

Tannehill (1938) has listed one storm case for 1869 and two additional cases were referred to by Ludlum (1963). The author of this study have documented seven new cases, making the known storms for 1869 to have increased from 3 to 10. The author's contribution represents, therefore, a 233 percent increase.

Storm 1, 1869 (Aug. 12).

This is the first new storm which the author of this study has documented for 1869. A short, one-day track for the storm is displayed in Fig. 5.

Documentation of Storm 1, 1869 was based on the following information: 1) Bark "Olaf Nicklesen" had a hurricane from E. going around to W. at lat. 43 52 N., long. 44 07 W. on Aug. 12 (The New York Times, Aug. 28, 1869, p.8, col.6). 2) Bark "Prinze Frederik Carl" ((from Bristol in 60 days). Experienced a heavy hurricane on Aug. 12, from S., S.W. and N.W., lasting 18 hours. Aug. 17, lat. 44 45 N., long. 48 W., spoke a British ship steering W.N.W. which reported to have lost all sails in the hurricane of the 12th (The New York Times, Sept. 5, 1869, p.8, col.6). 3) Bark "Anna" (from Gibraltar, Jul. 13). Had a S. gale at the edge of the Gulf Stream on Aug. 13 (The New York Times, Sept. 1, 1869, p.8, col.6).

The track for the storm was based primarily on items 1) and 2), having been item 3) of a very limited use because no position was given for the "Anna". The storm was estimated to have been near 42 degrees North, 46 degrees West in the morning of Aug. 12 and its northeastward motion was inferred from the wind shift from E. to W. reported by the "Olaf Nicklesen" after assuming that, during the ship-storm encounter, the ship motion was negligible when compared with the storm motion.

Storm 1, 1869 apparently reached hurricane intensity.

Storm 2, 1869 (Aug. 16-17).

This storm has not been listed by Tannehill (1938) but Ludlum (1963) has referred to it before. The author of this study has prepared the track for Storm 2, 1869 which is shown in Fig. 5.

The following information was useful in studying the storm: 1) There was considerable damage at Refugio, the storm having appeared about dark (Aug.16) and continued throughout the night, abating about daybreak (Ludlum, 1963). 2) Indianola: Last Monday night (Aug.16) the city was visited by a severe gale which increased to almost a hurricane blowing in gusts that were terrific at times. Several houses were blown from their foundation and the Episcopal church was almost demolished (Ludlum, 1963). 3) Port La Vaca: About dusk (Aug.16) the wind rapidly increased from the N. and turned to a gale. About 11 P.M. the wind went around to E. and increased its fury. This brought one of the highest tides witnessed in the bay for some years. After midnight the wind veered more to the S. The storm reached its climateric about 2 A.M. Aug. 17 but did not abate before daylight (Ludlum, 1963). 4) Schr. "Julia A. Rider" (from Indianola in 25 days). Aug. 17, had a severe hurricane which lasted

for 7 hours (The New York Times, Sept. 15, 1869, p.8, col.6). Author's note: The vessel must have been at Indianola on Aug. 17. The "Julia A. Rider" should have left Indianola around Aug. 20 in order to have taken 25 days to arrive in New York on Sept. 14, the previous day the note was published.

The information above supports hurricane intensity for Storm 2, 1869.

#### Storm 3, 1869 (Aug. 27).

This is the second new storm that the author of this study has documented for 1869. A short, one-day track for the storm is shown in Fig. 5.

Documentation of Storm 3, 1869 was based on the following information: The Royal Mail Company's ship "Siene" arrived at St. Thomas from England on Sept. 1 and reported that 1200 miles to the eastward of the island encountered a hurricane on Aug. 27, which was travelling to the N.N.W. She passed through the storm without any loss (The Times, London, Sept. 28, 1869, p.4, col.6). Author's note: The ship is estimated to have been near 34 degrees North, 47 degrees West on Aug. 27.

The author decided to prepare the track (Fig. 5) in order to denote the motion to the N.N.W. that the "Siene" estimated for the hurricane.

#### Storm 4 (1869 (Sept. 1-2)).

This is the third new storm that the author of this study has documented for 1869.

