

Tannehill(1938) has listed two storms for 1867 and Ludlum (1963) has mentioned a third one which was not listed by Tannehill (1938). The author of this study has recently documented five additional storms, making the total number of known storms for 1867 to have increased from 3 to 8. Percentagewise, this represents a 167 percent increase.

Storm 1, 1867 (Jul. 28- Aug. 3).

Ludlum (1963) has mentioned this storm as having occurred offshore New England on Aug. 2 and 3. However, the author of this study has documented the storm as early as Jul. 28 and has prepared the track which is shown in Fig. 3.

The following information was considered in documenting the early stages of the storm: 1) Bark "St. Ursula" (from Rio de Janeiro in 37 days). Jul. 28, lat. 19 N., long. 59 W., had a tail end of a hurricane from N.W. to E.N.E.; sustained no damage (The New York Times, Aug. 12, 1867, p.8, col.7). 2) H.M.S. "Doris" experienced a storm at St. Kitts on Jul. 28-29 (The Times, London, Nov. 23, 1867, p.10, col.1-3). 3) The tail of a hurricane has passed over the islands of St. Kitts, Antigua and Dominica (The Times, London, Sept. 16, 1867, p.8, col.6).

Estimated positions for Storm 1, 1867 at 7 A.M. Jul. 28 and at 7 A.M. Jul. 29 were based upon the information above, particularly on items 1) and 2). Item 3) was not used because the day the event occurred has not been specified and there is still a slight possibility that the alleged event might have not been related to this storm.

Positions for the storm on Jul. 30 and 31 resulted from interpolation along a smooth curve to the next estimated position near 32 degrees North, 76.5 degrees West for 7 A.M. Aug. 1, which was based on the following information: Bark "Cienfuegos". Aug. 1, lat. 32 48 N., long. 76 36 W., had a hurricane beginnig from E.S.E. veering to N.E. and so around to W. (The New York Times, Aug. 10, 1867, p.8, col.6). Because a report of an E.S.E. gale encountered by the bark "Leander" at lat. 34 N., long. 71 W. on Jul. 30 (The New York Times, Aug. 13, 1867, p.8, col.7) was suspected to be in error and, therefore, not found useful for track purposes, there was no alternative to the use of the two-day interpolation scheme just described.

Abundant information on the storm was available for Aug. 2. The following information has been extracted from Ludlum (1963): A ship encountered the blow about 140 miles E. of Norfolk at 2 A.M. Aug. 2. Barometer 2 hours later: 28.60 inches. By 10 A.M. the worst was over and the wind had hauled to N.W. The brig "Chanticleer", off lower Delaware coast, had a heavy S.E. gale at 4 A.M. Aug. 2, which increased to a hurricane at 8 A.M. After noon, the wind gradually went to S. and then to W., moderating by 2 P.M. The "Oak Ridge" passed directly through the center of the storm about 2:30 P.M. She had first a blow from E.S.E., then almost calm and finally a W. wind. The ship foundered about 4 P.M. Aug. 2. Another ship just S. of Montauk Point had hurricane force winds for 3 hours; the

barometer fell 0.40 inches in 90 minutes. The station at Moriches, 50 miles W. of Montauk Point, reported that the wind veered from N.E. to N.W. at 3 P.M. and blew force 4 and 5 (13 to 24 miles per hour). Barometer at New Bedford went down to only 29.70 inches and in New York went down to 29.99 inches. Nantucket got the blow in the afternoon and evening of Aug. 2 and many disabled vessels came into port there over the next few days.

The following marine information about Storm 1, 1867 for Aug. 2 is published in newspapers: 1) Steamship "Fah-Kee", from New York to Nuevitas and Santiago de Cuba, returned to New York this morning. Weather was pleasant to Aug. 1 in the evening when it began blowing a fresh wind from S.E. At midnight, a perfect gale; at 2 A.M. Aug. 2, blowing a hurricane, barometer 29 inches with tremendous seas from S.E.; at 4 A.M., sea making a clean breach over the ship, barometer 28.60 inches; at 7 A.M., wind hauled to N.W. and blew a gale; at 10 A.M., the gale abated a little. The ship was at lat. 36 40 N., long. 73 50 W. when the gale first commenced (The New York Times, Aug. 6, 1867, p.8, col.7). Author's note: This is one of the ships Ludlum (1963) has referred to. 2) Bark "Josie Nichols", at lat. 36 10 N., long. 72 10 W., had a hurricane from W. on Aug. 2, going from New York to Turks Is. (The New York Times, Sept. 17, 1867, p.8, col.7). 3) Brig "Gipsey" (coming to New York from St. Croix). On Aug. 2, had a hurricane which lasted from 7 A.M. to 3 P.M., commencing from S.E. and veering around to E., N.E. and N.W. with high seas (The New York Times, Aug. 6, 1867, p.8, col.7). 4) Schr. "C. A. Farnsworth". Aug. 2, lat. 25 N. (it should read 35 N.), long. 72 30 W., had a hurricane from S.S.E. to S.W. which lasted 8 hours, and shipped a heavy sea (The New York Times, Aug. 8, 1867, p.8, col.7). 5) Bark "Antelope". Aug. 2, lat. 36 N., long. 72 30 W., had a hurricane from S.S.E. to N.E. to N.W. with tremendous seas (The New York Times, Aug. 9, 1867, p.8, col.7). 6) Bark "Trinclou" experienced a hurricane arising from S.E. winds off Bermuda on Aug. 2 (The New York Times, Aug. 9, 1867, p.8, col.7). 7) Revenue cutter "Nehama", lat. 35 N., long. 74 30 W., experienced a heavy gale from E.S.E., increasing to a hurricane (The New York Times, Aug. 9, 1867, p.8, col.7). 8) Brig "Andes" took a hurricane at lat. 36 25 N., long. 74 30 W.; wind changing from S.E. to N.E.; she was hove for 4 hours under storm-try sails (The New York Times, Aug. 10, 1867, p.8, col.7). 9) Brig "Petrel". In the hurricane of Aug. 2, carried away foremast head with everything above it, shifted cargo and sprung a leak (The New York Times, Aug. 11, 1867, p.8, col.7). 10) Brig "Zegri". In the gale of Aug. 2, was knocked over her beam ends (The New York Times, Aug. 11, 1867, p.8, col.7). 11) Schr. "Superb". In the gale of Aug. 2, lost fore and maintop masts and jibboom, stove bulwarks and rail (The New York Times, Aug. 11, 1867, p.8, col.7). 12) Brig "Chanticleer". Aug. 2, lat. 37 30 N., long. 72 40 W., had a very heavy gale commencing from S.E. at 4 A.M. and gaining in violence until 8 A.M. when it was at its height. It blew a perfect hurricane for 4 hours and the vessel lay on her beam ends. From S.W. (?), the gale went gradually to S. and so around to W., when about 2 P.M. it abated (The New York Times, Aug. 18, 1867, p.8, col.7). Author's note: The "Chanticleer" is one of the vessels Ludlum (1963) has referred to; S.W. is obviously a typographic

