

Eleven storms were found to have occurred in 1891. Tracks for these storms are presented in Fig. 1.

Storm 1, 1891 (Jul. 3-7), H.

The following information was found in relation to this storm:

- 1) A low area was indicated over the western Gulf of Mexico by reports of Jul. 3 and by the evening of Jul. 4 was apparently central S.E. of the mouth of the Rio Grande River, passing near and west of Galveston during the evening of Jul. 5. At 9:30 P.M. (Eastern time) the barometer read 29.24 inches at Galveston, having fallen 0.38 inch in 90 minutes. Then the barometer rose and the wind shifted suddenly from S.E. to S.W. Low-lying sections of the city were inundated by a storm wave. At Baton Rouge, La., the state penitentiary was wrecked and 10 convicts killed and a number injured; many other houses were destroyed or damaged at the place (Monthly Weather Review, Jul. 1891). Author's note: Damages at Baton Rouge were related to tornado activity associated with the storm.
- 2) Galveston, Jul. 5. This city has been visited by one of the most terrific storms in years. The tempest is still raging. The waters of the Gulf are in the streets and many houses and buildings in the neighborhood are flooded. Telegraph wires are prostrated (The New York Times, Jul. 6, 1891, p.2, col.5). New Orleans, Jul. 5. The Times Democrat's Galveston Special says: As darkness deepened last night, the wind, accompanied with the rains, increased in velocity and by 9 P.M. was blowing at a rate of 36 mph. By 6:15 A.M. today (Jul. 5) it reached a velocity of 40 mph which maintained for 5 minutes. The Signal Service predicts that the worst is not over as the velocity of the wind is now reported by the service at 42 mph and the barometer constantly dropping while the Gulf waters are on the rise (The New York Times, Jul. 6, 1891, p.2, col.5).
- 4) New Orleans, Oct. 6. The cyclone struck Baton Rouge at 6:30 A.M. today (Jul.6), wrecked the steamer tug "Smoky City", demolished 100 houses and blew down the second and third stories of the penitentiary killing 10 convicts and injuring 35. The cyclone whirled from the S.W. It was 300 yards in width and appeared to have jumped over some obstructions and ruthlessly ground others into irrerecognizable debris (The New York Times, Jul. 7, 1891, p.1, col.5). Author's note: Although the word cyclone is mentioned, it is obvious that the effects described in this item corresponds to a hurricane-related tornado and not to the tropical storm winds themselves.
- 5) Storm of Jul. 3-13, 1891. Bay of Campeche, Texas-Louisiana coast (Tannehill, 1938).
- 6) Storm of Jul. 4-5, 1891. Entire Texas coast. Minor. Parts of Galveston inundated (Dunn and Miller, 1960).
- 7) Track showing an 8 P.M. Jul. 4 position near 25 degrees N., 95.5 degrees W. and an 8 P.M. Jul. 5 position near 28.5 degrees N., 95.5 degrees W. (Monthly Weather Review, Jul. 1891).
- 8) The storm was first observed on Jul. 3 at lat. 24 N., long. 94 W. and lasted for 10 days. It recurved at lat. 31 N., long. 94 W. and ended at lat. 41 N., long. 27 W. (Garriott, 1900).

9) Thack extending from the Gulf of Campeche to just N. of the Azores (Mitchell, 1924).

With the exception of the tracks which extended into the eastern Atlantic (items 8 and 9), the information contained in the above items was found to support, in general, the track for Storm 1, 1891 which is displayed in Neumann et al. (1993). Therefore, the author of this study decided to keep such a track unchanged and to reproduce it in Fig. 1.

The hurricane status which is indicated in Neumann et al. (1993) was found to be consistent with the pressure of 29.24 inches reported at Galveston (item 1), which supports minimal hurricane winds.

Storm 2, 1891 (Aug. 17-29), H.

