

6.—This depression is given an approximate path north of the West Indies from the 16th to 19th, during which period it possessed moderate energy. On the 19th the storm-centre was central in about N. 30°, W. 75', whence it recurved northward, and on the morning of the 21st was located in about N. 36°, W. 72'. During this date the depression apparently moved northward and united with an area of low pressure which occupied the Saint Lawrence valley. Reports indicate that the disturbances attending this depression were not severe in their character, save on the 21st, when gales of hurricane force were reported. The lowest barometric pressure, about 29.60 (752), was also noted on the 21st.

VII.—This is the only well-marked tropical storm observed during the month; while the reports from land stations do not indicate the existence of this storm before the 17th, the marine reports show that a storm was central in the east Gulf, to the west of Cuba, on the 15th and 16th. By the morning of the 17th it had reached the west Florida coast, attended by heavy rains and high easterly winds. It passed to the northeast over northern Florida during the 17th, causing a maximum wind of forty-three miles per hour at Cedar Keys, and a wind of thirty-four miles per hour at Jupiter. It continued its northeast course during the 18th along the south Atlantic coast, attended by severe gales, the wind at Charleston reaching thirty-four miles from the east. On the 19th it was apparently central to the east of the middle Atlantic coast, causing a wind of thirty-six miles from the east to northeast at Block Island. During the 19th it continued its northeasterly course, and it is probable that it united with low area number vi after that disturbance reached the lower Saint Lawrence valley.

4.—This depression

8.—This depression apparently originated off the Florida or south Atlantic coasts, and reports admit of locating its centre in about N. 33°, W. 74° on the 25th. By the 26th the storm-centre had moved northeast to the thirty-fifth parallel, and by the 27th had advanced to about the thirty-seventh parallel; after which its location cannot be determined, and it is thought that the depression dissipated on the west edge of an area of high pressure which occupied the ocean to the eastward. A noteworthy feature of this storm was the unusual strength of the gales attending a relatively slight barometric depression. The barometer readings reported near the storm-centre did not fall below 29.90 (759) from the 25th to 28th, inclusive, while after the 25th strong to whole gales, attaining hurricane force on the 27th and 28th, were reported west of the seventieth meridian and between the thirty-fifth and fortieth parallels.

The following telegraphic reports from the Rev. Father Benito Vines, S. J., Director of the Meteorological Observatory of the Royal College of Belen, Havana, Cuba, indicate the meteorological conditions which prevailed at stations in San Domingo, Cuba, and over the east Gulf for several days preceding the appearance of this depression north of the Bahamas. From the 19th to the 22d, inclusive, the barometer at San Domingo was low and falling, a reading of 29.41 (747) being reported on the 22d, after which there was a slight increase in pressure until the 23d, the date of the last report. During this period the wind apparently continued between south and southeast. The reports of the 23d from Santa Clara and Santiago de Cuba indicated the presence of a cyclonic depression south of Cuba, and the observations at Havana of the 23d and 24th showed the presence of a disturbance over the Gulf:

Santiago de Cuba, August 19th, 5.30 p. m.: observations from San Domingo, 5 p. m., barometer 29.57 (751), wind se., strong, cloudy, calm sea. At present, in Havana, there are only observed indications of an anti-cyclone in the first quadrant. Santiago de Cuba, August 20th: observations from San Domingo, 4 p. m. to-day, barometer 29.53 (750), wind s., storm. Santiago de Cuba, August 21, 4 p. m.: observations from San Domingo, 3 p. m., barometer 29.45 (748), wind s., storm. Puerto Plata the same. Havana, August 22d: the latest telegrams received from San Domingo and Puerto Plata apparently indicate that the storm has crossed over the central portion of the island of San Domingo in a northwest direction. In Havana, at present, the lower currents have continued to be apparently anti-cyclonic, moderating in intensity and causing a fall of the barometer, whilst the upper currents indicate a

cyclonic disturbance from the direction of the Gulf. From the east there is nothing upon which to found a probability, and this apparently indicates that the storm referred to by the telegrams is of moderate dimensions, and is still at a great distance. San Domingo, 22d, 5 p. m.: barometer 29.41 (747), wind se., severe storm, sea agitated. San Domingo, 23d, 5 p. m.: barometer 29.45 (748), wind se., light storm, sea calm. Santa Clara, 23d, 6 p. m.: barometer 29.49 (749); during the day cloudy sky, rain at times from ese., and wind very light, variable in the second quadrant, shifting now to ene., complete calm, and plumiform cirrus in small numbers. Havana, 23d, noon: the barometer has continued to fall and the wind has shifted to s. The cyclonic disturbance from the Gulf, which until the present time appeared to be of moderate intensity, has increased somewhat in strength, controlling the lower currents. No indications of a cyclone are observed from the east. Santiago de Cuba, 23d, 3 p. m.: barometer 29.88 (759), barometer this morning 29.98 (762), cloudy, thunder-claps, cloudy to the south. Depression appears to continue sw. or w.  $\frac{1}{2}$  nw. Santiago de Cuba, 24th, 7 a. m.: barometer 29.98 (762), cumulo-stratus from se., cirro-cumulus from s., calm, misty; 3 p. m., barometer 29.93 (760), cumulo-stratus from the s., cirrus from the west, wind s., good weather. Havana, 24th, noon: the barometer has commenced to rise slowly with gusts of wind from the s., sky cloudy, rain and squalls. The greater force of the gusts of wind have been from twenty-seven to thirty-two miles per hour; in the force of the squalls the gusts of wind inclined to sw. The cyclonic disturbance in the Gulf, more intensified and organized, has been slowly receding to the nw. Of the storm in San Domingo up to the present time there have been no indications whatever at Havana.

The following storm warnings were telegraphed from this office preceding and attending the advance of this depression off the Atlantic coast:

WASHINGTON, D. C., August 23, 1889—10.55 P. M.

Observers, Norfolk, Wilmington, Charleston, Savannah, Jacksonville, Cedar Keys, Jupiter, Mobile, New Orleans, Galveston, Key West:

Reports indicate that a severe storm is approaching Florida from the southeast, although dangerous winds have not occurred at any of the coast stations and conditions of storm are not sufficiently defined to justify the ordering of signals. Further notice will be given should the danger increase.

DUNWOODY.

WASHINGTON, D. C., August 25, 1889—10.55 P. M.

Observers, New York, Boston, Philadelphia:

Cyclone apparently following course of the Gulf Stream. It will doubtless pass well to the eastward. It is apparently central east of North Carolina.

DUNWOODY.

WASHINGTON, D. C., August 25, 1889.