Documentation of the storm was based on the following information: 1) Brig "Harriet" (from Nassau in 13 days). Had previously sailed from Nassau to New York on Aug. 29 and had a heavy N. gale on Sept. 1 in which lost mainmast and sustained other damage, having returned to Nassau for repairs (The New York Times, Oct.1, 1869, p.8, col.5). 2) Brig "Mary Celeste" (from St. Martin in 17 days). Had a severe gale off Bermuda on Sept. 2 during which lost and split sails (The New York Times, Sept. 9, 1869, p.8, col.6).

Information in items 1) and 2) was insufficient for the author to determine a track for Storm 4, 1869. Therefore, he decided to place the storm near 29 degrees North, 71 degrees West on Sept. 1-2 (Fig. 5).

#### Storm 5, 1869 (Sept. 4-5).

This is the fourth new storm that the author of this study has documented for 1869. A track for Storm 5, 1869 was prepared and is shown in Fig. 5.

The following information allowed one to document the storm: From The New Orleans Commercial Bulletin, Sept. 7. The rain commenced falling about midnight on Saturday night (Sept.4) and by daylight (Sept.5) the streets were flooded and a furious gale was sweeping over the city uprooting trees, postrating fences, etc. Up to about noon, a dretching rain was coming down and the wind,

steady from the N., at times came in blasts having little less force than a veritable hurricane. From noon out, the rain fell continuously with only a few slight intermissions and the wind kept shifting from point to point until it settled into as southerly gale. About 8 o'clock by night both rain and wind ceased. At Grand Isle, the wind had been blowing from the east before the great storm came on Saturday night (Sept.4) when a terrific gale commenced. The sea rose fast on Sunday morning (Sept.5). The wind shifted to N.E. and from 10 A.M. to noon it blew directly from N.W.. Mr. Tattus, a hotel agent who gave this narrative, said that the water was 2 feet high about his hotel. The storm abated about 2 P.M. and by night, the island was again dry (The New York Times, Sept. 12, 1869, p.3, col.5).

After discarding the northerly wind reported to have occurred at New Orleans in the morning of Sept. 5 because it did not seem to be consistent with the remaining information for New Orleans and Grand Isle, the author located the storm near the delta of the Mississippi River, just to the S.E. of Grand Isle, at 7 A.M. Sept.5 and just to the west of New Orleans in the afternoon. The storm appears to have been moving towards the N.N.W. and backward extrapolation in time allowed the author to infer an estimate for the storm position in the morning of Sept. 4. The track shown in Fig. 5 resulted from the procedure just described.

#### Storm 6, 1869 (Sept. 7-8).

Tannehill (1938) has included this storm in his list and Dunn and Miller (1960) and Ludlum (1963) have referred to this storm as well. The author of this study has prepared the track for Storm 6, 1869 which is displayed in Fig. 5.

The following information was used in studying the storm: 1) Message from Washington, D.C. The U.S. Consul at Nassau advised that the brig "Star Castle" arrived in Nassau in distress, having experienced a hurricane on Sept. 7 (The New York Times, Oct. 27, 1869, p.8, col.5). 2) Schr. "Anna A. Holton" had a heavy S.E. gale at lat. 31 N., long. 73 W. on Sept.7 while sailing from New York to St. Martin (The New York Times, Oct. 25, 1869, p.8, col.5). 3) Brig "Charles Williams" (coming to New York from Cienfuegos) encountered a terrible hurricane on Sept. 7. Wind blew from N. to S.W. (The New York Times, Sept. 11, 1869, p.8, col.6). 4) Schr. "Emma D. Freimy", lat. 33 N., long. 75 W., experienced a N.E. gale on Sept. 8 (The New York Times, Sept. 22, 1869, p.8, col. 6). 5) Bark "Gazelle" encountered a hurricane commencing from S. and veering around to N.W. on Sept. 8. Barometer fell from 30.05 to 28.24 inches (The New York Times, Sept. 11, 1869, p.8, col.6). 6) Bark "Hannah H." encountered a hurricane at lat. 37 40 N., long. 73 W. on Sept. 8, which lasted for 6 hours. Barometer fell from 30.01 to 28.04 inches (The New York Times, Sept. 11, 1869, p.8, col.6). 7) Ship "Nagpore", lat. 38 N., long. 72 12 W., blowing a complete hurricane on Sept. 8; gale lasted 2 hours (The New York Times, Sept. 12, 1869, p.8, col.6). 8) Bark "Amilcare". Sept. 8, lat. 38 48 N., long. 72 47 W., experienced a heavy gale from S.E., lasting for 6 hours (The New York Times, Sept. 12, 1869, p.8, col.6). 9) Ship "Calliope". Sept. 8, lat. 40 04 N., long. 72 W., experienced a

