulled at Cape Henry) the Norfolk barometer reached 29.12, lowest point, and the wind fell to NE. 39. The barometer had risen at 11:30 a. m. and 11:45 a. m. to 29.13 (NE. 34) and 29.20 at which latter time the wind changed to north and attained its maximum velocity, 72 miles. During this half hour the greatest part of the damage, at Norfolk and its vicinity, was done. At 12:30 p. m. the rising mercury reached 29.42 while the wind backed to NW. 60. At the same hour (12:30 p. m., 18th) at Cape Henry the wind had reached a velocity of NW. 76 when the anemometer cups were carried away. The wind increased steadily, and about 2 p. m. attained its greatest velocity—estimated at NW. 100. At Johnstontown, eastern shore, Virginia, about 35 miles north of Cape Henry, the barometer was at its minimum between 12:30 and 1:30 p. m. The wind on that day (18th) was heavy NE. until noon and then "shifted" to NW. with heavy gusts. Thirty panes of glass were blown from the observer's house *outward against* the wind's direction. The bark "Eliza J. McManeny" at noon (18th) 45 miles southeast of Five Fathom Bank lightship, reported barometer, early in the day, falling very rapidly, with SE. wind and rain in torrents. At 2 p. m. the wind ceased blowing from the SE. leaving a terrific sea, and suddenly the wind came out of the NW. and blew "a perfect cyclone" for two hours. At Atlantic City the maximum recorded velocity NE. 60 miles was at 3 p. m., after which time the flooded battery failed to record, and at Barnegat N. 64 miles about 5 p. m., at which time 5.39 inches rain-fall had fallen in nine hours. The U. S. S. Wachusett reports that 4 a. m. (18th) off Virginia Capes, barometer stood 30.04. SSE. wind, force 2, and squally weather and moderate swell; 8 a. m. barometer 30.03, 10 a. m. 30.01 weather unchanged. At noon position 38° 45' N. 73° 51' W., wind E. force 6, ship heading NNE. At 2 p. m. headed E. by N., barometer 29.71; E. wind, force 9, sails furled. At 4 p. m. barometer 29.46, wind SE., force 10. At the afternoon report of the 18th, (4:35 p. m.) the pressure was central about one hundred miles east of Barnegat. At that time Cautionary Signals were ordered up at Portland and Eastport. The signals displayed at Baltimore and on the North Carolina coast, from Smithville to Cape Lookout inclusive, and at Kittyhawk, were lowered. From Lewes northward along the Atlantic coast, to include New York, the Cautionary