The following information was found about this storm: 1) A storm of tropical or subtropical origin advanced from the S.E. towards Bermuda on Aug. 26 and passed E. of that island on Aug. 27. At 7 A.M. Aug. 27 the wind at Bermuda was N.E. force 6; by 8 A.M. it had shifted to N.W. force 6 and it continued to blow from that point, with heavy rain squalls, until noon, when it shifted to W.N.W., to W. at 3 P.M., to W.S.W. at 6 P.M. and to S.W. at 9 P.M. The barometer fell steadily to 29.60 inches at 12:30 P.M., after which it began to rise. No damage was caused to shipping or buildings at Bermuda. By the morning of Aug. 28 the storm has passed north of the 35 degrees N. parallel, after which it apparently united with a low area which occupied the Gulf of St. Lawrence in the morning of Aug. 29 (Monthly Weather Review, Aug. 1891). 2) Brief telegraphic reports from the West Indies and Bermuda show that the storm E. of the Bahamas moved close to Bermuda, where the wind was N.N.W. at noon Aug. 27 and the barometer fell to 29.44 inches (The New York Times, Sept. 2, 1891, p.8, col.6). 3) The wreck of the grain laden British steamship "Dunsmurry", the vessel which capsized in the hurricane which swept the Atlantic Saturday (Aug. 29), was a subject of comment among the shipping men yesterday (The New York Times, Sept. 3, 1891, p.8, col.4). 4) A Reuter telegram from Halifax, N.S., dated on Sept. 2 stated that the British steamer "Dunsmurry", from New York to Antwerp, capsized during a hurricane on Aug. 29 250 miles from that port and sunk (The Times, London, Sept. 3, 1891, p.5, col.4). 5) The steamer "La Touraine" had a very rough experience coming here (New York) from Le Havre. On Aug. 30 the sky began to look very threatening and the wind began shifting from W.N.W. to S. and increased in velocity very rapidly. The gale continued to blow on Aug. 31, but began to moderate the following day. The steamer had run into the tail of a cyclone that caused terrific seas and made things generally unpleasant for 2 days (The New York Times, Sept. 7, 1891, p.8, col.4). Author's note: The ship's location where the rough weather was encountered is not given; therefore no positions could be inferred for the storm on Aug. 30-31 on the basis of information in this item. 6) Track showing the following morning locations: Aug. 26, lat. 28 N., long. 60 W.; Aug 27, lat. 31.6 N., long. 62.7 W.; Aug. 28, lat. 35.5 N., long. 62.5 W. (Monthly Weather Review, Aug. 1891). 7) Map showing the storm track to have

extended from the region to the S. of the Cape Verde Islands to S. of Nova Scotia (Mitchell, 1924). Author's note: This track is very similar to the one displayed in Neumann et al. (1993).

Except for a minor adjustment in the 7 A.M. Aug. 27 position along the track shown by Neumann et al. (1993), information in the above items was found to support the track just mentioned. The author adjusted the 7 A.M. Aug. 27 position in Neumann et al. (1993) by about 60 miles forward to near 32.3 degrees N., 63.3 degrees W., in order to conform with the wind and pressure evolution at Bermuda which is described in item 1). No other modifications were introduced along the track in spite of that information in item 5) suggests the existence of the storm beyond Aug. 29. It should be mentioned that the acceptance of the track in Neumann et al. (1993) prior to Aug. 26 was based solely on information in item 7) and not on marine data. The author's track for Storm 2, 1891 is displayed in Fig. 1.

The hurricane status which Neumann et al. (1993) indicate for this storm could not be verified by using meteorological information in the above items because no hurricane winds were reported at Bermuda (item 1) and the pressure values of 29.60 inches (item 1) and 29.44 inches (item 2) which were reported at Bermuda are not low enough to decisively support hurricane intensity. Under these circumstances, the hurricane status of Storm 2, 1891 was kept unchanged.

Storm 3, 1891 (Aug. 18-25), H.