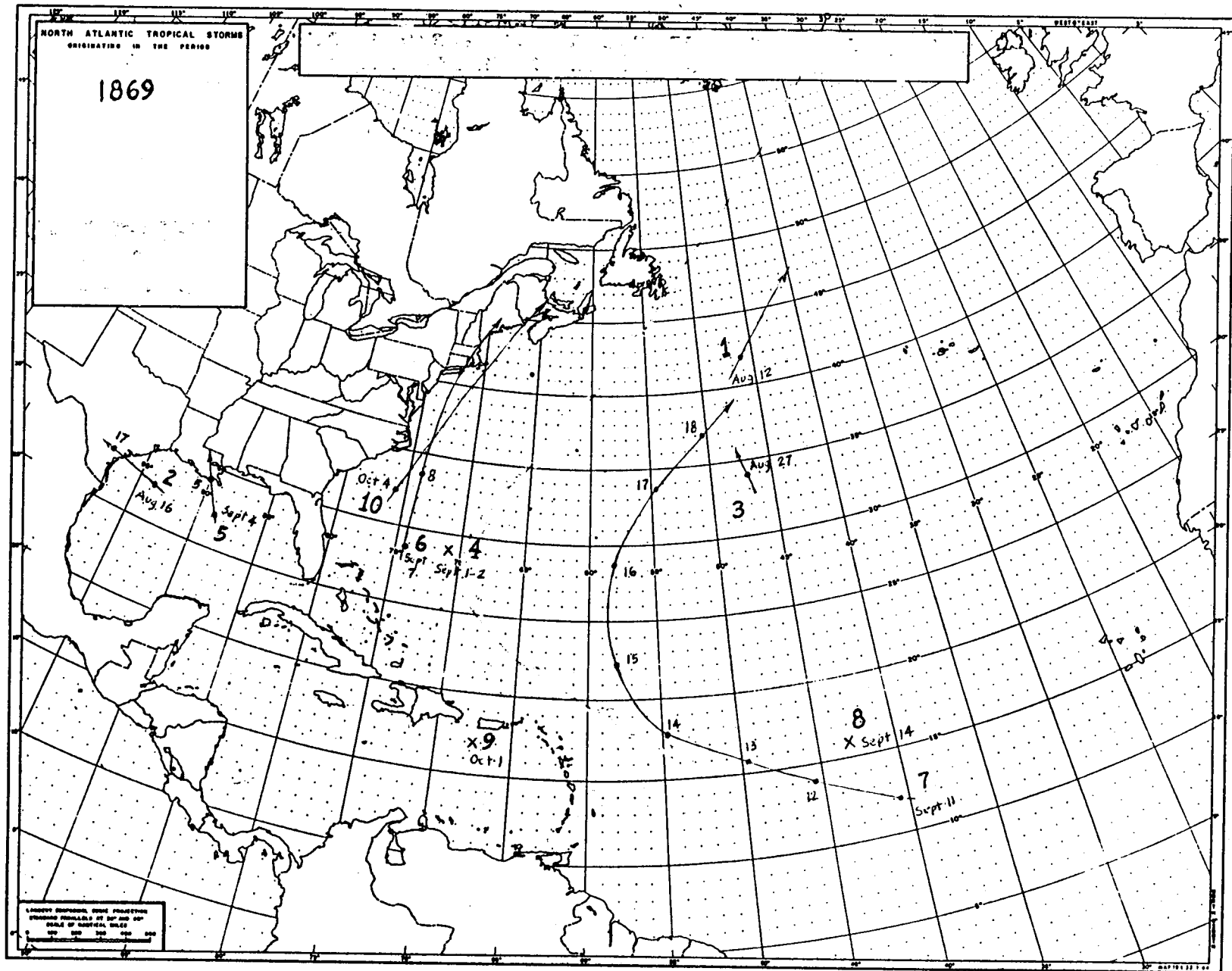


Fig. 5

hurricane from S.E., lasting for 6 hours and causing a tremendous cross sea (The New York Times, Sept. 12, 1869, p.8, col.6). 10) Ship "Excelsior", off Nantucket, Sept. 8, experienced a severe hurricane from S.E., lasting 6 hours (The New York Times, Sept. 12, 1869, p.8, col. 6). 11) Ship "Tamerlane", lat. 39 49 N., long. 70 19 W., encountered a W.S.W. to S.E. terrible gale on Sept. 8, lasting for 8 hours (The New York Times, Sept. 13, 1869, p.8, col.6). 12) Bark "Southern Bell" encountered a terrific hurricane on Sept. 8 (The New York Times, Sept. 13, 1869, p.8, col.6). 13) Brig "Cora" had a hurricane on Sept. 8 (The New York Times, Sept. 13, 1869, p.8, col.6). 14) Schr. "Julia D.", lat. 36 20 N., long. 73 W., had a heavy gale on Sept. 8 (The New York Times, Sept. 13, 1869, p.8, col.6). 15) Bark "Johannan Kepler" had a heavy S.S.E. gale at lat. 40 25 N., long. 70 30 W. on Sept. 8 (The New York Times, Sept. 14, 1869, p.8, col.6). 16) Brig "Codan" encountered a hurricane of great violence at lat. 38 N., long. 70 40 W. on Sept. 8 (The New York Times, Sept. 14, p.8, col.6. 17) Brig "Oma" encountered a S.S.E. hurricane on Sept. 8 at lat. 38 N., long. 71 W., lasting for 8 hours (The New York Times, Sept. 14, 1869, p.8, col.6). 18) Bark "Cabral". Sept. 8, encountered a hurricane but received no damage (The New York Times, Sept. 14, 1869, p.8, col.6). 19) Brig "Sanderson", lat. 36 40 N., long. 74 W., experienced a hurricane from S.E. to S. on Sept. 9 (?) which lasted for 8 hours (The New York Times, Sept. 17, 1869, p.8, col.6). Author's note: It should be Sept. 8. 