Secretary Maritime Exchange, New York; Observer, Boston:

Cyclone apparently central southeast of Hatteras, moving northward. Centre not as yet clearly defined, but warnings stating that it is not safe to sail have been issued to Norfolk. Will communicate further information as received.

DUNWOODY.

WASHINGTON, D. C., August 25, 1889.

Observers, Norfolk, Norfolk section, Fort Monroe:

Hoist cautionary northeast signals at 11.10 a. m. Storm apparently central southeast of Hatteras, moving northward. Considered dangerous to leave port until further information is received showing more definitely the location of storm. Notice will be telegraphed.

DUNWOODY.

WASHINGTON, D. C., August 25, 1889.

Observers, Breakwater, Atlantic City, Sandy Hook, Narragansett section, Wood's Holl, Wood's Holl section:

Hoist cautionary northeast 12.40 p. m. Storm central off Hatteras, moving north. Brisk to high northeast winds indicated for middle Atlantic and south New England coasts.

DUNWOODY.

WASHINGTON, D. C., August 26, 1889—9.40 A. M.

Observers, Narragansett section, Wood's Holl, Wood's Holl section:

9.50 a. m. Change cautionary to storm northeast signals. Cyclone apparently moving northeastward following general course of Gulf Stream; apparently central to the southeast and distant from the coast. Dangerous gales will continue on the southeast New England coast.

DUNWOODY.

WASHINGTON, D. C., August 26, 1889—10 A. M.

Observers and displaymen, New Haven, New London, Newport section; Boston, Boston section:

Hoist cautionary northeast signals at 10.30 a. m. Storm apparently central to the southeast of New England and distant from the coast, moving northeast. Dangerous gales are indicated for the southeast New England coast to-day.

DUNWOODY.

WASHINGTON, D. C., August 26, 1889—12.10 P. M.

Observer, New York:

Hoist cautionary northeast signals at 12.30 p. m. Brisk to high northeast winds indicated for the middle Atlantic coast. Cyclone apparently central distant from the coast, moving northeast along the Gulf Stream.

DUNWOODY.

WASHINGTON, D. C., August 26, 1889—12.10 P. M.

Secretary Maritime Exchange, New York City:

Brisk to high northeast winds indicated for the middle Atlantic coast. Cyclone apparently central distant from the coast, moving northeast along the Gulf Stream.

DUNWOODY.

WASHINGTON, D. C., August 26, 1889—12.10 P. M.

Observers, Norfolk, Norfolk section, Fort Monroe, Breakwater, Atlantic City, Sandy Hook:

12.15 p. m. Continue signals. Brisk to high northeast winds indicated for the middle Atlantic and southern New England coasts. Cyclone apparently central distant from the coast, moving northeast along the Gulf Stream.

DUNWOODY.

WASHINGTON, D. C., August 27, 1889—12.20 P. M.

Observers, Norfolk, Norfolk section, Fort Monroe, Breakwater, Atlantic City, Sandy Hook, New York:

12.25 p. m. Continue signals. Storm apparently central off the North Carolina coast. Dangerous northeast winds will continue on the middle Atlantic and New England coasts.

DUNWOODY.

WASHINGTON, D. C., August 27, 1889—12.20 P. M.

Observers, Narragansett section, Wood's Holl, Wood's Holl section:

12.25 p. m. Change storm to cautionary. Storm apparently central off the North Carolina coast. Dangerous northeast winds will continue on the middle Atlantic and south New England coasts.

DUNWOODY.

WASHINGTON, D. C., August 28, 1889—12.35 P. M.

Observers, Norfolk section, Norfolk, Fort Monroe, Breakwater, Atlantic City:

12.45 p. m. Continue signals.

DUNWOODY.

WASHINGTON, D. C., August 29, 1889—9.45 A. M.

Observers, Norfolk section, Norfolk, Fort Monroe, Breakwater, Atlantic City:

9.45 a. m. Signals down.

DUNWOODY.

The following correspondence, by telegraph, was had with Commander G. W. Sumner, commanding the U. S. S. "Galena," relative to the movement of this depression and the storms attending it:

NAVY YARD, BROOKLYN, N. Y., August 24, 1889.

CHIEF SIGNAL OFFICER, Washington, D. C.:

Are the weather conditions along the coast favorable for starting for Hayti?

G. W. SUMNER,

Commander, U. S. N., U. S. S. "Galena."

WASHINGTON, D. C., August 24, 1889.

Commander G. W. SUMNER,

U. S. S. "Galena," U. S. Navy Yard, Brooklyn, N. Y.:

Weather conditions are not favorable; looks like a cyclone off Florida coast. Would advise delay in sailing until further notice.

DUNWOODY,

Acting Chief Signal Officer.

WASHINGTON, D. C., August 24, 1889—10.50 P. M.

Commander G. W. SUMNER,

U. S. S. "Galena," Brooklyn Navy Yard:

From the 8 p. m. reports to-night the conditions are less threatening than they have been during the past two days. The winds are all light on the coast, and the barometer about 30.00 inches at all southern stations. If the West India cyclone continues it is too far distant from the coast to affect land stations. It may, however, be moving northward east of the Gulf Stream.

DUNWOODY,

Acting Chief Signal Officer.

BROOKLYN, N. Y., August 25, 1889.

CHIEF SIGNAL OFFICER, Washington, D. C.:

Your last telegram received. If you have any later information in reference to the cyclone or coast weather please telegraph me at Sandy Hook.

G. W. SUMNER,

Commander U. S. N., U. S. S. "Galena."

WASHINGTON, D. C., August 25, 1889—3 P. M.

Commander G. W. SUMNER, U. S. N.,

U. S. S. "Galena," Sandy Hook, N. J.:

Have ordered warning signals at stations from Hatteras to Boston. Storm is probably dangerous off the middle Atlantic coast; wind at Henry thirty miles; Atlantic City twenty-four miles northeast, increasing.

DUNWOODY.

NOTE.—The "Galena" was signaled off Sandy Hook and this message delivered to her.

WASHINGTON, D. C., August 25, 1889—10.15 A. M.

Commander G. W. SUMNER, U. S. N.,

U. S. S. "Galena," Sandy Hook, N. J.:

The morning report indicates cyclone to the east of Hatteras although winds on coast do not exceed twenty miles at present. I have called for special reports during the day and will be able to telegraph you further information at 3 p. m.

DUNWOODY.

NOTE.—The "Galena" was signaled off Sandy Hook and this message delivered to her.

SANDY HOOK, N. J., August 25, 1889.

CHIEF SIGNAL OFFICER, Washington, D. C.:

All despatches received, many thanks for your kind attention and valuable information.