The following information was found about this storm: 1) The commander of ship "Esk" reports he sailed from Barbados for St. Lucia at 5:35 P.M. Aug. 17, with N.E. to E.N.E. winds of force 3 to 4 and barometer at 30.17 inches; arrived at St. Lucia at 6 A.M. Aug. 18 with wind E.N.E. force 4 and barometer 30.19 inches; arrived at St. Pierre (Martinique) at 1 P.M. with wind N.N.E. force 4 and barometer 30.10 inches, and left Martinique for Dominica at 2:35 P.M. with wind N.E. force 5 and barometer 30.07 inches. During the passage to Dominica N.E. to E. gales attaining hurricane force, heavy rain, violent squalls and high seas from E.N.E. were experienced and the barometer fell to 29.96 inches from 5 to 6 P.M. At Dominica the gale continued from E.N.E. to E. at force 10 to 11 until midnight when the wind shifted to E.S.E. and from that point to S.E. at 6 A.M. Aug. 19, with slowly rising barometer and wind moderating in force (Monthly Weather Review, Aug. 1891). Author's note: Barometer readings appear to be too high. 2) The night of Aug. 18 one of the most disastrous West Indian hurricanes devastated the island of Martinique. At Martinique the storm continued 4 hours, from 6 to 10 P.M., and the center passed that place between 7 and 8 P.M., travelling in a W.N.W. direction at a speed of about 11 mph. During the day, a fresh N.N.E. breeze had prevailed at Martinique, with rapidly falling barometer and wind increasing in force. The storm struck the east side of the island about 6 P.M. and in its passage over the island the destruction was less complete on the elevated plains. The wind veered from E.N.E. to S.S.E. and was most destructive from the latter point. Incessant lightning, unaccompanied by thunder, continued throughout the storm

and at its conclusion 2 distinct shocks of earthquake occurred at intervals of 5 seconds. There was a record of a self-registering Richard barometer at St. Pierre. Mr. Leon Sully stated that from 8:10 P.M. to 8:40 P.M., this barometer vibrated excessively, but a good aneroid barometer recorded every difference in pressure, and the passage over St. Pierre was clearly marked at 28.98 inches. Other minima were associated with the passage of secondary whirls, a fact that was corroborated on the following day by the appearance of certain broken trees which could not have been bent in the way they were except by a strong giratory movement (Monthly Weather Review, Aug. 1891). 3) Table prepared by Wilhelm Krebs in 1911 showing a pressure as low as 26.85 inches at Morne Rouge, Martinique, during the Aug. 18-19, 1891 hurricane. However, at St. Pierre a self-registering barometer gave a reading of about 28.70 inches. The record showed excessive vibration but a good aneroid read 28.98 inches at the passage of the center. It appears that the reading given by Krebs was probably in error as lack of proper sea-level reduction could scarcely account for the difference (Tannehill, 1938). 4) Washington, Aug. 19. The State Department has received a cablegram from the U.S. Consul in Martinique stating that a hurricane last night destroyed every sail in port. The houses are all damaged and many lives have been lost (The New York Times, Aug. 20, 1891, p.1, col.6). 5) Paris, Aug. 20. Official advices received here this afternoon announce the calamity which has visited Martinique is the most severe since 1817. At Fort de France alone 20 lives were lost. According to a message from Lamentin, received at St. Pierre, 10 persons died there. La Trinite sent a list of 10 dead. All vessels at Martinique were lost. The hurricane burst about 7 P.M., although its approach was felt some time before that hour, and raged furiously for nearly 3 hours (The New York Times, Aug. 21, 1891, p.1, col.5). Author's note: A similar dispatch was published in The Times, London, Aug. 21, 1891, p.5, col.3. 6) Havana. Aug. 20. Father Vines says that the cyclone that has done such great damage at Martinique seems, according to his observations, to have had a small radius. Its forward direction is W.N.W. at a velocity of 15 mph. It has crossed to the S. of St. Thomas and its influence will probably be felt in eastern Cuba tomorrow (The New York Times, Aug. 21, 1891, p.1, col.5). 7) Paris, Aug. 21. Additional details received here from St. Pierre this morning show that the facts already published are not only in no way exaggerated but that they did not tell the full history of the disaster. The last report received here indicated that 218 people were found dead in the coast towns alone, the towns in the interior not having heard from as yet (The New York Times, Aug. 22, 1891, p.1, col.2). Author's note: A similar dispatch was published in The Times, London, Aug. 20, 1891, p.5, col.2. 8) St. Pierre, Aug. 22. On Friday (Aug. 20) the death toll had amounted to 218, today it is known that 250 are dead. The village of Morne Rouge is a total wreck. The loss of life there was about 30. Hardly had the terrific storm died away when a sharp earthquake shock added to the terror of the night (The New York Times, Aug. 23, 1891, p.6, col.5). Author's note: A similar dispatch dated at New York on Aug. 22 and published in The Times, London, Aug. 24, 1891, p.3, col.3, added that Fort de France was almost entirely destroyed. 9) Paris, Aug.