error which should read S.E. 13) Big "Emilie". Aug. 2, lat. 37 57 N., long. 74 29 W., had a hurricane from S.E. to W. (The New York Times, Aug. 7, 1867, p.8, col.7). Author's note: The wind directions are apparently wrong. 14) Brig "Helena". Aug. 2, Sandy Hook being 185 miles N.W., had a hurricane from S.E. by S. to W. (The New York Times, Aug. 7, 1867, p.8, col.7). 15) Brig "Angostura". Aug. 2, in a hurricane from S.E., shipped a heavy sea (The New York Times, Aug. 7, 1867, p.8, col.7). 16) Bark "Fannie". Aug. 2, lat. 3 (it should probably read 38) N., long. 74 W., had a hurricane commencing from S.E. and veering around to N.W. with terrific force (The New York Times, Aug. 8, 1867, p.8, col.7). Author's note: The S.E. direction appears to be doubtful. 17) Ship "John Chism". Aug. 2, lat. 38 30 N., long. 72 50 W., had a hurricane from S.E. to S. to W., shipping a heavy sea (The New York Times, Aug. 7, 1867, p.8, col.7). 18) Message from Boston, Aug. 7. Bark "Eva H. Fisk" put into this harbor for repairs, having encountered a terrific gale on Aug. 2 at lat. 39 N., long. 71 W., in which the vessel was hove on her beam ends (The New York Times, Aug. 8, 1867, p.1, col.7). 19) Bark "Marco Polo". Aug. 2, had a hurricane from S.E. to S.S.E. but received no damage. The bark "Oak Ridge" foundered in the hurricane and Geo. W. Ginn, the captain and only survivor, was found and picked up from a raft on Aug. 5 (The New York Times, Aug. 8, 1867, p.8, col.7). Author's note: The "Oak Ridge" is one of the vessels Ludlum (1963) has referred to. 20) Report of pilot boat "Isaac Webb" at lat. 40 30 N., long. 72 W. on Aug. 2. Hurricane from E. veering around to W. The heaviest part of the gale lasted 3 hours; the barometer fell 0.40 inches in one hour and a half. (The New York Times, Aug. 5, 1867, p.8, col. 7). Author's note: Without identifying her by name, the "Isaac Webb" is one of the vessels Ludlum (1863) has referred to. 21) Ship "Fleetwing", off Barnegat, had a heavy blow from E.N.E. for 3 days (The New York Times, Aug. 4, 1867, p.8, col.7). 22) Bark "E. Miller". Aug. 2, Barnegat being N.W. by N. 70 miles, had a heavy E. gale which shifted suddenly to N., accompanied by a tremendous sea (The New York Times, Aug. 6, 1867, p.8, col.7). 23) Steamship "Pioneer" (from Cow Bay, Cape Breton Island, Nova Scotia, in 5 days). Aug. 2, off South Shoals, encountered a hurricane beginning from E.S.E. and going around S. and W.S.W., which lasted 4 hours and blew with great violence (The New York Times, Aug. 5, 1867, p.8, col.7). 24) Bark "Persia". Aug. 2, Nantucket South Shoals being N.W. 20 miles, had a heavy blow from S. with tremendous seas (The New York Times, Aug. 7, 1867, p.8, col.7). 25) Ship "Villafranca". Aug. 2, 25 miles W. of Nantucket Lighthouse, had a heavy gale from E.S.E. which lasted 4 hours, then shifted to W. and blew fresh. During the first 2 hours, the barometer fell from 29.80 to 28.80 inches (The New York Times, Aug. 8, 1867, p.8, col.7). 26) Bark "Halcyon". Aug.2, Nantucket South Shoals being N.N.W. 30 miles, had a heavy gale from E.S.E. to S.W. (The New York Times, Aug. 8, 1867, p.8, col.7). 27) Bark "G. S. Brown". Aug.2, lat. 40 30 N., long. 69 57 W., had a hurricane from E.S.E. to W.N.W. which lasted for 8 hours, accompanied by heavy seas (The New York Times, Aug. 8, 1867, p.8, col.7). 28) Brig "S. B. Crosby" (from Cow Bay in 12 days). Had the gale of Aug. 2, in which shifted cargo and split sails. Aug. 4, lat. 42 30 N., long 63 20 W., saw a schooner with