G. W. SUMNER, Commander, U. S. N.

SANDY HOOK, N. J., August 26, 1889.

CHIEF SIGNAL OFFICER, Washington D. C.:

U. S. S. "Galena" signals: "Can we sail south?" Answer yes or no.

DELAMOTTE, Manager.

WASHINGTON, D. C., August 26, 1889—9.40 P. M.

To Commander G. W. SUMNER, U. S. N.,

U. S. S. "Galena," Sandy Hook, N. J.

I do not consider it safe to sail from Sandy Hook to-night. Northeast gales continue off the coast from Hatteras to Nantucket. The force of wind will probably decrease, rendering it safe to sail to-morrow; but would not advise leaving until after Tuesday morning reports. Will telegraph you at 9 a. m., Tuesday.

DUNWOODY,

Acting Chief Signal Officer.

WASHINGTON, D. C., August 27, 1889—9.35 A. M.

To Commander G. W. SUMNER, U. S. N.,

U. S. S. "Galena," Sandy Hook, N. J.

It is not considered safe to sail south; the morning conditions are more threatening off the middle Atlantic and North Carolina coasts; probably blowing strong northeast gales within one hundred miles of Sandy Hook. Will send special report at 12 m.

DUNWOODY,

Acting Chief Signal Officer.

WASHINGTON, D. C., August 27, 1889—12.30 P. M.

Commander G. W. SUMNER,

U. S. S. "Galena," Sandy Hook, N. J.:

Not safe to sail from Sandy Hook south to-day. It is blowing a gale off the Virginia coast. Wind thirty-six miles northeast at Henry at 11 a. m.; thirty-two east at Block Island, and twenty-eight northeast at Atlantic City.

DUNWOODY,

Acting Chief Signal Officer.

SANDY HOOK, N. J., August 28, 1889.

CHIEF SIGNAL OFFICER, Washington, D. C.:

"Galena" signals: "Can we sail south; answer yes or no."

Replied: "Do not sail until after next report." Advise.

WM. DELAMOTTE, Manager.

WASHINGTON, D. C., August 28, 1889—9.45 A. M.

Commander G. W. SUMNER,

U. S. S. "Galena," Sandy Hook, N. J.:

No. Still blowing northeast gale off the Virginia and North Carolina coasts. Wind now thirty-six miles northeast at Cape Henry.

DUNWOODY,

Acting Chief Signal Officer.

WASHINGTON, D. C., August 28, 1889—12.41 P. M.

Observer, Sandy Hook, N. J.:

11 a. m. reports show wind decreasing in force; have called for 2 p. m. reports, and will telegraph the conditions at 3 p. m. It appears now as if it would be safe to sail this evening. Repeat to commander of "Galena."

DUNWOODY,

Acting Chief Signal Officer.

WASHINGTON, D. C., August 28, 1889—3 P. M.

Commander G. W. SUMNER,

U. S. S. "Galena," Sandy Hook, N. J.:

2 p. m. reports show wind decreasing in force. Safe to sail south to-night.

DUNWOODY,

Acting Chief Signal Officer.

IX.—Was the only tropical storm occurring during the month the centre of which passed over the continent. From numerous vessel reports and the accompanying data and descriptions prepared by Rev. Father Benito Viñes, S. J., the approximate course of this storm previous to the 22d is indicated on chart number i. While the regular telegraphic report would indicate that within a very extended area of barometric depressions two, and possibly three, disturbances may have existed, it is probable that the one traced as number ix continued its course as indicated, and certainly it is the only cyclonic disturbance observed in the Gulf which reached or passed over any portion of the United States. At 8 p. m. of the 22d this storm was apparently central near the mouth of the Mississippi to the southeast of Port Eads, La., but its presence could not be definitely determined at that report. Twelve hours later the centre had advanced to the vicinity of Mobile, Ala.; southeasterly gales were reported at Pensacola, Fla.,

while the wind was light and from the north at Mobile, Ala. The course continued northeasterly, passing over Alabama, northern Georgia, and central North Carolina during the succeeding twenty-four hours, attended by from two to three inches of rain at stations near the centre of disturbance, and southeasterly gales along the south Atlantic coast. The pressure increased slowly at the centre during the northeasterly movement with loss of energy, and when the disturbance reached the middle Atlantic coast the barometer at the centre was 29.88, and the greatest maximum velocity of wind was thirty-six miles per hour. As previously stated, it probably joined with low area viii in the lower Saint Lawrence valley.

Notes and extracts relative to the early history of this storm furnished the Chief Signal Officer through the courtesy of Rev. Father Benito Viñes, S. J.:

Havana, Sept. 13th, 1.00 p. m.: some indications of cyclonic movements are observed in the South Sea. The centre remains approximately to the S.  $\frac{1}{2}$  S. W. from Havana at a great distance. If the season were more advanced a storm from this quarter could be very dangerous; but being at present in the middle of September, it is probable that the present disturbance, following the general law of the trajectories formulated by me in the "Ciclono-copio de las Antillas para uso de los Marineros," is moving from the west to the south of the island.

Havana, Sept. 13th, 7.00 p. m.: the cablegram of Mr. Ramsden, which I received this evening, indicates a new centre of cyclonic disturbance south of Santiago de Cuba. This new storm appears to be more active and better organized than the one which is discovered south of Havana. It is very possible that the whole of these two simultaneous disturbances will constitute one vast depression in the South Sea, with two centres of cyclonic aspiration. Nothing is known at present regarding the direction of the trajectory of this new disturbance. The probability is that it advances to the west toward the vicinity of the Canal of Yucatan, and accordingly as its direction inclines more or less to the north of west, it will be felt with more or less intensity in the extreme western part of the island.

Santiago de Cuba, Sept. 13th, 10 a. m.: barometer 29.88; 2 p. m., 29.87; 3 p. m., 29.79; wind nne., velocity 15 miles; cirro-cumulus from ene., cumulus, high, from se.; cirrus from s. Holland Bay, wind n., gusts of wind; sea somewhat risen.