24. The latest advices from Martinique say that 340 persons perished in the recent hurricane, without counting the shipwreck fatalities (The New York Times, Aug. 25, 1891, p.5, col.6). The steamer "Cuvier", which arrived at New York yesterday from the West Indies, had a narrow escape from the hurricane which devastated Martinique. The "Cuvier" called at the little island of St. Lucia for coal and, after filling up, proceeded to this port. The island is about 20 miles from Martinique and was passed at 2 P.M. Less than 5 hours after passing the island the hurricane struck it. An examination of the vessel's log shows that thick, dirty weather as well as a long rolling swell from N.E. prevailed off Martinique at the time the "tornado" was raging the island. Although the "Cuvier" could not have been more than 40 miles distant, the barometer at the vessel indicated no unusual atmospheric disturbance and was steady at 30.50 inches. The Royal Mail "Esk" was seen at anchor off St. Pierre when the "Cuvier" passed. The officer could not say whether the vessel escaped the hurricane or not. The officer believes that the storm must have taken a northerly direction for when Monserrat was passed at 8 A.M. the following day (Aug. 19) the weather was so dark and threatening that the mountains of the island could not be distinguished, although 2 or 3 miles distant (The New York Times, Aug. 27, 1891, p.2, col.4). Author's note: The barometer reading of 30.50 inches reported by the "Cuvier" is obviously too high. 11) The loss of life at Martinique is reported at 700; many persons were injured; property was destroyed to a value of \$ 10,000,000; and all vessels in the island, some 50 sails of all classes, were wrecked (Monthly Weather Review, Aug. 1891). Author's note: Similar statements are included in Garriott (1900), Tannehill (1938) and Salivia (1972). 12) From El Criterio, of Humacao (Puerto Rico), Aug. 21: In the afternoon of Aug. 19 started to rain very heavily here and the rain continued until 2 or 3 A.M. Aug. 20, when the Police alarm went off to announce the overflow of the Humacao River which had inundated sections of the town. From the Boletin Mercantil, Aug. 23: A good friend from Carolina (near San Juan) wrote on Aug. 20 that "from yesterday afternoon rain had not stopped and shortly after 6 A.M. today the river inundated the town, the waters reaching about 2 meters high on Marina, San Juan, San Francisco and other streets, etc". Dispatch from Ponce: Since yesterday at 9 P.M. (obviously Aug. 19), a rainstorm is raging here, accompanied by gusty winds of hurricane force, which reached their height between midnight and 4 A.M. (obviously Aug. 20). Dispatch from Adjuntas: Rain started at 10 P.M. Aug. 19 and continued very heavily for 20 hours. Dispatch from San German: It rained very heavily, causing the rivers to overflow and to carry with them pigs, hens, turkeys and every animal that was encountered, particularly in the low-lying area between Hormigueros and Cabo Rojo. The Gaceta de Puerto Rico did not mention this storm, which is known in Puerto Rico as San Magin, and stated that on Aug. 19 the barometric pressure was 29.90 inches and the wind was S.E. at 7 mph. Don Rafael W. Ramirez listed the storm in his hurricane catalog, but classified it as a "tormenta platanera", a weak one (Salivia, 1972). Author's note: Humacao is located near the east coast of Puerto Rico, Ponce is on the southern coast, Adjuntas is a town in central Puerto Rico and San German is located