20) The estimated width of the path of destruction was 40-50 miles, all to the east of the apparent path of the center. Lowest pressure over land was about 29 inches. Five to ten miles west of the center there was no destruction but also there was no wind. The center probably cut across the eastern tip of Long Island, striking the Connecticut-Rhode Island coast near the interstate border and then continuing towards the N.N.E. over western Rhode Island to the west of Newport and Providence. The storm entered eastern Massachusetts between Worcester and Boston and then moved to S.E. New Hampshire and rushed to western Maine. At Milton, to the S. of Boston, the barometer fell to 28.75 inches at 6 P.M. (Sept.8). At Boston, the weatherman for the Evening Traveller kept a log for that day. By 4:45 P.M. the gust of wind had become severe from E.S.E. The observer thought that the heaviest blast occurred at 6:12 P.M. with the lowest barometer of 29.02 inches. At Gardiner, 50 miles N.E. of Portland, the wind blew almost a hurricane from the S.E. by 8 P.M. Soon after 10 P.M. the wind lulled and by 11 P.M. was blowing strong from S.W. Minimum pressure was 29.14 inches at 9 P.M. (Ludlum, 1963). 21) An article on the storm. Headlines are, among others: Great loss of property at Boston. The Colliseum greatly injured and the Jubilee Organ injured. Church steeples prostrated and trees torn up by the storm. Additional information: At Providence, Rhode Island, the weather had been fitful and squally all day (Sept.8). About 4 P.M. the wind increased to a hurricane from S.S.E. and for an hour spread havoc and devastation on every side. The tide rose very rapidly from 4 to 5 o'clock when the gale was at its highest and soon after 5 overflowed the wharves and filled the cellars on Dyer Street. The wind lulled at about 6 and at 6:30 the water began to recede and fell rapidly afterwards (The

New York Times, Sept. 10, 1869, p.5, col.1-4).