Signals were changed to Off-shore. At 4 p. m. the wind, which had been increasing steadily at Cape May during the day, attained a velocity of N. 60 miles and shortly after the wind backed to west, and the rain—which had commenced at 2 a. m. (18th) ceased—total amount 8.46 inches. At this report, New England, where heavy rains, east and northeast winds had prevailed for preceding day in connection with the remains of low area No. V, felt the influence of the advancing depression as far north as to include the greater part of Massachusetts. The storm commenced at New Haven about noon, soon increasing to a severe northeast gale which soon backed to N, and at 9:20 p. m. blew 33 miles. Rain-fall in 15 hours 4:15 inches. At New London a sharp barometric fall since noon was shown by the 2 p. m. report, when a heavy rain-storm set in with heavy gusts from the N. and NW.—the heaviest from the N.—attaining a velocity of 37 miles about midnight. At Sandy Hook the minimum barometer and highest wind occurred at 9 p. m. (18th) 29.59, NW. 52 miles. At New York City, however, the maximum velocity was but NE., 24 miles during p. m. 18th. At 5:30 p. m. the U. S. S. Wachusett, about 39° N., 73° 30' W., reported the barometer fallen to 29.15—a fall of 0.86 inch in seven and one-half hours—wind SE. by E., force 11. Then fell a calm with confused, heavy seas. At 5:45 p. m. light airs from NNW., and then a hurricane from NW., until 10 p. m. At 6 p. m. barometer 29.32 (a rise of 0.17 in 30 minutes,) NW. wind, force 11. At 8 p. m. barometer 29.52, wind-force 12. At midnight wind moderated, W. by N., force 7, barometer 30.08, a rise of 0.93 inch in six and one-half hours. The U. S. S. Constellation left Newport 2 p. m., August 18th, barometer at noon 30.02, slowly falling to 29.96 at 3 p. m. Rounded Point Judith, 4 p. m. barometer 29.90 and at 5 p. m. 29.80 with very heavy rain and NE. squalls; shortened sail. Shortened sail still further between 6 and 7 p. m., wind increasing, barometer 6 p. m. 29.75, 7 p. m. 29.63. Could not see Red Flash Race Light although less than a mile distant. Wind increased to whole gale, backing slowly, and barometer fell rapidly—at 8 p. m. 29.43 and 9 p. m. 29.32. Between 8 p. m. and midnight obliged to take in all but storm sails, send down yards and bend sheet cables. 9 p. m. barometer 29.30 and 10 p. m. 29.25, 10.15 p. m. 29.23 (lowest point,) 11 p. m. 29.27, midnight 29.35, (rain ceased) 1 p. m. (19th) 29.48, 1:30 p. m. 29.50, at which time wind moderated very much, 2:30 a. m. 29.61. At 10 p. m. the Bark Glint, 20 miles SSW. of Fire Island, had a hurricane from ESE. to NNW., lasting an hour-and-a-half. At the midnight report 18th the storm was central just east of Long Island. The signals then displayed from New Haven, at all coast stations east and north to include Portland, were then changed to Off-Shore Signals. At 11 p. m. the steamer John Hopkins about 25 miles off Chincoteague had heavy southeast winds with tremendous seas; the wind changed suddenly to northwest and the rain fell in torrents. The storm commenced from New Bedford, Mass., to Portsmouth, N. H. at about 8 p. m. At that time the barometer at New Bedford stood at 29.48 with a strong E. by S. wind, which increased to a gale by 10:30 p. m. At midnight a calm, probably at the center of the depression; at 12:20 a. m. 19th, the barometer had reached its minimum 29.05. The wind then recommenced with great violence (direction not given but probably NW.) and attained its maximum force between 2 and 3 a. m. At 5 a. m. (19th) the barometer had risen to 29.62, and a strong W. by S. wind prevailed. At Newport the storm commenced about 8:30 p. m.; the wind attained by 11 p. m. a velocity of 26 miles N. E. At 11:23 p. m. (18th) the center was probably very near the station, the barometer standing at 29.11—a fall of 0.72 in. in the preceding 6 hours and 25 minutes—and the wind lulled to six miles per hour. At midnight the wind shifted to violent northwest, attaining a velocity of 44 miles at 2 a. m., and the barometer rose with a rapidity equal to its fall, showing 8½ hours later a rise of 0.71 inch. At Wood's Holl the storm which began at 8:15 p. m., reached its height at 2:30 a. m. 19th, when the wind blew at the rate of 56 miles from the northwest. The midnight report showed a barometric fall of 0.78 in. in 6½ hours. At Boston the gale which had commenced at about 6 p. m. was extremely severe; the wind attained its highest velocity NE. 44, at 11:30 p. m. At Thatcher's Island, commencing at 8 p. m., the storm was at its height at 3:40 a. m. (19th), the wind blowing 54 miles NE. The barometric fall at midnight report of 18th was 0.42 inches in preceding 6½ hours. At Highland Light, Cape Cod, the gale continued from 5 p. m. 18th, until 10 a. m. 19th, being the severest for years. The wind attained a velocity of 40 miles. At Newburyport, Mass., the storm commenced about 8 p. m. and from 9 to 12 p. m. (18th) a veritable hurricane was reported to have prevailed. The barometer at 10 p. m. (local time) was 29.62 showing a fall of 0.43 inch in preceding 7 hours. The barometer must have been much lower during the night as at 6 a. m. (19th) it stood at 29.55. At Portsmouth, N. H., commencing at 8 p. m., 18th, the gale lasted only until 3 a. m., 19th, the wind attaining its maximum velocity NE. 50 miles, at midnight. The 7.35 a. m. report of the 19th showed the cyclone central a short distance south of Eastport, at which station heavy rain, barometer 29.30—0.70 below the normal, and wind E. 54 miles were reported, while at the remaining New England and the Middle Atlantic stations brisk to high NW. winds and clear or clearing weather prevailed. Signals were ordered down from New York eastward and northward to include Boston, and also at Cape Hatteras. The Signal at Eastport was changed to Off-shore. At Portland, Me., a heavy rain had commenced and a northwest gale sprung up early in the morning. At 7 a. m. (local time) the barometer stood at 29.53, a fall of 0.48 inch, in 17 hours, with a NW. wind of 20 miles, and a rain-fall of 2.03 inch in 15 hours. At 8 a. m. (morning report of 19th) the barometer had risen to 29.55 with wind NW. 24 miles. The maximum wind velocity NW. 42 miles occurred at 4 a. m., 19th. At Eastport the barometer continued to fall, standing at 10.30 a. m. (19th), 29.20 NE. 34 miles; at 11 and 11.15 a. m. 29.16 (lowest) NE. 34 and 32 miles; 12 m. 29.19 N. 21; 1 p. m. 29.29 NW. 34; 2 p. m. 29.37 NW. 26; 3 p. m. 29.45 NW. 27; at 5.15 p. m. (afternoon observation) 29.56 NW. 36. Heavy rain prevailed until 12.30 p. m. and then light rain until 4.30 p. m. The barometer at 11.15 a. m. had fallen 0.95 inch in 27 hours. At the afternoon report 19th, the storm had passed into New Brunswick—