mainmast gone and apparently no sails (The New York Times, Aug 15, 1867, p.8, col.7). Author's note: The "S. B. Crosby" should have experienced the gale off Cape Breton Island quite late on Aug. 2 and it might have lasted until the early morning hours of Aug. 3.

The storm could not be definitely traced beyond near 44 degrees North, 58 degrees West where it is estimated to have been in the morning of Aug. 3. Storm 1, 1867 might have been absorbed by a powerful extratropical storm located farther to the east, whose existence is supported by the following information: 1) Steamship "Weser". Aug. 3 and 4, experienced a hurricane from S.W. to N.W. at lat. 50 N., long. 38 W., with a tremendous high sea (The New York Times, Aug. 11, 1867, p.8, col.7). 2) Ship "Teutonia". Aug. 4 and 5, lat. 53 47 N., long. 30 39 W., had a hurricane from W.S.W. to N.W. with a terrific sea (The New York Times, Aug. 15, 1867, p.8, col.7).

Barometer readings from 28.60 to 28.80 inches which were reported by vessels confirm that Storm 1, 1867 was a fully developed hurricane.

Storm 2, 1867 (Aug. 12).

This storm had not been mentioned by any author before and its documentation was based on the following information: Brig "Suwanee" (coming to New York from Savanilla and Cartagena, Colombia). Had a severe hurricane at lat. 14 N., long. 77 W. on Aug. 12; lost cutwater, with part of the head, and strained the vessel badly (The New York Times, Aug. 24, 1867, p.8, col.7).

No additional information has been found for Storm 2, 1867 which has been displayed near 14 degrees North, 77 degrees West in Fig. 3.

Storm 3, 1867 (Aug. 31- Sept. 3).

This is another storm case which has been recently documented by the author of this study and that has not been on record before.

The following information helped one in studying Storm 3, 1867: 1) Ship "Helen R. Cooper" (from Havana to London) was spoken at lat. 36 N., long. 89 (?) W. on Sept. 7. The ship had experienced a hurricane on Aug. 31, lost sails and shifted cargo (The New York Times, Sept. 15, 1867, p.8, col.7). Author's note: The longitude is obviously in error but this is an unimportant point. 2) Message from Fortress Monroe, Sept. 10. Ship "Grenada" entered this harbor towing the Haitian corvette "Alexandre Petien" which encountered a heavy gale lasting 2 days when she was off Bermuda on Sept. 1 (The New York Times, Sept. 11, 1867, p.8, col.7). 3) Ship "Southampton" (from London in 43 days). Sept. 1, had a very heavy gale from S.E. to N.W. (The New York Times, Sept. 8, 1867, p.8, col.7). 4) Bark "Kosmos" experienced a heavy blow off George's Shoals on Sept. 1 (The New York Times, Sept. 7, 1867, p.8, col.5). Author's note: He believes that the blow should have occurred on Sept. 2 rather than on Sept. 1. 5) Bark "Union", lat. 41 13 N., long. 67 W., experienced a heavy gale from S.S.W. on Sept. 2, which lasted for 6 hours (The New York Times, Sept. 7, 1867, p.8, col.5). 6) Bark "Lady Franklin" had a heavy gale at lat. 42 45 N., long 64 10 W. on

Sept. 3. It blew from S.S.E. for 4 hours, then suddenly shifted to N.W. blowing for 3 more hours with a tremendous sea (The New York Times, Sept. 10, 1867, p.8, col.7). 7) Bark "Wilhelm" had very heavy gales east of the Banks (The New York Times, Sept. 27, 1867, p.8, col.7).

Although all of the items above were considered, the track for Storm 3, 1867 which is shown in Fig. 3 was based on estimated positions which were inferred mostly on the basis of information in items 1), 2), 5) and 6).

Storm 4, 1867 (Sept. 8).

This is the third new case that the author of this study has documented for 1867. Documentation of this storm was based on the following information: Schr. "Matilda", lat. 17 N., long. 58 W., had a heavy gale on Sept. 8 (The New York Times, Sept. 29, 1867, p.8, col.7).

No additional information has been found for this case and, consequently, no track has been attempted for this storm. Storm 4, 1867 has been indicated in Fig. 3 as having occurred near 17 degrees North, 58 degrees West, about 200 miles east of the Leeward Islands, on Sept. 8.

Storm 5, 1867 (Sept. 29-30).

This is the fourth storm that the author of this study has newly documented for 1867. A track for the storm is displayed in Fig. 3.