The lowest pressure of 28.04 inches reported by the bark "Hannah H." (item 6) allows one to infer that Storm 6, 1869 was an intense hurricane.

Storm 7, 1869 (Sept. 11-18).

This is the fifth new storm that the author of this study has documented for 1869. A track for this storm is displayed in Fig. 5.

The following information was used in the process of documenting Storm 7, 1869: 1) Ship "W. G. Russell" encountered a hurricane from N.W. to S.E. at lat. 12 N., long. 41 W. on Sept. 11 (The New York Times, Oct. 3, 1869, p.8, col.5). 2) Brig "Ara" experienced a severe hurricane on Sept. 12 at lat. 18 N., long. 47 W. Wind from S.W. to N.E. She arrived at St. Thomas in a cripple condition (The Times, London, Oct. 16, 1869, p.5, col.6). 3) Brig "San Antonio" (Spanish) arrived at St. Thomas in distress on Sept. 22. She encountered a severe gale on Sept. 14 and 15 in lat. 19 40 N., long. 47 40 W. (The Times, London, Oct. 16, 1869, p.5, col.6). Author's note: The longitude is probably west of San Fernando; add about 6 degrees to convert into Greenwich. 4) The following is reported on the outward passage of the "Tasmania": On the night of Sept. 14 and the morning of Sept. 15, the "Tasmania" (from England to St. Thomas) encountered a terrific hurricane about 400 miles eastward of St. Thomas. The barometer began to fall about 10 P.M. Sept. 14 and at 11 A.M. Sept. 15 fell to 28.90 inches, the wind having gone from E. to N. to W. The ship had a fearful struggle with the tempest, being for hours on her beam ends (The Times, London, Oct. 16, 1869, p.5, col. 6). 5) Bark "Kallisto" (coming to New York from Rio de Janeiro and Pernambuco) encountered a hurricane at lat. 25 N., long. 55 W. on Sept. 15 (The New York Times, Sept. 18, 1869, p.8, col.6). 6) Bark "Belvidere" reported spoke brig "Messange" (from St. Pierre- Miquelon Is. to Martinique) which was dismasted by a cyclone 200 miles E. of Bermuda on Sept. 16 (The New York Times, Oct. 8, 1869, p.8, col.6). 7) Bark "Florence" arrived at St. Thomas on Sept. 25 and had a severe hurricane at lat. 28 N., long. 57 08 W. on Sept. 16 (The New York Times, Oct. 21, 1869, p.8, col.5). 8) Bark "Dos Hermanos" (Spanish) left Havana for Belle Isle on Aug. 20. When in lat. 34 40 N., long. 46 35 W. encountered a severe gale. The captain ordered the masts and rigging to be cut away and to throw overboard everything moveable on the deck. The vessel arrived in St. Thomas on Oct. 3 (The Times, London, Oct. 29, 1869, p.8, col.4). Author's note: The longitude is probably west of San Fernando; add about 6 degrees to convert to Greenwich. No date was given for the gale-bark encounter, but a time around Sept. 17-18 appears reasonable. 9) Bark "Europa" experienced a heavy gale from N.N.E. at lat. 37 17 N., long. 51 57 W. on Sept. 18 (THE New York Times, Oct. 14, 1869, p.10, col.5).

The hurricane status of Storm 7, 1869 is fully supported by the information above, specially by the barometer reading of 28.90 inches reported by the "Tasmania" (item 4).

Storm 8, 1869 (Sept. 14).

This is the sixth new storm that the author of this study has documented for 1869.

Documentation of the storm was based on the following information: Bark "Crescent Wave" experienced a furious gale from N.E. to S. at lat. 16 N., long. 43 W. on Sept. 14, lasting for 24 hours and being accompanied by a deluge of rain and heavy lightning (The New York Times, Oct. 4, 1869, p.8, col.4).

This storm appears to have been at least 600 miles towards the east of Storm 7, 1869 on Sept. 14. Storm 8, 1869 probably remained to the east of Storm 7, 1869 at all times, but no additional information was found about it. However, it is possible but very far from being conclusive that a gale from S.W. to N.W. that affected the brig "Minnie A. Smith" at lat. 41 N., long. 33 W. on Sept. 18 and which increased to a hurricane (The New York Times, Oct. 13, 1869, p.8, col.6) might have been related to Storm 8. 1869.