Halifax barometer 0.42 below the normal. Signals were lowered from Lewes northward to include all displayed, except at Eastport, which were lowered at midnight. By midnight of the 19th the storm was probably central over St. Lawrence bay, moving northeast.

This storm is especially interesting on account of the rapid and extreme fluctuations of pressure and the attending phenomena near the immediate center. The following tabulated statement shows the most marked phenomena attendant on its passage as compiled from reports now at hand :

PLACE.	BAROMETER.				WIND.				Time of occurrence of central calm - 18th.	TOTAL RAIN-FALL.	
	Lowest reading.	Fall.		Rise.		In Front of Storm.		In Rear of Storm.			
		in.	h. m.	in.	h. m.	direction.	max. vel.	direction.			max. vel.
Macon.....	—	—	—	—	—	—	—	—	—	—	
Lookout.....	29.17	0.73	8.00	0.72	7.00	SE.	*100	—	—	—	
Norfolk.....	29.12	0.56	4.15	0.75	5.15	SE.	*138	SW.	*165	4.29	
Cape Henry.....	29.05	0.68	4.30	0.80	4.30	NE.	48	NW.	60	6.03	
Cape May.....	29.51	0.41	6.30	0.40	9.00	N.	65	NW.	100	4.62	
Schr. H. A. Bentley, 38° N. 74° W.....	—	—	—	—	—	N.	64	NW.	60	8.46	
U. S. S. Wachusett, 39° N. 74° W.....	29.20	—	—	—	—	SE.	*90	—	—	3 p. m.	
U. S. S. Constellation	29.15	0.85	5.30	0.93	6.30	SE. by E.	†75	NNW.	†90	5:45 p. m.	
Newport.....	29.33	0.79	10.15	0.38	4.15	—	†65	—	—	Torrents.	
New Bedford.....	29.11	0.72	6.25	0.71	8.30	N.	26	NW.	44	11:23 p. m.	
Wood's Holl.....	29.03	0.84	10.20	0.57	4.40	E. by S.	*50	NW.	*50	Midnight.	
Eastport.....	29.08	0.78	6.30	0.70	8.38	ESE.	40	NW.	56	—	
	29.16	0.95	27.00	0.67	12.30	E.	56	N.	38	—	

\* Estimated. † Converted from a scale of 0 to 12.