Information published in newspapers was crucial in documenting this storm. The following information was considered for that purpose: 1) Schr. "Josephine B. Small" (from Sisal, Mexico, in 25 days). Had a heavy gale on Sept. 29; while hove to, split storm-try sail, etc. (The New York Times, Oct. 11, 1867, p.8, col.6). 2) Brig "Gen. Marshall". Had a gale on Sept. 29, coming to New York from Turks Is. in 19 days (The New York Times, Oct. 11, 1867, p.8, col.6). 3) Schr. "E. A. De Hart" (from St. Martin, via Fortress Monroe, in 25 days). Sept. 29, had a heavy gale from E.S.E. to N.; was thrown on her beam ends (The New York Times, Oct. 14, 1867, p.8, col.7). 4) Bark "New Light" (from Baltimore to Rio de Janeiro) was spoken on Oct. 3. The vessel was in a hurricane on Sept. 29; lost fore and maintop sails (The New York Times, Oct. 15, 1867, p.8, col.6). 5) Brig "Juliet C. Clark" (coming to New York from Nuevitas and Remedios, Cuba). Sept. 29, lat. 33 36 N., long. 76 W., had a heavy N.E. gale (The New York Times, Oct. 15, 1867, p.8, col.6). 6) Brig "Julia" experienced a terrific hurricane at lat. 35 35 N., long. 73 36 W. on Sept. 30. The vessel, which was coming to New York from Demerara (Guyana), was on her beam ends for 2 hours and sprung a leak (The New York Times, Oct. 9, 1867, p.8, col.6). 7) Brig "Salinas". Sept. 30, lat. 35 20 N., long. 74 W. Had a heavy gale from E. to N.W. which lasted 7 hours with great violence; was hove to on her beam ends twice and strained vessel badly (The New York Times, Oct. 4, 1867, p.8, col.6). 8) Steamship "Corsica" reports that the brigantine "Blonde" from New York for Veracruz, experienced a hurricane from S.S.E. on Sept. 30, then suddenly

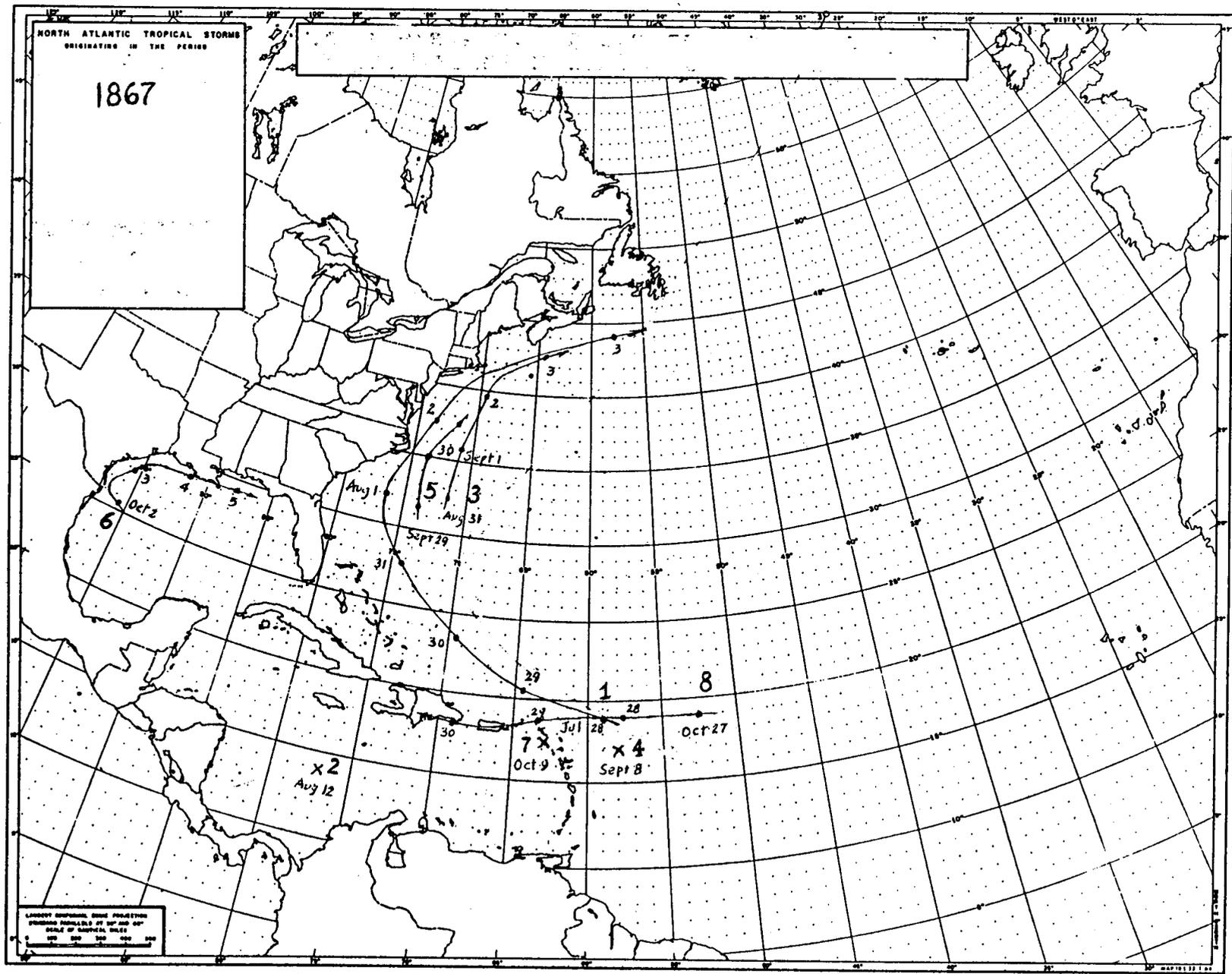


Fig. 3

shifting to N.N.W. at 2 P.M.; at 4 P.M. a sea boarded her up; the vessel hove on her beam ends and bore for Nassau on Oct. 1 (The New York Times, Oct. 29, 1867, p.8, col.6).