Havana, September 14th, 1 p. m.: the cyclonic disturbance of which I spoke in my first communication has come to us somewhat from the west; so that at present its centre remains approximately to the south-southwest. The ascending current in the centre of this disturbance is quite intense and rises to a great altitude, giving origin to brilliant solar halos. According to the cablegram just received the position of the centre of the other disturbance is apparently better determined and its position is approximately to the south-southeast of Santiago de Cuba and southeast of Jamaica. This confirms me in the opinion that the whole of these two disturbances forms a vast depression which embraces the whole of the South Sea. The case thus stated does not fail to present difficult complications hard to solve with the few observations which we have at our command. Already in Havana the upper currents are influenced by the other centre which threatens us in the southeast. In general, without doubt, it can be said that these vast depressions are not so much to be feared as the cyclones of a short radius. Besides, it must be remembered, as I have said before, that in these vast depressions the greater force of the wind and the squalls are not in the central region but on the outer edge. This explains, apparently, the interruptions of the telegraphic line in San Domingo, where winds from the 1st to the 2d quadrants have prevailed. While the cyclonic ring is advancing to the west the weather along the coast might become worse, with variable winds, squally and rainy weather, those from the northeast predominating and moving to southeast, with more or less intensity, according to the different localities that it strikes.

Santiago de Cuba, September 14th, 7 a. m.: barometer 29.82; wind ne., velocity seven miles per hour, cloudy, cirro-stratus from se., nimbus from ne. Jamaica: barometer 29.82, calm, covered, cirro-cumulus from ne. San Domingo: telegraph lines interrupted. Trinidad: last night, 13th, barometer 29.90; to-day rising; tempest from sw., sea agitated, wind increasing; Santiago de Cuba, 14th, 2 p. m.: barometer 29.80, wind ne., variable, velocity two miles per hour, light rain; 3 p. m., barometer 29.89, wind n., light rain. Island Barlovento: wind fresh se.; Saint Thomas, s.; Puerto Plata, ne. Cienfuegos, 2 p. m.: barometer 29.89, variable breezes ene., inclining to the n., cumulus from ne.

Santiago de Cuba, 15th, 7 a. m.: barometer 29.78, wind se., velocity five miles, variable, mists, nimbus from se.; continued rain, some strong gusts of wind from ene. at dawn; at 3 a. m., barometer 29.72; 3 p. m.: barometer 29.84, wind se., velocity three miles, variable, light rain, nimbus from se. and sse. Cienfuegos, 15th, 2 p. m.: barometer 29.72, wind nww., gusts of wind ne.; 3 p. m.: barometer 29.76, wind ese, nimbus strong from ne. Quemado de Güines, 15th, 9.15 a. m.: 14th, 10 a. m., barometer 29.88, wind n.; suffocating heat; 10 p. m., barometer 29.80, wind n., slight breeze; in the evening stronger, like 13th; 15th, 4 a. m.: barometer 29.76, wind n., breeze; squalls from 1.30 a. m.: 8.30 a. m.: barometer 29.80, sky covered, light rain e. and s., great belts of dark cumulus, wind n. and ne. Santa Clara, 15th, 12.15 p. m.: barometer 29.45; wind light, from nne., with oscillations to the n. and

ne.; squalls in the morning; direction of the clouds from ne. to sw. Santa Clara, September 15th: barometer 29.41, with tendency to fall; wind nne.; sky covered; very dark and cloudy weather in the third and fourth quadrants; gusts of wind and rain. Pinar del Rio, September 15th: barometer 29.65; wind nw.; cirro-cumulus from the n. Quemado de Güines, September 15th, 3 a. m.: barometer 29.80; wind ne., with slight gusts of winds and light rains; bad aspect of the sky to the se. and s.; at 3.25 p. m.: barometer 29.69; wind ne., slight gusts; light rains; cumulus low from ene.; in second quadrant, s. and w., followed by bad aspect of weather.

Havana, September 16, at 1 p. m.: the cyclonic disturbance which appeared on the 14th to the south-southwest of Havana moved towards us from the west. On the 15th in the morning the storm of Jamaica approached from the southeast, which was more intense and better organized than the former, and it increased in intensity. To-day it moves from the south toward the west. The direction of the trajectory is approximately to the west-northwest towards the coast of Texas. I consider the whole of these two disturbances, according to indications, to be an extensive area of low barometer which embraces the two cyclonic centres.

Havana, September 17th, noon: the central region of relative calm of the extensive area of low barometer, and the cyclonic ring of large clouds, winds, and squalls which surround this vast depression, of which I spoke in my former report, could not have been more marked yesterday evening, 16th; but while we in Havana were surrounded by a relative calm, the squalls ceased, the sky cleared up letting us see the solar disc encircled by halos, in the midst of a calm, with a suffocating, sultry heat and very low barometer; in Cienfuegos there was a cyclonic ring, with rising barometer, and heavy squalls from the south. The showers at dawn, with light winds and gusts, and some thunder, were owing, in my opinion, to the tail end of the Jamaica storm, the vortex of which was west-southwest. The clear weather which we had afterwards relates to the intermediate space between this storm and the cyclonic ring of the whole disturbance.

San Juan y Martinez, September 16th, 6 p. m.: barometer 29.72; cirrus clouds from s.; cumulus clouds to the w.

Havana, September 18th, noon: the nebulous edge of the latter portion of the depression has been crossing by Havana during the evening of yesterday the 17th, and last night, and this morning we find ourselves still in its outside portion. Yesterday evening we had brisk winds of 22 miles per hour, with gusts of 35 miles per hour; sky of a very stormy aspect and strong currents in the region of the rain-clouds.

Havana, September 19th, 9 a. m.: in the "Diario de la Marina" of to-day, in the section with the heading "The Weather," I read the following report, which confirms what has been said in relation to the vast depression which crossed to the south of the island in a direction to the wnw., toward the coast of Texas: according to telegram from Cayo-Hueso, received in the meteorological division, etc., the effects of the anterior edge of the depression must yesterday morning, the 18th, have been felt on the coast of Texas, while in Havana they were just receiving the outer edge of the following part (posterior part) of the nebulous disc of the same, so that the area of low barometer is very vast, since it embraces in its extremes the whole Mexican dominion and more. It is probable, in conformity to general laws of the trajectories in the different months, that this vast storm recurs on the coast of Texas, causing terrible inundations and disasters in an extensive zone. The steamboat "Mascotte," on its journey from Tampa to Cayo-Hueso, was on the evening of the 17th overtaken by hurricane winds from east shifting to southeast which finally acquired a velocity of sixty-five miles per hour. Cienfuegos, September, 19th, 2 p. m.: barometer 29.84; cirrus sky, cloudy, west; cirro-cumulus moving from west  $\frac{1}{2}$  northwest; slight winds, south-southwest; 3 p. m., barometer 29.84. Quemado de Güines, September 18th, 2 p. m.: 18th, 10 a. m., barometer 29.88; wind south, breeze; at 1 p. m., barometer 29.80; wind south-southwest.

[By telegraph to the New York Herald.]