The amount of damage done by this storm, can not be enumerated in detail within the limits of this Review. The injury to inland property over sections traversed by the immediate center was very extensive. Fortunately this damage was confined to the track of the storm-center itself, and consequently, is quite limited. The damage to maritime property must have been enormous, reports already at hand, show that over one hundred large vessels were shipwrecked or suffered serious injury, while the number of yachts and smaller vessels which were destroyed or seriously damaged, must certainly exceed two hundred.

No. VIII.—During the 20th the barometer fell steadily in the Northwest, and at midnight a depression was central in western Dakota, at which time Bismarck reported barometer 0.19, abnormally low, and a heavy local rain-fall. On the morning of the 21st the area was central, with decreased pressure, in eastern Dakota—Breckenridge barometer 0.35 below the normal. Cloudy weather and occasional rain, with fresh to brisk southerly winds, then prevailed over the Upper Lake region. By that afternoon it had moved southeast into Minnesota, with no change of pressure, when partly cloudy weather, occasional rains and brisk southerly winds were reported from the Upper Lake region, with maxima velocities of SW. 26 miles at Milwaukee and S. 25 at Grand Haven. Moving slowly east through Wisconsin the night of the 21st it was central, with decreased pressure, over Lake Michigan the morning of the 22nd—Escanaba barometer 0.42 below the normal. At that time rain and partly cloudy weather were reported from the Upper Lake region, clear or partly cloudy weather from the Lower Lake region, cloudy weather and rain from New England and St. Lawrence valley, and brisk southwest winds from Wisconsin to New England—maximum velocity S. W. 28 miles at Milwaukee. The area was central that afternoon over Lake Huron; brisk southerly winds still continuing from the Lower Lake region to New England, with maxima velocities of S. W. 28 miles at Sandusky, 27 at Cleveland and 34 at Milwaukee; there was but little precipitation reported save in St. Lawrence valley. Moving northeast the center reached the St. Lawrence valley at midnight—Montreal barometer 0.54 below the normal. Generally clear weather prevailed from the Lower Lake region to New England, with brisk S. W. winds in the Middle Atlantic States and New England, and maxima velocities reported of S. 27 miles at Cape May and W. 32 at Port Huron. The center moving northeastward, the morning of the 23rd was in the lower St. Lawrence valley with decreased pressure—Father Point barometer being 0.63 below the normal. Brisk southwest winds prevailed from Middle Atlantic States to New Brunswick, with partly cloudy weather. By afternoon the center was over the Gulf of St. Lawrence. No signals were displayed during the passage of this area.

No. IX.—During the 20th and 21st a low pressure prevailed over the Gulf of Mexico, and on these days brisk easterly winds, cloudy weather and occasional rain, were reported along the Gulf Coasts. At midnight of the 21st Cautionary Signals were ordered at Mobile, Port Eads, New Orleans and Galveston. On the morning of the 22nd the abnormal isobar of  $-0.20$  inch included Louisiana and the greater part of Texas—Galveston barometer 0.31 below the normal. Brisk east to north winds prevailed from St. Marks to Galveston along the Gulf coast, with cloudy weather and occasional rain. Cautionary Signals were then ordered for Indianola. During the day the barometer fell rapidly over the whole Gulf region, and at the afternoon report cloudy weather and rain generally prevailed, with brisk southeast winds from Key West to New Orleans, and brisk northwest winds on the Texas coast, with maxima velocities of NW. 27 miles at Indianola, NW. 38 at Galveston and SW. 36 at New Orleans. The depression was then central in the northwest part of the Gulf of Mexico—Galveston barometer 0.48 below the normal. Very heavy rainfalls of 1.55 at New Orleans and 2.27 inches at Mobile in past 8 hours.