Although all of the items above contributed to determine the track shown in Fig. 3, the heaviest weight was given to items 5), 6) and 7) in estimating morning positions for the storm on Sept. 29 and 30. Storm 5, 1867 could not be definitely tracked after Sept. 30 and it is believed to have merged with an extratropical cyclone located at much higher latitude to the north and northeast of Storm 5, 1867, and whose existence was supported by the following report: Ship "Adelaide" had a S.S.W. gale at lat. 43 28 N., long. 60 48 W. on Sept. 30 (The New York Times, Oct. 9, 1867, p.8, col.6).

Indications are that Storm 5, 1867 attained hurricane intensity.

Storm 6, 1867 (Oct. 2-5).

Tannehill (1938) has listed this storm and Dunn and Miller (1960) and Ludlum (1963) have referred to the storm as well. The author of this study has prepared the track for Storm 6, 1867 which is displayed in Fig. 3.

The track for this storm was started on Oct. 2 and the storm is shown to have moved northwestward towards the Brownsville area and then towards the northeast and east.

The following information was found about the storm in the vicinity of Brownsville: 1) W. Armstrong Price, in his study of hurricanes affecting the Texas coast, stated that the towns of Bagdad in Mexico and Clarville in Texas, near the mouth of the Rio Grande River, were destroyed by the hurricane (Ludlum, 1963). Author's note: Although it was not specifically stated, the storm should have occurred there on Oct. 2. 2) From Brownsville Courier: On the 7th of the present month (October), a refreshing norther which sprung up about 8 A.M. continued with violence until 9 P.M. when it assumed rotating motion standing fearfully from N.N.E. There is no inhabitation that had not felt the terrible force of the storm and the majority of the business houses are in ruin. Two schooners sunk and other vessels had their upper works and cabin destroyed (The Times, London, Nov. 7, 1867, p.2, col.3). Author's note: The date of Oct. 7 apparently resulted from a typographic error; it should read Oct. 2. 3) A report in The New Orleans Picayune indicates a hurricane near the Mexican-American border with 25 deaths in Matamoros, 12 in Brazos and 10 in Brownsville (The Times, London, Nov. 12, 1867, p.5, col. 3). 4) Message from New Orleans, Oct. 7, indicating that the schooner "Kodash" sunk at Brazos harbor during the storm (The New York Times, Oct. 8, 1867, p.5, col.3).

The following information was found about the storm in the vicinity of Galveston: 1) From a narrative produced by Prof. C. G. Forshey and published in Galveston News: At 7 A.M. Oct. 3, the wind at Galveston was 15 degrees N. of E. and the barometer was at 30 inches. At 12:15 P.M., fury increases, barometer 29 inches, and wind blowing from N. 60 degrees E. At 3:30 P.M., wind due N., no rain but dark and wind furious. At 5 P.M., N. wind, still violent and hot. At 8 P.M., storm slightly abating, wind still N.N.E. At 9

and 10 P.M., wind subsiding a little but not changing course much. During the whole day of Oct. 4, the wind was N. and N.N.W. gentle (Ludlum, 1963). 2) Message from New Orleans, Oct. 7. The evening papers have accounts of tremendous gales at Galveston on Thursday (Oct. 3), estimating damages to wharves, shipping, goods and buildings at a million dollars. The water spread entirely across the island. The steamer "Elizabeth Reed" is high and dry near the railroad. The steamer "Alice M." was wrecked and completely submerged. A brig was driven completely through William's Wharf and several schooners sunk (The New York Times, Oct. 8, 1867, p.5, col.3). 3) From Galveston News, Oct. 4. About 5 o'clock Thursday (Oct. 3), the wind started to increase accompanied by rain. From that time the water began to rise and overflow the island. The lower floors of the stores on Strand were 2 to 4 feet under water at noon. The wharves were submerged by the waves at noon and ore and vessels tied to them were chafed and damaged, the bay being very rough (The New York Times, Oct. 14, p.8, col.2).

The following information was found about the storm in the vicinity of New Orleans: 1) New Orleans felt the gale on Oct. 4. Wind continued to increase until 4:30 P.M. when it blew a heavy gale accompanied by torrents of rain. Towards sunrise Oct. 5, the gale abated. The highest wind came from E.N.E. when the center passed to the south near the coast. The lighthouse in Southwest Pass (Mississippi delta) was almost completely destroyed by the wind and six houses were destroyed at Pilottown (Ludlum, 1963). 2) Message from New Orleans, Oct. 7. The storm was heavy in the mouth of the Mississippi River. The ship "Merchant" was blown ashore about the Head Passes and a Spanish bark is also ashore at the same place. The tow-boat "Heroine" sunk inside the bar at Southwest Pass (The New York Times, Oct. 8, 1867, p.5, col.3). 3) From The New Orleans Times, Oct. 8. It is feared that plantations on the bank of the Mississippi River in the parishes of Plaquemines and St. Bernard have been overflowed and crops damaged. In Baliza (Pilottown) telegraph is not in working order, so the extent of damages at the Passes is not known (The New York Times, Oct. 14, 1867, p.8, col.2).