CITY OF MEXICO, October 4, 1889.—A full report of the great cyclone on Carmen Island, off the coast of Campeche, has been received. The cyclone started about 2 o'clock on the afternoon of the 18th ultimo, and was heralded by a rapidly falling barometer. It did not, however, gain its full strength until night. The wind then shifted from the west to due south with an impetuosity that caused the vessels in the Carmen harbor to drag their anchors. Masts were snapped and sails torn in shreds. The following morning the shores were strewn with wreckage, there being only one vessel—the "Jova Del Lobregat"—that weathered the great gale out of thirty-five vessels of all kinds in the port. When the storm commenced all of the schooners that had sought refuge at a point called Quintilla were also wrecked.

The hurricane uprooted great trees, which fell upon houses in Carmen, destroying in all over one hundred and damaging two hundred and fifty others. The big extract factory, the Parochial Church, and the new hospital were seriously damaged. The authorities are now busily engaged in removing the trees from the streets and searching the ruins for dead bodies. So far only one death from the storm is reported, the captain of the brigantine "Enrique," Mr. R. Alcali, who was killed on the shore.

The losses occasioned in the city by the storm are estimated at \$500,000. News of great destruction to other towns near Carmen is now coming in. Pariscada and Partido have suffered the loss of many houses. In the vicinity of the last named town all crops are a complete loss. In Aquada de Purto Real, all the houses, with the exception of four, were destroyed by trees falling upon them. With the reports so far received the loss will not fall short of \$1,000,000.

NORTH ATLANTIC STORMS FOR SEPTEMBER, 1889 (pressure in inches and millimetres; wind-force by Beaufort scale).

The paths of the depressions that appeared over the north Atlantic Ocean during September, 1889, are shown on chart i. These paths have been determined from international simultaneous observations by captains of ocean steamships and sailing vessels received through the co-operation of the Hydrographic Office, Navy Department, and the "New York Herald Weather Service." Descriptions of the storms that appeared over the West Indies, the Caribbean Sea, and the Gulf of Mexico have been received through the courtesy of the Rev. Father Benito Viñes, S. J., Director of the Magnetic and Meteorological Observatory of the Royal College of Belen, Havana, Cuba, and the thanks of this office are also due to co-operating observers in the West Indies and the Bermudas for reports rendered relative to these storms.

Seven depressions have been traced for September, 1889; the average number traced for the corresponding month of the last six years being 9.3. Of the depressions traced for the current month, two were continuations of areas of low pressure which first appeared over the North American continent; two were of tropical origin, one of which advanced from east of the Windward Islands to the Virginia coast from the 1st to 13th, and the other recurved northeast of the Windward Islands on the 4th and 5th and apparently passed thence northeastward to the Azores by the 11th; one depression, described under the heading "Areas of low pressure," advanced westward over the Caribbean Sea from the 13th to 17th, and from the 18th to 22d probably moved westward over Yucatan and recurved northward to the middle Gulf coast; three first appeared over mid-ocean; and two advanced from the Gulf of Saint Lawrence northeastward over Newfoundland and disappeared north of the region of observation. No storm traversed the ocean from coast to coast, and the movements of the depressions over the north Atlantic were irregular. Over the western portion of the ocean disastrous storms and unusually high tides occurred along the coast from New England southward to the Carolinas, attending the advance of the depression traced northwestward from the Windward Islands, and in the Gulf of Mexico a storm devastated the Campeche coast during the latter part of the second decade of the month. On the 19th a severe storm was central on the middle New England coast, while during the last decade of the month unsettled weather prevailed over New England and the Canadian Maritime Provinces, attending the passage of depressions over the Gulf of Saint Lawrence and Newfoundland. Over mid-ocean the pressure continued low, with fresh to strong gales, from the 1st to 13th, and from the 22d to 26th stormy weather prevailed north and northeast of Newfoundland and the Grand Banks. Over the eastern part of the ocean in the vicinity of the British Isles fair weather prevailed until the 8th, from which date until the 12th the influence of the depressions over mid-ocean was felt, and from the 19th to the 24th the pressure was low and the weather unsettled over and near the British Isles.

Compared with the corresponding month of previous years, the storms that appeared over the north Atlantic Ocean during September, 1889, were slightly deficient in number, although their slow and irregular movements over mid-ocean occasioned a continuation of stormy weather along the trans-Atlantic steamship routes throughout the greater part of the month. The storms traced over the north Atlantic in September for preceding years varied in number from five in 1883 to thirteen

in 1884. Well-defined and destructive September cyclones have averaged about one per year over the West Indies, their usual path being westward from or near the Windward Islands to the Gulf of Mexico where they recurved northward. Among notable September West Indian storms charted and described in the REVIEW are: 1882, storm appeared north of San Domingo on the 2d, moved westward over Cuba to the central Gulf where it recurved to the Alabama coast by the night of 9th, following the usual parabolic path. 1883: storm moved from off the eastern extremity of Cuba on the 6th northwestward over the Bahamas to the North Carolina coast by the 11th. 1886: storm off the west Gulf coast moved northward to the middle Texas coast from the 22d to 24th. 1887: one storm advanced from east of the Windward Islands on the 11th westward over the Caribbean Sea and north of west over the Gulf of Mexico to the Texas coast by the 21st, and one moved northeast from the western extremity of Cuba over the Bahamas. 1888: one storm moved from north of Puerto Rico on the 1st westward over Cuba and Yucatan to the Mexican coast near Vera Cruz by the 7th, a very unusual course, and one passed from the Bahamas westward over southern Florida where it recurved northward during the 8th and 9th.

The following are brief descriptions of the depressions traced for September, 1889:

1.—Vessel reports indicate that this disturbance existed to the eastward of the Windward Islands on September 1st, probably central in latitude N. 14°, longitude W. 57°. Later reports indicate that it moved westward, passing over Saint Christopher during the night of the 2d, where the barometer fell to 29.50 (749), with wind northeast. From 10.15 p. m. of the 2d to 12.45 a. m. of the 3d winds light and calm, with falling barometer. At 2 a. m. of the 3d, the barometer had fallen to 29.38 (746), and the wind had shifted to southwest, indicating that the centre of the disturbance had passed to the northwest of this island. The approximate course of the centre of this storm is given on chart i, and the meteorological conditions attending its movement from day to day are exhibited on chart iv, upon which are traced isobarometric lines for each two-tenths of an inch from observations taken at noon, Greenwich time, by steamships and sailing vessels, and observations taken at 1 p. m., Greenwich time, at land stations. In tracing the isobarometric lines bounding this disturbance care has been taken to accurately represent the data received, and lines over extended areas from which reports have not been received depend for their values on adjacent reports. It will be seen from chart iv that this storm was central near Saint Thomas on September 3d, there being an extended area of barometric pressure covering a greater portion of the West India Islands at noon of that date, while a second barometric depression covered the middle north Atlantic, and an area of high pressure extended along the coast of the United States from Georgia to New England. On the 4th the depression over the West Indies had moved slightly to the northwestward, and vessel reports show that severe storms were experienced over the ocean in latitude N. 22° 55' and 36° 55', longitude W. 55°. The centre of disturbance passed to the northwestward near the Island of Saint Thomas on the 3d, and was near to and north of the Island of Puerto Rico on the 4th. It was especially severe and caused much damage to crops over these Islands, but it did not extend over San Domingo and the Islands to