were reported. The barometer continued to fall at Galveston until 7 p. m. of the 22nd then reading 29.34 or 0.55 abnormally low. At midnight of the 22d the course of the depression having changed from northwest to north, it was central in eastern Texas, northeast of Galveston, at which station the barometer was 0.48 below the normal. Cloudy weather and rain prevailed in the Gulf States, with brisk easterly winds, except in southern Texas, where northerly winds, with maxima velocities of N. 28 miles at Indianola and W. 36 at Galveston were reported. Moving slowly north with decreasing pressure the area was yet central in eastern Texas the morning of the 23rd—Shreveport barometer 0.73 below the normal. Cloudy weather, with rain and brisk southeast winds, were reported from the East Gulf States, with a maximum velocity of SE. 30 miles at Mobile; partly cloudy weather, with north to west winds, in Texas, and cloudy, rainy weather, with heavy rain-falls, in Tennessee. Signals were then lowered at Galveston and Indianola, having been justified by velocities of NW. 28 miles at Indianola, and NW. 38 at Galveston. By afternoon of the 23rd the center, moving slowly with increasing pressure, had reached southern Arkansas—Shreveport barometer 0.60 abnormally low. Cloudy weather, with southerly winds, generally prevailed east of the Mississippi river and south of the Lake region. Cautionary Signals were then lowered at Port Eads, New Orleans and Mobile, having been fully justified by velocities of SE. 30 miles at Mobile and SE. 40 at New Orleans. Moving slowly NNE. the depression at midnight was in central Arkansas, with existing conditions slightly changed, except in the Lower Lake region, where the winds changed from SW. to NE. On the morning of the 24th the center was in northeastern Arkansas—Cairo barometer 0.56 below the normal. Cloudy weather, with generally light rain-fall and southerly winds, were reported from the Atlantic and Gulf States, and cloudy weather, with brisk northwest winds, in the Lower Lake region—maxima velocities NE. 25 miles at Toledo and NE. 29 at Sandusky. Cautionary Signals were ordered for all stations on the New Jersey coast and in the Lake region, except Duluth, Marquette, and Escanaba. The center, the afternoon of the 14th, reached western Kentucky. Brisk southwest winds, cloudy weather and occasional rain were reported from the Atlantic States; partly cloudy weather and brisk northeast winds from the Lake region, and northerly winds, cloudy weather and rain from the Ohio valley. At midnight the area was central in the Ohio valley—with considerably increased pressure, Cincinnati barometer 0.45 below the normal, with existing conditions but slightly changed. Maxima velocities of N.E. 25 miles at Toledo and N.E. 26 at Sandusky were reported. The course of the depression having changed to the east, the centre, with still increasing pressure, was in West Virginia the morning of the 25th. Brisk northeast winds, with cloudy weather and rain then prevailed in the Lower Lake region and New England and along the New Jersey coast. Maxima velocities of N. 28 miles at Toledo and N. E. 39 at Sandusky, were reported. Signals were then lowered at Lake Michigan stations, not justified. During the day the course of the depression was S. of E., and in the afternoon it was central in Virginia—Washington barometer 0.37 abnormally low. Brisk northeast winds, with cloudy weather and rain, prevailed on the New Jersey coast, and brisk to high southwest winds, with partly cloudy weather, on the North Carolina coast; cloudy weather and brisk northerly winds in the Lower Lake region. Maxima velocities from the Lake region of N. 26 miles at Milwaukee, N. 35 at Sandusky, were reported, and several instances on the Middle and South Atlantic coasts ranging from NE. 26 miles at Barnegat to SW. 36 at Cape Lookout. Cautionary Signals were ordered at New York, and from Lewes southward to include Cape Lookout. At midnight the centre was near the Virginia Capes, with existing conditions attendant on the depression substantially unchanged. The winds on the coast from Sandy Hook to Smithville, with unchanged direction, had increased in violence, except at Cape Henry, which was near the center. Actual velocities along the coast ranged from 23 miles at Kittyhawk to 36 at Cape Lookout and the maxima velocities were generally somewhat higher. Maxima velocities of N. 26 miles at Toledo and N. 29 at Sandusky, were reported from Lake Erie. All Signals remaining in the Lake region were then lowered, having been justified at all stations, except at Buffalo and Port Huron, the wind at the latter place, however, attaining a velocity of 24 miles. On the morning of the 26th, the central depression had passed eastward over the Atlantic ocean. Cloudy or rainy weather, however, generally prevailed on the Atlantic coast, with brisk to high winds, NE. from Boston to Cape May, and from NW. to SW. on the North Carolina coast. All stations on the New Jersey coast reported maxima velocities ranging from 28 to 36 miles; Cape Hatteras SW. 30 and Cape Lookout W. 36. Cautionary Signals were ordered from New Haven eastward and northward to include Boston. During the afternoon the pressure increased rapidly from North Carolina to New England, with cloudy weather and rain. The winds changed on the North Carolina coast to northwest and decreased in violence, but on the New Jersey coast remained brisk to high—from 24 to 40 miles—and Boston reported a maximum velocity of NE. 26 miles. At midnight all signals from Boston southward along the coast, to include Norfolk, were lowered,—North Carolina reports missing. The signal at Cape Henry was not lowered until the afternoon of the 27th. All signals from Boston southward to include Norfolk and Cape Henry were fully justified by velocities ranging from NE. 26 miles at Boston to E. and NE. 40 at Lewes, Atlantic City and Barnegat. The low pressure on the North Carolina coast recovered itself slowly during the 27th and 28th, during which reports were missing from a part of the coast stations. Subsequent reports showed that brisk to high winds prevailed from the morning of the 27th to the afternoon of the 28th from Kittyhawk to Cape Lookout. The Signals at these stations were lowered on the afternoon of the 28th, having been fully justified by velocities of NE. 28 miles at Cape Lookout, NE. 30 at Cape Hatteras and NE. 36 at Kittyhawk.