The track for Storm 6, 1867 (Fig. 3) was stopped on Oct. 5. However, indications are that the storm continued eastward, probably gradually becoming extratropical and moving along a front trailing from an intense extratropical cyclone that developed off the Carolina coast on Oct. 5 and whose existence was documented by the following information: 1) Brig "Annie M. Young" (coming to New York from Cienfuegos). Had a N.N.E. to N.N.W. gale on Oct. 5 (The New York Times, Oct. 11, 1867, p.8, col.6). 2) Steamship "Wilmington", at lat. 35 10 N., long. 74 54 W., experienced a hurricane from S.S.W. to N. on Oct. 5 at night and in the morning of Oct. 6 (The New York Times, Oct. 12, 1867, p.8, col.6). 3) Brig "O. C. Clary" had a heavy N.N.E. to N.N.W. gale off Hatteras on Oct. 5 (The New York Times, Oct. 13, 1867, p.8, col.6).

The author believes that the following gales were probably related to the weakening extratropical system which resulted from Storm 6, 1867: 1) Schr. "Alfred Keese" had a heavy gale off Cape Canaveral on Oct. 8 (The New York Times, Oct. 17, 1867, p.8, col.7). 2) Brig "Gipsey" (from Turks Is. in 11 days). Oct. 9, lat.

29 N, long. 73 40 W., had a heavy N.E. gale with heavy seas (The New York Times, Oct. 15, 1865, p.8, col.6). 3) Schr. "J. P. Augur" (from St. Kitts in 24 days). After a gale, a heavy sea carried away head of mainmast at lat. 34 N., long. 74 W. on Oct. 9 (The New York Times, Oct. 15, 1867, p.8, col.6).

Storm 7, 1867 (Oct. 9).

This is the fifth storm that the author of this study has recently contributed to the storm current knowledge for 1867. The storm was documented after examining the following information: Brig. "Mary C. Mariner" (from St. Martin, Oct. 19) reported that the schooner "Three Sisters", from Grenada to New York, was wrecked at St. Martin in a gale on the night of Oct. 9 (The New York Times, Nov. 4, 1867, p.8, col.4). The gale mentioned as having occurred at St. Martin during the night of Oct. 9 does not appear to have been an isolated weather event in the eastern Caribbean and it is suspected to have been related to these two other weather events which were published in newspapers: 1) Seven inches of rain fell in the night of Oct. 7 at the island of Barbados (The Times, London, Nov. 23, 1867, p.10, col.1-3) and 2) A severe hurricane was experienced in Puerto Rico on Oct. 13. A number of coasting vessels were lost and others were seriously damaged and the rivers were overflowed (The New York Times, Oct. 30, 1867, p.1, col.1). It would make sense to relate the gale experienced at St. Martin in the night of Oct. 9 with the same weather system which produced the very heavy rainfall at Barbados on the night of Oct. 7. However, it would be difficult to establish a relationship between the alleged hurricane in Puerto Rico on Oct. 13 and the gale reported at St. Martin four days earlier. Because Salivia (1972) has listed the famous "San Narciso" (Oct. 29) as the only hurricane having affected Puerto Rico in 1867, the author of the present study strongly believes that no hurricane visited that island on Oct. 13 and that the wrecks and flooding reported to have occurred there resulted from a very weak storm. If it were the same system which produced the gale at St. Martin, such a system would have moved at an extremely low pace. However, it is still possible that the Oct. 13 date is in error and that the wrecks and floods in Puerto Rico might have occurred two or three days earlier, allowing for a smooth continuity of the weather events reported from Barbados, St. Martin and Puerto Rico.

Because the above discussion is full of speculations, the author of this study decided against preparing a track for Storm 7, 1867 and in favor of just placing it near St. Martin on Oct. 9 (Fig. 3). He believes that the storm was fairly weak.

Storm 8, 1867 (Oct. 27-30).

This is the well-known hurricane which is remembered in Puerto Rico as "San Narciso" because the storm occurred there on Oct. 29, the day the Catholic Church observes the festivity of that saint. Tannehill (1938), Garriott (1900), Alexander (1902), Salivia (1972) and Garcia-Bonnely (1958) have referred to this storm before. The author of this study has prepared the track for Storm 8, 1867 which

is displayed in Fig. 3.

The storm track was started on Oct. 27 on the basis that Salivia (1972), quoting the Gaceta de Puerto Rico, has stated that the mail steamer "Principe Alfonso" skillfully avoided the storm two days before it affected Puerto Rico and that the tropical cyclone formed between 18 and 20 degrees North and 50 and 55 degrees West. In compliance with the above information, the author estimated Storm 8, 1867 to have been not very far from 19 degrees North, 52.5 degrees West in the morning of Oct. 27.

The hurricane reached the small island of Sombrero in the northern Leeward Islands in the morning of Oct. 29. However, indirect effects of the storm were also felt by two ships at sea far away from the storm core: The Royal Mail steamer "Douro", outbound from England to St. Thomas and being away some 250 miles from the latter island, experienced a heavy swell and a southerly set on Oct. 29, and the H.M.S. "Doris", off Guadeloupe, had a heavy N. swell but nothing else (The Times, London, Nov. 23, 1867, p.10, col.1-3).