near the southwestern corner of the island. 13) Storm of San Magin in the Dominican Republic, Aug. 19, 1891 (Garcia-Bonnolly, 1958). Author's note: The date of Aug. 20 fits better than Aug. 19 for the storm to have affected the eastern portion of Hispaniola. 14) Pursuing a W.N.W. course, the storm passed N. of Grand Turk Island about midnight Aug. 21-22. In the evening the barometer fell steadily until 11:20 P.M. when it remained stationary at 29.21 inches until midnight, after which it began to rise. During the afternoon there had been frequent rain squalls and a marked increase in the force of the wind. At 10:15 P.M. the first and only heavy gust of wind occurred, after which the wind decreased in force until midnight when it again increased from the W. At 12:20 A.M. Aug. 22, the wind was W. by S. and increasing in force; at 12:50 A.M. was about W.S.W. and at 8 A.M. was blowing from the S.E. with heavy rain. At Grand Turk three persons were drowned and the loss of property was confined to small houses and sailing vessels (Monthly Weather Review, Aug. 1891). Author's note: Garriott (1900) reproduced some of the above information about the storm at Turk Islands. 15) From Grand Turk the storm passed to the Bahama Islands, a south hurricane being reported over Crooked Island the evening of Aug. 22 (Monthly Weather Review, Aug. 1891). Author's note: Similar information is given in Garriott (1900). 16) Reports at hand indicate that the storm moved westward with diminishing energy over extreme South Florida during Aug. 24 and passed thence into the Gulf of Mexico, where it probably dissipated, although reports indicated the presence of a cyclonic disturbance over the central and east Gulf until Aug. 29 (Monthly Weather Review, Aug. 1891). Author's note: Garriott (1900) stated that on Aug. 24 the storm was south of Cape Florida, lat. 24.5 N., long. 80 W. 17) Storm of Aug. 17-29, 1891. Martinique, Bahamas, Florida. At Martinique was one of the most disastrous West Indian hurricanes. Severe in Bahamas. Lost force before reaching Florida; dissipated (Tannehill, 1938). 18) Storm of Aug. 24, 1891. S.E. coast of Florida, Minor (Dunn and Miller, 1960). 19) It was first observed near lat. 14 N., long. 59 W. and ended over the West Gulf of Mexico (Garriott, 1900). Author's note: However, a track for the storm displayed in the above publication was ended over the eastern Gulf of Mexico. 20) The storm lasted 7 days; it was first observed near lat. 13 N., long. 58 W. and last observed near lat. 27 N., long. 84 W. Track showing the storm to have passed over Martinique and then across Puerto Rico, turning afterwards more to the west over the Bahamas and southern Florida (Mitchell, 1924). Author's note: This track is quite similar to the one shown in Tannehill (1938).

On the basis of information contained in the items above, the track for Storm 3, 1891 which is shown in Neumann et al. (1993) was modified for the period Aug. 18-22. The track, as modified by the author of this study, was started with a 7 A.M. Aug. 18 position near 13.3 degrees N., 58.0 degrees W. on the basis of information in item 20), made the storm center to cross over Martinique (not over Dominica as indicated by Neumann et al., 1993) during the evening of Aug. 18 (based on items 1 and 2, primarily) and used the author's estimate for the storm center to have been near 16.0 degrees N., 64.0 degrees W. at 7 A.M. Aug. 19 (based on space-time continuity). The author's 7 A.M. Aug. 20 position was estimated

near 18.0 degrees N., 68.0 degrees W. on the basis of general information about the storm in Puerto Rico and in Ponce, in particular (item 12) and on space-time continuity fitting such information. This position is about 80 miles to the southwest of the one shown in Neumann et al. (1993). The author's estimated position for 7 A.M. Aug. 21 was near 21.0 degrees N., 69.5 degrees W. and was based on information about the storm at Grand Turk Island (item 14) and on space-time continuity; this position is about 30 miles to the east of the one shown in Neumann et al. (1993). Their 7 A.M. Aug. 22 position (which is just N.E. of Crooked Island) was adjusted to the E.S.E. to near 22.3 degrees N., 72.3 degrees W. by the author of this study; the adjustment was made in order to fit better the information which was available about the storm at Grand Turk Island (item 14) and at Crooked Island (item 15). 7 A.M. positions for the period Aug. 23-25 shown by Neumann et al. (1993) were kept unchanged because they were supported, in general, by information in item 16). The author's track for Storm 3, 1981 is displayed in Fig. 1.

Information contained in many of the items above allowed the author of this study to confirm the hurricane status which Neumann et al. (1993) show for Storm 3, 1891. The short radius of the storm (item 6) is likely to have contributed to its severity at Martinique, but the surface pressure of 28.98 inches recorded at St. Pierre (item 2) does not support a major hurricane status when the storm crossed over the island in the evening of Aug. 18, 1891.

Storm 4, 1891 (Sept. 2-10), H.