No. X.—An area of low barometric pressure appeared on the Oregon and northern California coasts during the 25th, and on the morning of the 26th Olympia reported a barometer 0.25 below the normal, with light rain. During the 26th and 27th cloudy weather, with light rain-falls, prevailed in Oregon and north

ern California with an abnormal pressure of about  $-0.20$  covering Oregon. On the 27th the barometer fell generally from Idaho to Minnesota, and at midnight the lowest pressure was at Virginia City. On the morning of the 28th the abnormal isobar of  $-0.20$  included Utah, northern Wyoming and part of Dakota, with the lowest pressure at Salt Lake City,  $0.34$  below the normal. During the day occasional light rains were reported in Montana and northwestern Dakota, and at midnight the barometer was lowest,  $0.42$  below the normal at Bismarck, with a well-defined centre in western Dakota. During the 29th, it moved northeastward into Manitoba, its passage marked by light rain in the Northwest, and by isolated cases of brisk, variable winds on Lakes Superior and Michigan. Cautionary Signals were displayed at Marquette on the morning and at Duluth and Escanaba on the afternoon of the 28th, and were lowered the morning of the 30th, having been fully justified at Duluth by a maximum velocity of NE. 32 miles.

No. XI.—The low pressure in the Gulf, consequent on area No. IX, recovered very slowly after the passage of that area, and on the morning of the 26th was nearly normal in the Western Gulf States. On that afternoon a slight general fall occurred from Arizona to Alabama, which continuing till the afternoon of the 27th, reduced the pressure in the Gulf to about  $0.20$  below the normal—Punta Rassa and St. Marks  $0.21$  below the normal and Indianola  $0.17$  below the normal. The pressure remained substantially unchanged until the afternoon of the 28th, when brisk easterly winds prevailed from Indianola eastward to St. Marks, and gentle south winds with cloudy weather and rain at Punta Rassa and Key West. At midnight the pressure had risen very slightly at the Gulf stations but the winds on the Texas coast changed to brisk northeasterly, and at Indianola attained a maximum velocity of NE. 33 miles. The pressure slowly declined at the morning and afternoon reports of the 29th, but rose slightly at midnight; partly cloudy weather and brisk northeast winds generally prevailed during the day with a maximum velocity of E. 32 miles at Indianola. During the 30th brisk northeast winds with cloudy weather and occasional rain prevailed from St. Marks to Indianola, while the barometer generally and slowly fell. On the morning of the 31st the fall continued, New Orleans reporting barometer  $0.21$  below the normal and brisk north and east winds prevailed from St. Marks to Brownsville with rain from New Orleans to Havana. Signals were ordered for Port Eads, Mobile, New Orleans, Galveston and Indianola. The fall continued steadily during the day. At midnight the New Orleans barometer was  $0.29$  below the normal; winds of 31 miles N. at Indianola, 28 N. at Galveston and 24 E. at New Orleans had been reported during the day. At midnight signals were yet flying, having been fully justified, except possibly at Mobile. A special report of the wind at Port Eads covering seventy-one hours, ending 10 a. m. of the 31st, gives the mean velocity during that time as  $28\frac{1}{2}$  miles per hour, attaining a maximum of 35 miles ENE. at 7 a. m. and NE. 35 at 9 a. m. of the 30th. The wind blew steadily from ENE. from 11 a. m. of the 28th till 10 a. m. of the 30th, and for the succeeding 24 hours from the NE. Such steadiness of velocity and direction had never before been known at that point.