the westward as a storm of marked energy. On the 5th it was probably central north of Puerto Rico near latitude N. 21°, longitude W. 67°, with an apparent tendency to move northward. Marine observations on the 6th indicate an extended depression covering more than ten degrees of latitude. Within this depression and near the extremities the following vessel reports indicate two centres of disturbance: Schooner "Gertrude," "6th, in N. 28° 44', W. 64° 52', barometer 29.52 (750), wind south, force 12; at 7 a. m., in N. 27° 32', W. 64° 49', barometer 29.49 (749); shifts of wind, se., sse., s., and sw.; highest force of wind 12." S. S. "Excelsior," "6th, in N. 28° 41', W. 78° 18', barometer 29.52 (750), wind northeast, force 4." No reports were received from the central portion of this barometric trough covering the 6th, but from observations taken in the vicinity the indications are that the barometric pressure was greater at intervening points than at the two centres of disturbance above referred to. Considerable weight is given to the observations above quoted, as these vessels afterwards approached the coast, and the readings of the barometers compared with those of land stations showed a probable error of less than one-tenth of an inch. The centre of disturbance in the eastern portion of the barometric trough developed the greatest energy, and its tendency to recurve to the northeast between the 5th and 6th would indicate that it was the continuation of the storm traced over the Windward Islands. There was an apparent tendency for this disturbance to recurve after the 5th and follow a normal northeast track, but the presence of an area of high pressure to the north and east interrupted this northeasterly movement and changed the course to the northwest. The mid-day report of the 7th indicated that the principal disturbance moved to the northwest, while that to the westward had disappeared.

During the 7th and 8th no reports were received from the central area covering at least 200,000 square miles, and it is therefore impossible to definitely locate the centre of the disturbance on those dates. Its northwesterly course continued until the 11th, the storm evidently increasing in energy as it approached the coast. After the centre reached N. 38°, W. 72° it was apparently forced to the southwestward by a still further re-enforcement of the area of high pressure to the northward, which not only retarded its easterly movement but caused it to disappear by a gradual increase of pressure while central on the middle Atlantic coast. The westerly movement of areas of low pressure is unusual in high latitudes, and when such movements occur they are usually attended by areas of high pressure to the northward which are apparently drawn to the east or southeast by a barometric depression far to the eastward. [Such a storm occurred on March 25, 1878, when the centre of the disturbance passed from east of Newfoundland westsouthwest over New England and the middle Atlantic coast, the pressure decreasing more than two-tenths of an inch during the westerly movement.] The approach of the centre of disturbance toward the coast was attended by great increase of energy. While this storm was severe and caused great damage to shipping and loss of life, the records of this service show numerous instances of storms which were more destructive both to life and property. "The hurricane of August 14 to 27, 1873, was the most destructive storm that ever visited the Atlantic coast; it recurved between the island of Bermuda and Cape Hatteras, and its centre at no time touched the coast line, although warning signals were ordered for stations on the northeast coast. Twelve hundred and twenty-three vessels were known to have been destroyed, and two hundred and twenty-three human lives were definitely reported as lost. The storm of September 15, 1875, caused a loss of one hundred and seventy-six lives, and three-fourths of the town of Indianola, Tex., was swept away. The hurricane of October 21 to 24, 1878, probably caused more damage. It entered the United States near Wilmington, N. C., and moved due north, and passed over Washington City and eastern Pennsylvania, after which it curved eastward, and crossing New England left the coast near Portland, Me. At Philadelphia, Pa., over seven hundred substan-

tial buildings were totally destroyed or seriously damaged, bridges injured, and twenty-two vessels sunk, entailing a loss variously estimated at from \$1,000,000 to \$2,000,000. Other loss of life and great damage by freshets and winds occurred elsewhere in Pennsylvania. A large number of steamers, ships, and coasting vessels were dismantled, wrecked, or sunk along the New Jersey, Virginia, and North Carolina coasts, entailing loss of life and immense pecuniary damage. The wind reached seventy-two miles per hour at Philadelphia, and from eighty to eighty-eight miles along the coast. The hurricane of August 16-20, 1879, entered the United States at Cape Lookout, N. C., and skirted the Atlantic coast thence northeastward to Eastport, Me. An enormous amount of damage resulted from this storm. Not only was the damage to inland property very excessive, but the damage to maritime interests may be estimated from the fact that over one hundred large vessels were shipwrecked, dismantled, or disabled, and two hundred yachts or smaller vessels injured. The wind reached a measured velocity of one hundred and thirty-eight miles per hour at Cape Lookout, where the anemometer was carried away. The barometer fluctuated with extraordinary rapidity, there being a fall of .85 inch in five and one-half hours off the New Jersey coast, followed by a rise of .93 inch in six and one-half hours. August 23d-28th, 1881: a storm entered the United States near Savannah, Ga., and followed a very unusual course to the northwestward to Minnesota. The loss of life and damage to property in Charleston, S. C., Tybee Island, and along the adjacent coast was very great. About four hundred persons lost their lives, and hundreds of houses were totally destroyed. The loss of property was estimated at over one and one-half million of dollars. A similar storm passed over Charleston August 23d-24th, 1885, where damage to the extent of nearly two millions of dollars was done, and twenty-one lives were lost. On August 19-20, 1886, a storm completely destroyed Indianola, Tex., which was nearly swept away in September, 1875. Not a house was left standing, and over twenty lives were lost. Galveston, Tex., also suffered great damage."