Salivia (1972) has quoted J. R. Eastman of the U.S. Navy in his report "Discussion of the West Indian Cyclone of Oct. 29 and 30, 1867" as having stated that the storm started at Sombrero Island at 6 A.M. Oct. 29 and abated at 11 A.M. An interesting letter from R. H. Twigg, who was engaged in the erection of a lighthouse at Sombrero Island, gave additional information about the hurricane in that place. According to R. H. Twigg's letter (The Times, London, Dec. 10, 1867, p.10, col.6), the hurricane commenced at Sombrero at 1 A.M. from the N.E., and that at 5:30 A.M. it was blowing hard from N.W. By 8 A.M. the barometer had fallen to 28.65 inches and the wind veered around to N. There was a lull for half an hour, but the storm continued with even greater than its previous violence from E. until 11 A.M. when it had abated enough to allow a few persons to venture out; the wind went around to S.E. and still blew hard for two hours longer.

An account of the storm at Tortola (Virgin Islands) stated that the storm lasted from 11 A.M. Oct. 29 to 3 P.M., but that the greatest fury was from 12 to 2. One third of the miserable tenements of the island was said to have been blown down and there was official information of 22 deaths at Road Town, 2 in nearby Peter Island and 2 in Westland (The Times, London, Nov. 23, 1867, p.12, col.2-3). The Royal Mail steamer "Conway" was struck by the hurricane when going across from Peter Island to Tortola. The sea rose suddenly and the ship was in danger to founder. A lull suddenly came but very soon the blast came back blowing away funnel and mainmast and driving the ship ashore at Tortola (The Times, London, Nov. 23, 1867, p.10, col.1-3).

The following information of meteorological value has been found: 1) The "Conway" had been under the stern of the Royal Mail steamship "Rhone" off Peter Island. By 11 A.M. the barometer had fallen to 27.95 inches and a fearful hurricane was blowing from N.N.W one-half W.. At 12:15 P.M. the wind had lulled. At 12:30 P.M. it was almost calm and the "Rhone" was seen running to seaward. At 12:40 P.M. it was most dark and shortly after the most fearful rush of wind from S.S.E one-half E. set in (The Times, London, Nov. 22, 1867, p.12, col.1). 2) Report from C. Vesey, Royal Navy Captain and

Senior Officer, Barbados Division, North America and West Indies. Royal Mail steamship "Rhone" at 9 A.M., barometer 30.00 inches, wind from S.S.E. Royal Mail steamer "Conway" at 9:30 A.M., barometer 29.30 inches (probably in error). The "Conway" left the "Rhone" at 11:10 A.M., barometer 29.88 inches. At 12:15 P.M., barometer 28.60 inches. Calm came on at 12:30 P.M., barometer 28.10 inches. At 12:50 P.M., wind from S., barometer rising. At 5 P.M., barometer 29.45 inches. Wind before calm came on, N. by W.; after calm, S and by E. Terrific thunder and torrents of rain. The barometer on shore Tortola fell from 29.75 to 29 inches (The Times, London, Nov. 23, 1867, p.10, col.1-3).

Observations in item 1) seem to correspond to the "Conway"; however, observations in item 2) are confusing but they are believed to correspond to the "Conway" as well, unless otherwise noted. It is inferred from items 1) and 2) that the "Conway" and the "Rhone" came mutually visible when the center of the hurricane passed near Peter Island and the "Conway" allegedly saw the "Rhone" running seaward. Indeed, both vessels should have been in the calm area around 12:30 P.M. The barometer reading of 28.10 inches appears to be reasonable but the one of 27.95 inches reported by the "Conway" at 11 A.M. is obviously in error because the pressure outside the center of the hurricane could not have been lower than at the center itself and, in addition, a barometer reading of 29.88 inches was reported at 11:10 A.M. A very sad aspect of the erroneous reading of 27.95 inches is that both Garriott (1900) and Tannehill (1938) have referred to this value as the lowest pressure recorded at St. Thomas during the Oct. 29, 1867 hurricane.

The "Rhone" was wrecked on Salt Island while endeavoring to get out to sea. She was driven on a reef and broke up. The captain and all the officers were lost and only one passenger and 23 of the crew were saved (The Times, London, Nov. 22, 1867, p.12, col.1). Salt Island is located very close to Peter Island and, according to The Times, London, Nov. 23, p.10, col.1-3, the "Rhone" was wrecked on a large boulder with her hull under water and the foremast standing, but the vessel herself broken in two.