No track has been prepared for this storm but it has been placed near 16 degrees North, 43 degrees West on Sept. 14 (Fig. 5).

Storm 9, 1869 (Oct. 1).

This is the seventh new storm that the author of this study has documented for 1869.

Documentation of the storm was based on the following information: Brig "Jenny" (from Puerto Cabello, Venezuela, Sept. 26). Oct. 1, lat. 17 N., long. 67 30 E., had a revolving gale, lasting 3 days; no damage was received (The New York Times, Oct. 26, 1869, p.8, col.5).

No additional information has been found about this storm which apparently did not affect directly the Caribbean islands.

Storm 9, 1869 is shown near 17 degrees North, 67.5 degrees West on Oct. 1 (Fig. 5).

Storm 10, 1869 ( Oct. 4).

This storm has not been mentioned by Tannehill (1938). However, Ludlum (1963) has mentioned this storm and has called it the Saxby's gale because Lt. S. M. Saxby of the Royal Navy had predicted in November 1868 that the Earth would be visited by a storm of unusual violence accompanied with a tide at 7 A.M. Oct. 5, 1869. The author of this study has produced the track for Storm 10, 1869 which is displayed in Fig. 5.

The following information helped in the study of the storm: 1) Schr. "Village Belle" (coming to New York from Inagua) experienced a S.E. to N.W. hurricane at lat. 31 55 N., long. 74 54 W. on Oct. 4, lasting for 15 hours (The New York Times, Oct. 22, 1869, p.8, col.5). 2) Bark "Belvidere". Experienced a cyclone at lat. 39 30 N., long. 72 W. on Oct. 4; wind S.E., E., N. and N.E., lasting 12 hours (The New York Times, Oct. 8, 1869, p.8, col.5). 3) Bark "Helene". Oct. 4, off Montauk, experienced a hurricane from S.E. to S.W. lasting for 15 hours (The New York Times, Oct. 8, 1869, p.8, col.5). 4) Ship "Fawn" encountered a violent S. gale at lat. 41 N.,

long. 67 W. on Oct. 4 (The New York Times, Oct. 13, 1869, p.8, col.6). 5) Brig "Warren" had a heavy S.S.E. gale between Halifax and Cape Sable on Oct. 4 (The New York Times, Oct. 14, 1869, p.8, col.5). 6) Ship "Graham Polly". Oct. 4, lat. 41 N., long. 68 18 W., encountered a hurricane from S.E. to S.W.; at 8:30 P.M. was boarded by two immense seas (Ludlum, 1963). 7) At Nantucket Island, the newspaper Nantucket Inquirer informed that the barometer fell to 28.70 inches at 3 P.M. Oct. 4 when the wind veered from from S.E. to S.W. (Ludlum, 1963). 8) At Gardiner (which is about 50 miles N.E. of Portland, Me.), the barometer dropped to 28.99 inches around 7 P.M. Oct. 4 with the wind veering from S.E. to S.W. (Ludlum, 1963). 9) The Saxby's storm bypassed Halifax but localities on the western shores of Nova Scotia and also in N.E. Maine and New Brunswick suffered the combination of hurricane force winds and tides. The observer at St. John, where the St. John River meets Bay of Fundy, described the following events: 5 P.M. Oct. 4, wind increasing to gale; 6 P.M., rain began to fall; 8:30 P.M., blowing a hurricane from S. by E.; 9 P.M., wind reached maximum force, rain almost ceased; 10 P.M., wind began to subside and shifted to S.W. Moncton, near the north end of Bay of Fundy, experienced a tide 6 feet above any previous record (Ludlum, 1963).

It should be mentioned that, although perhaps it happened just by chance, the time of occurrence of the hurricane winds and high tides in the Nova Scotia area differed only by a few hours from the prediction Lt. Saxby had made in November 1868.

Storm 10, 1869 was found to have moved in a general direction towards the N.N.E. during Oct. 4, 1869 and to have been accompanied by winds of hurricane intensity. The 28.70 inches lowest pressure reported at Nantucket Island fully supports hurricane status.