The following telegrams and reports furnished by the Rev. Benito Viñes, S. J., are descriptive of this depression and of the destructive storms which attended it over the West Indies: "3d.—Saint Christopher, W. I.: last night, 2d, barometer, 29.50 (749); wind, ne. From 10.15 p. m., 2d, to 12.45 a. m., 3d, wind light and calm with falling barometer; 2 a. m., 3d, barometer, 29.38 (746), wind changing to sw.; 2.30 a. m., 3d, barometer, 29.70 (754), wind and sea dreadful. English s. s. 'Roraima' and schooner 'Circe' were lost; the crews were saved. Havana, Cuba, 3d: a cyclone of great intensity appeared this morning near Santa Cruz and Saint Thomas. The vortex was approximately to the ese. of Puerto Rico. Santiago de Cuba: at Puerto Rico yesterday, 2d, at 7 a. m., barometer, 29.92 (760); at 3 p. m., 29.84 (758); to-day, 7 a. m., 29.76 (756); wind, ne. The barometer at this place at 3 p. m. to-day, 29.85 (758); at Santa Cruz, at 3 p. m. to-day, barometer, 29.65 (753); wind, sw., cyclone path, wnw. Santa Cruz, 5 p. m.: cyclone very severe from 9 a. m. to noon; wind yet strong from sw.; no communication to-day with Saint Thomas. San Domingo, 4 p. m.: barometer, 29.72, (755); strong north sea; thunder-claps. Havana: the last cablegrams received indicate that the vortex of the cyclone remained this afternoon between Santa Cruz and Puerto Rico, and that the trajectory of the cyclone is to the wnw. Supposing this direction, the storm will probably cross over the island of Puerto Rico, will later touch the north coast of San Domingo, and will make itself felt with more or less intensity on the north coast of Cuba from the 6th to the 7th. 4th.—Santiago de Cuba: 7 a. m., barometer, 29.88 (759); cirro-cumulus from e., high cumulus from ene.; 2 p. m., barometer, 29.81 (757), blue sky with only one current cumulus high from ene.; wind se., fine weather; 3 p. m., barometer, 29.81 (757), mist, wind n. and light variable; 10 p. m., barometer, 29.90 (759), calm, cloudy. San Domingo: 9 a. m., barometer, 29.80 (757), clear, wind n., strong. Puerto Plata:

3.45 p. m., wind nnw., light, rainy, swelling sea. San Domingo: 5 p. m., a violent storm with torrents of rain since 1 p. m., barometer, 29.75 (756), wind changed from e. to nw. Saint Thomas: the storm of yesterday, 3d, caused great damage in the country; the barometer fell to 28.97 (736). The telegraphic and traffic lines are interrupted. Santa Cruz: during the storm of yesterday, 3d, much damage was caused. Havana, 4th: from cablegrams received here it is understood that the cyclone passed a short distance north of Saint Thomas, and this morning its vortex remained approximately to the wnw. of the capital of Puerto Rico, slowly advancing to the north coast of San Domingo. According to reports it appears that the storm is of great diameter and intensity, and notwithstanding it is announced from Santiago de Cuba with path towards wnw., its trajectory appears to incline somewhat more to the n., in which case it is possible that its influence, not its effects, will be felt in this island. 5th.—San Domingo: 7 a. m., barometer, 29.88 (759), cloudy, wind n., light; storm ceased 11 p. m., 4th. Santiago de Cuba: 7 a. m., barometer, 29.89 (759), wind ne., light, cloudy. Havana, 5th: according to telegrams just received the winds from the left side of the trajectory of the cyclone have at present made themselves felt very forcibly on the north coast of San Domingo, and it is probable that from the 6th to 7th, according to the general rule, it will make itself felt with more or less severity on the north coast of the eastern part of Cuba. The cyclone is apparently violent and of short radius, and advances slowly. The direction of the trajectory, which in the neighborhood of Puerto Rico will be toward wnw., approximately, will probably incline more to the n. in proportion as the cyclone advances in latitude, thus preparing to recurve, which will probably take place in the proximity of Florida in a latitude between 27° and 29°. The reports confirm the opinion of yesterday with regard to the course of the cyclone; in diameter it is not apparently as great as thought in the beginning. 6th.—Havana: meteorological reports indicate a rise of the barometer and good weather; from this I deduce that the cyclone followed a very large trajectory; there is, in consequence, no probability that it can pass over this island. The vortex of the cyclone passed over the island of Saint Christopher from 10 p. m. to midnight of the 2d, and on the 3d it crossed a short distance north from Saint Thomas, and from the strong velocity of the wind, the low minimum barometer, and the difference of barometer between Saint Thomas and San Juan de Puerto Rico, a difference of more than .71 (18), between points in near proximity to each other, makes me suppose a strong barometric gradient and a very rapid barometric fall, which only verifies itself in violent cyclones of a certain radius and in the proximity of the vortex. From the known position of the cyclone on the 4th and 5th, the velocity of translation of the storm is shown to be a little more than eight miles per hour, a movement which is indeed remarkably slow. The diameter of the vertical calm during its passage over Saint Christopher was, according to this, a little more than sixteen miles."

The following reports indicate the character of the disturbances which attended this depression off the coast of the United States. The first positive information that this storm had reached the coast of the United States was received from the Signal Service station at Block Island, R. I., at 8 a. m., on the 9th, when during a sudden squall, the wind rose to forty-eight miles per hour from the northeast. The observer reports that the storm did not begin until 5 p. m. of that day: Atlantic City, N. J.: the high northeast winds which prevailed from the 8th to the 12th attained a maximum velocity of seventy-two miles per hour at 2.30 p. m. of the 10th, causing the tide to rise very high on those dates, the highest point being reached during the night of the 10-11th, when the meadows along the water front and a portion of the city were inundated. Great destruction to property occurred in this city and along the beach by the wind and tide.—*Report of W. J. Blythe, observer, Signal*

*Corps.* Philadelphia, Pa.: high northeast wind, maintaining a steady velocity of forty to forty-five miles an hour, prevailed throughout the day of the 10th, and continued into the day of the 11th, with an extreme velocity of sixty miles per hour on the 10th. All telegraphic communication between here and Atlantic City was cut off during the 10th and 11th.—*Report of L. M. Dey, observer, Signal Corps.* Egg Harbor City, N. J., 10th: during last night and to-day a severe northeast storm has prevailed. Much damage has been done to crops and fruit trees in this section.—*Report of H. Y. Postma, voluntary observer.* Baltimore, Md.: the storm which prevailed with great persistence from the 10th to the 12th was very severe on Chesapeake Bay. All steamers arriving in this port have been delayed six to twelve hours by the storm.—*The Baltimore, Md., Sun, September 12.* Lewes, Del.: a most destructive storm raged in this section from the 8th to the 12th. The telegraph station was washed away, the marine hospital dashed from its moorings, and the life-saving station, located forty feet above high water mark, was flooded and the foundation undermined. Humphreyville, a suburb between the town and the beach, was submerged, and its two hundred inhabitants fled for their lives. Thirty-one vessels are known to have been wrecked or washed ashore, and the damage to shipping is estimated at \$570,000. The total number of lives lost will probably exceed forty.—*The Baltimore, Md., Sun, September 13.* It is estimated that the bulk of the losses caused by the storm to railroad and vessel owners will reach \$1,786,000.—*The Record, Philadelphia, Pa., September 13.* Reports from Signal Service stations show that violent storms and unusually high tides occurred along and off the Atlantic coast from New England to North Carolina from the 8th to the 12th.