## INTERNATIONAL METEOROLOGY.

On Chart No. IV. are shown the probable tracks of storm-centres over the oceans, deduced from data received at this office up to August 5th, 1879, and in the upper right-hand corner will be found an index to the same. Below is a brief notice of the above, and also of some storms over the Southern Hemisphere:

*North Atlantic Ocean.*—No. I. is a continuation of the secondary depression attending area of low barometer No. II. of the *June Review*; on the 8th and 9th of June it was central to the north of Newfoundland, and on the 10th probably passed to the north-northeast inducing the S. and SW. winds and rain reported on that day in  $50^{\circ}$  N.  $41^{\circ}$  W. No. II. probably originated on this day (the 10th) in the southern quadrant of the preceding depression or about  $40^{\circ}$  N.  $50^{\circ}$  W. and is the extended track of storm No. V. given on Chart No. VII of the *July Review*. On the 11th, its centre was apparently indicated in about lat.  $45^{\circ}$  N  $43^{\circ}$  W; on and after the 12th, its track was about as previously shown, although reports since received, change the position for the 12th and 13th a little towards the south. No. III probably originated in about  $45^{\circ}$  N.  $15^{\circ}$  W. on June 10th, in the south quadrant of No. II *July Review*, although as the reports from the Azores are not yet to hand, this may be considered somewhat doubtful. No. IV was central on June 30th, about  $53^{\circ}$  N  $20^{\circ}$  W, having probably developed in the south-west quadrant of area No. VI, *July Review*; it passed over the British Isles on the 1st and 2nd of July, during which days north-westerly gales and high seas were experienced from  $20^{\circ}$  to  $30^{\circ}$  W and about  $50^{\circ}$  N. No. V is a continuation of area of Low Barometer, No. I chart, No I, described in the *July Review*; on the 4th, it passed south of Newfoundland, and on the 5th, was probably joined by No. VI from Labrador; on the 5th, the centre was probably more to the north than indicated, but high seas were reported from  $30^{\circ}$  to  $50^{\circ}$  W and between  $44^{\circ}$  and  $50^{\circ}$  N; 6th and 7th, "terrific" westerly gales and high seas were reported between  $20^{\circ}$  and  $30^{\circ}$  N and  $50^{\circ}$  to  $55^{\circ}$  W; S. S. Leipzig, on the 7th, in  $50^{\circ}$  N  $16^{\circ}$  W, and on the 8th, in  $50^{\circ}$  N  $18^{\circ}$  30' W, reports, "7th and 8th, had very heavy gales, with rain, from south-west to west and north-west, and high rough seas." No. VII is a continuation of area of Low Barometer, No. II, (chart No. I.) of *July Review*; on the morning of the 10th, it was central near Cape Breton, and on the morning of the 11th south of Newfoundland; southerly gales and high seas were reported off the banks of Newfoundland, in advance of the center of depression, which, as it moved eastward, was followed, on the 11th, by dense fogs; at 8 p. m., S. S. Virginia, was wrecked on Sable Island; 12th and 13th, it was north-east of Newfoundland, and on the 14th and 15th, developed into a quite severe storm about  $50^{\circ}$  N  $30^{\circ}$  W; on the 16th it passed south of Ireland, and on the 17th, was dissipated over Western Europe. No. VIII is a continuation of area of Low Barometer, No. VI, (chart I) *July Review*, and was north of Newfoundland on the 25th, but after this