Salivia (1972) has referred to the hurricane at St. Thomas indicating that, according to J. R. Eastman, there was a calm there from 1:30 to 2 P.M. with the lowest barometer at 28.50 inches, having the wind blown furiously from the N.W. and later from S.S.E. Tannehill (1938) and Garriott (1900) have also referred to the storm passage over St. Thomas but they have wrongly stated that the barometer fell as low as 27.95 inches just prior to the calm which occurred shortly after noon. Garriott (1900) has mentioned the Nautical Magazine, volume 36, Dec. 1867 as his source and presented practically the same information which is shown in item 1) two paragraphs above in this manuscript. Tannehill (1938) probably took the information from Garriott (1900). The author of this study has found that the 27.95 inches reading allegedly reported by the "Conway" was in error and that the correct central pressure was 28.10 inches when the center of the hurricane moved over the "Conway" and the "Rhone" near Peter Island, which is roughly 20 miles to the east of St. Thomas, at 12:30 P.M. Therefore, it is necessary to allow some time for the storm center to have moved from the vicinity of Peter Island to St. Thomas and, consequently,

the timing between 1:30 and 2 P.M. stated by J. R. Eastman (Salivia, 1972) looks reasonable for the center to have been over the latter place. It should be mentioned that the author of this study found an additional description of the storm passage over St. Thomas, which he carefully considered but that he discarded because it was found to be full of inconsistencies in the alleged timing and characteristics of the meteorological events. That additional description is contained in a letter written by an officer of the Atheneum of St. Thomas which was published in The Times, London, Nov. 23, 1867, p.10, col.1-3.

Concerning damages and loss of life in St. Thomas, the following is extracted from The Times, London, Nov. 7, 1867, p.1, col.2 and 3): Message from Havana, Nov. 6. An official dispatch to the Consul of this city states that St. Thomas is completely in ruins, that the loss of life has been very great and that the destruction of property has been immense. Fifty vessels are ashore. Forty persons are saved from the "Wye", which was lost at Buck Island (a small island located near St Thomas) and the "Derment" is among the vessels which are ashore at St. Thomas. The Times, London, Nov. 8, 1867, p.4, col.1 announced that, in addition, the "Tyre" and the "Solent" have been dismasted and The Times, London, Nov. 13, 1867, p.7, col.5., stated that the steamer "Columbia" sank in 35 feet of water but that the crew and passengers were saved and that the "Robert Todd" was ashore and dismasted. However, The Times, London, Nov.23, 1867, p.12, col.1-3, published that the U.S. steamer "Monongadela" was at St. Croix during the hurricane but did not feel its effects. This latter statement suggests that the size of the storm was fairly small.

After leaving the Virgin Islands, the hurricane made Puerto Rico its next target. According to Salivia (1972), the center of the storm moved over Puerto Rico near Fajardo where the wind was blowing tremendously at 5 P.M. Oct. 29. Quoting from "La memorable noche de San Narciso y temblores de tierra, narracion veridica de todos los acontecimientos ocurridos" by Vicente Fontan y Vera, Salivia (1972) has stated that the barometer reading at San Juan was 29.60 at 6 P.M. and that the strongest part of the storm commenced in that city around 7:15 P.M. The effects of the hurricane were disastrous to shipping at the port. The "Carmen", the "Josefina" and the "Rita" were lost and the brigantine "Joaquin", the frigate "Apolo", the bark "Mary", the pilot's boat "Fe" and other vessels were damaged. Small Public Health and Customs boats sank at 9:30 P.M. when the wind started to blow from the E. and the barometer started to rise; the wind diminished to fresh by 11:30 P.M. The center of the hurricane was over Caguas at 8 P.M., where the wind blew from the N. and after a 10-12 minute calm it shifted to the S.W. And oldest persons living in Barranquitas stated that "San Narciso" was a stronger hurricane than any other affecting that place in very many years. It should be indicated that Caguas is located about 15 miles to the S.S.E. of San Juan whereas Barranquitas is located about 20 miles to the S.S.W. and that Fajardo, Caguas and Barranquitas are roughly aligned along an E.N.E-W.S.W. direction.

Salivia (1972) has also referred to some information about the hurricane in Puerto Rico which appeared in "Discussion of the West

Indian Cyclone of Oct. 29 and 30, 1867" by J. R. Eastman. Some pieces of the information given by Eastman shown to be correct but there are others that are extremely doubtful. For instance, he described the hurricane winds to have been very strong from the W. at Cayey (located a little over 20 miles S. of San Juan) which made lots of sense for the center of the storm having passed just N. of that place. But J. R. Eastman also described the hurricane at San Juan as having started at 8:52 P.M. and lasted for 15 minutes, with the wind having blown first from N.W. and then shifted to W. and S.W., which is by no means the wind behavior expected from the hurricane core having passed to the S. of the city. In addition, he has also described a rather strong wind from the W. at 10 P.M. and nothing else at the town of Arecibo (about 45 miles to the W. of San Juan), which is highly suspected to be erroneous. However, Eastman's ideas that, as a result of interacting with the mountains of Puerto Rico, the hurricane weakened near the surface but remained aloft are plausible, and according to him, the storm reintensified over the Mona Passage where it destroyed several vessels and then continued towards the Dominican Republic.

The following information was found about the storm in the Dominican Republic: The city of Santo Domingo was almost destroyed and 200 persons died in that city on Oct. 30. Many shipping suffered damages (The Times, London, Dec. 4, 1867, p.12, col.2).

The author of this study believes that the storm broke apart over the mountains of Hispaniola on Oct. 30.

Storm 8, 1867 showed an unusual westward motion for a hurricane that late in the season and, in fact, the motion was documented to have been just south of due west on Oct. 29.

The storm was an intense hurricane as suggested by the central pressure of 28.10 inches reported near Peter Island (Virgin Islands). However, the storm size was quite small and estimates of three to four miles for the diameter of the calm area corresponding to the vortex have been mentioned in Puerto Rico (Salivia, 1972).