Upon the receipt of information from the West Indies that a severe storm existed over the Windward Islands, the principal ports on the coast of the United States from New England to Florida, and the Hydrographic Office, U. S. Navy, were notified. The probable course of the storm was also indicated, as shown by the following telegrams, sent by order of the Chief Signal Officer:

WASHINGTON, D. C., September 5—10.35 a. m.

Secretary, Maritime Exchange, New York City:

Cyclone in West Indies passed over San Domingo yesterday at 6 p. m. Variable winds from east to northeast. ALLEN.

WASHINGTON, D. C., September 5—2.58 p. m.

Observers, Norfolk, Wilmington, Southport, Charleston, Savannah, and Jacksonville:

Cyclone reported north of Hayti apparently moving north. ALLEN.

The following correspondence was had with Capt. J. M. Lachlan, General Manager of the United States and Brazil Mail Steamship Company, relative to this storm:

[Telegram.]

OFFICE OF THE UNITED STATES & BRAZIL MAIL STEAMSHIP COMPANY,  
NEW YORK CITY—6.28 p. m., September 10, 1889.  
GENERAL GREELY, U. S. Signal Service, Washington, D. C.:

This company intends to dispatch their steamship "Advance" to-morrow, 11th, to Newport News, en route for Brazil, calling at Saint Thomas. Please wire indications and recommendations as to judiciousness of postponement. We are informed heavy meteorological disturbances exist off Hatteras region. Will thankfully pay for reply.

J. M. LACHLAN,  
General Manager U. S. & B. M. S. S. Co.,  
Mills Building, 23 Broad St., New York City.

[Telegram.]

WASHINGTON, D. C., September 10, 1889—9.30 p. m.  
CAPT. J. M. LACHLAN, General Manager U. S. & B. M. S. S. Co.,  
Mills Building, 23 Broad St., New York City:

Dangerous to sail; violent gale off Hatteras. Will wire you again by 11 a. m. to-morrow morning.

GREELY,  
Chief Signal Officer.

[Telegram.]

WASHINGTON, D. C., September 11, 1889—11 a. m.  
CAPT. J. M. LACHLAN, General Manager U. S. & B. M. S. S. Co.,  
Mills Building, 23 Broad St., New York City:

Gale still continues from New York to Hatteras; dangerous to sail. If storm has abated by night will advise you.

GREELY,  
Chief Signal Officer.

[Telegram.]

WASHINGTON, D. C., *September 11, 1889—10.50 p. m.*CAPT. J. M. LACHLAN, *General Manager U. S. & B. M. S. S. Co.,**Mills Building, 23 Broad St., New York City :*

Storm has not moved since morning. High northeasterly winds to the Capes of the Delaware, and thirty to thirty-five miles per hour from the north-east from there south.

GREELY,  
*Chief Signal Officer.*

[Telegram.]

NEW YORK, *September 12, 1889—6.13 p. m.*GENERAL GREELY, *U. S. Signal Service, Washington, D. C.:*

Many thanks for your most valuable information and aid to commerce. I have again postponed sailing "Advance" till ten a. m. to-morrow. Nearly all ships that sailed since last Monday are at anchor in lower bay; some have returned after having been outside. Our ship is lying securely fast at dock.

J. M. LACHLAN,

*General Manager U. S. & B. M. S. S. Co.*

[Letter.]

OFFICE OF THE UNITED STATES &amp; BRAZIL MAIL STEAMSHIP COMPANY.

NEW YORK, *September 12, 1889.*GENERAL GREELY, *U. S. A., Chief Signal Officer, Washington, D. C.:*

DEAR SIR: On Tuesday, 10th, I wired you as per enclosed copies, which I now confirm, and here received the following replies from your office, copies herewith annexed. I wired your good self this p. m., copy herewith, which I also confirm.

I desire, on the part of this company, to sincerely thank you for the prompt and valuable information furnished in respect to the indications, and to state, so sure was the writer of the absolute certainty of your messages, that I had no hesitation whatever in postponing the steamship "Advance." A number of foreign and coasting steamships sailed from here, but it did not give us the slightest uneasiness as we were quite sure they could not go far. We now find that nearly all of these ships are at anchor in the lower bay, with two anchors down, rolling and tumbling about in the heavy swell down there. Our ship is lying secured, fast to her wharf, not burning coal, nor doing any damage. If any ship can go outside ours can, but is it prudent to do so when it can be avoided? On Saturday, the 7th, we received a cable from Saint Thomas, W. I., advising of arrival and sailing from thence, bound south. The cable further stated: "Hurricane, no damage."

There is no doubt but what this is the same cyclone on its way northward and I have no doubt also that you have observed the slowness of its speed in its track; however fast it may be revolving it seems to have a large area. Seeing the extraordinary high tides on Sunday a. m., and not seeing the ebb go down to its normal level put the writer on the *qui vive*, and he determined to consult your office before despatching the s. s. "Advance." No doubt we shall hear of numerous casualties shortly on this coast and off shore.

Again thanking you,

I am, yours truly,

J. M. LACHLAN,

*Manager.*

1.—This depression was central over or near the Windward Islands on the 1st and 2d, whence it moved northwest to about N. 28°, W. 68° by the 4th, where it recurved and passed west and north of Bermuda to the thirty-fifth parallel by the 5th, and on the morning of the 6th was central off the southern edge of the Banks of Newfoundland, after which it apparently dissipated. This depression exhibited greatest energy on the 5th, when strong to whole gales were encountered north and northeast of Bermuda.

3.—The presence of a barometric depression near western Cuba was indicated by reports of the 4th and 5th, and by the 6th the centre of disturbance had apparently advanced northeastward to north of the Bahamas, whence it moved rapidly northeast to the fortieth parallel by the 7th, and thence passed northward to the lower Saint Lawrence valley by the 8th. This depression augmented in energy until the 7th, when pressure below 29.60 (752) and fresh to strong gales were reported off the middle Atlantic and New England coasts. The northerly course of the storm after the morning of the 7th was apparently due to high barometric pressure to the east and northeast, the barometer over Newfoundland ranging to 30.47 (774) at Saint John's, giving a gradient of about .90 of an inch in about nine hundred miles on the morning of that date.