The following information was found in relation to this storm: 1) On Sept. 6 a storm appeared central N.E. of the Bahamas, whence it moved rapidly northward to the east New England coast the evening of Sept. 7, and passed thence northeastward over Newfoundland during the early part of Sept. 8. During Sept. 7, this storm was attained by gales of hurricane force at sea and at night by destructive winds and heavy rain over Nova Scotia (Monthly Weather Review, Sept. 1891). 2) Washington, Sept. 7, 8 P.M. The depression which was off the Middle Atlantic coast this morning moved rapidly to the northward, developing considerable energy and is now central near Eastport. Heavy rain occurred over the New England coast and, although the winds were not high at the immediate coast stations, the storm was probably severe off the New England coast (The New York Times, Sept. 8, 1891, p.5, col.6). 3) Halifax, N.S., Sept. 8. A fearful S.E. gale prevailed over this region last night, the storm raging with terrible intensity from 10 P.M. until after midnight. It was very disastrous to shipping on the coast. Several good-sized vessels and a number of small craft were dashed to pieces in the harbor and other damage was done (The New York Times, Sept. 9, 1891, p.2, col.7). 4) The ship "Atlanta" (from Le Havre) had a rough experience with Atlantic gales. Monday Aug. 7 (it should read Sept. 7) a hurricane burst upon the ship and for 4 hours, Capt. Mac Bride said, there were exceedingly lively times on board. The 3 lower topsails, foresails and head sails were blown clean out of the bolt ropes and into ribbons, so great was the force of the wind. The hurricane raised a tremendous

sea and, although the ship was in ballast and very light, huge waves swept over her deck. Three days later, when in lat. 40 02 N., long. 68 28 W, a vessel was sighted which made out to be a disabled steamship (The New York Times, Sept. 13, 1891, p.8, col.6). 5) The ship "Florena", from San Francisco in 123 days, encountered the same hurricane which the "Atlanta" met and lost 2 of her topsails (The New York Times, Sept. 13, 1891. p.8, col.6). 6) Storm of Sept. 2-11, 1891. Atlantic (Tannehill, 1938). 7) Track showing the following locations: Sept. 6, 30 degrees N., 70 degrees W.; Sept 7, 36.3 degrees N., 71.3 degrees W.; Sept. 7 (night), 44.5 degrees N., 67 degrees W.; Sept. 8, 49.3 degrees N., 56 degrees W. (Monthly Weather Review, Sept. 1891). 8) The storm lasted 9 days. It was first observed at 19 degrees N., 59 degrees W.; it recurved near 33 degrees N., 72 degrees W. and it was last observed at 67 degrees N., 27 degrees W. (Mitchell, 1924).

The information contained in the above items was found to support, in general, the track for Storm 4, 1891 which is displayed in Neumann et al. (1993). Therefore, the author of this study decided to keep such a track unchanged and to reproduce it in Fig. 1.

The hurricane status given to this storm in Neumann et al. (1993) was found to be supported by the information contained in item 1).

Storm 5, 1891 (Sept. 16-26), H.

The following information was found about this storm: 1) On Sept. 18 a cyclone was located N.E. of the Windward Islands. It moved N.N.W. and passed E. of Bermuda about midnight Sept. 21-22 and then recurved eastward. The center reached lat. 40 N, long. 40 W., and then moved N. and merged with a low pressure area over Newfoundland on Sept. 26. The storm was felt at Bermuda from Sept. 19-23. On Sept. 19, the wind was N.E. force 2-4, pressure 29.88 inches at 9 P.M. On Sept 20, wind was N.E. to N.N.E.; at noon, pressure 29.71 inches and wind N. force 5-6; at midnight, pressure 29.40 inches. On Oct. 21 at 8 A.M., wind was N. to N.N.W. force 5-6, pressure 29.21 inches; at 2 P.M. Sept. 21, wind N.W. force 5-6, pressure 29.15 inches; at midnight (Sept. 21-22), wind N.W. force 6-7, pressure 28.95 inches, after which it rose to 29.55 inches by midnight (Sept. 22-23) and 29.90 inches by 9 P.M. Sept. 23, with winds shifting from N.W. to N.N.W. and diminishing in force. A Spanish ship was wrecked on the S.W. coast of Bermuda on Sept. 21 (Monthly Weather Review, Sept. 1891). 2) Storm of Sept. 16- Oct. 3, 1891. Atlantic (Tannehill, 1938). 3) The storm lasted for 17 days. It was first observed near 20 degrees N, 48 degrees W. on Sept. 16; it recurved near 33 degrees N, 64 degrees W. and it was last observed near 66 degrees N., 11 degrees E. (Mitchell, 1924). Author's note: This track, which extended the storm life-span to the Norwegian coast in early Oct. seems to justify that Tannehill (1938) had ended its existence on Oct. 3 as indicated in item 2).

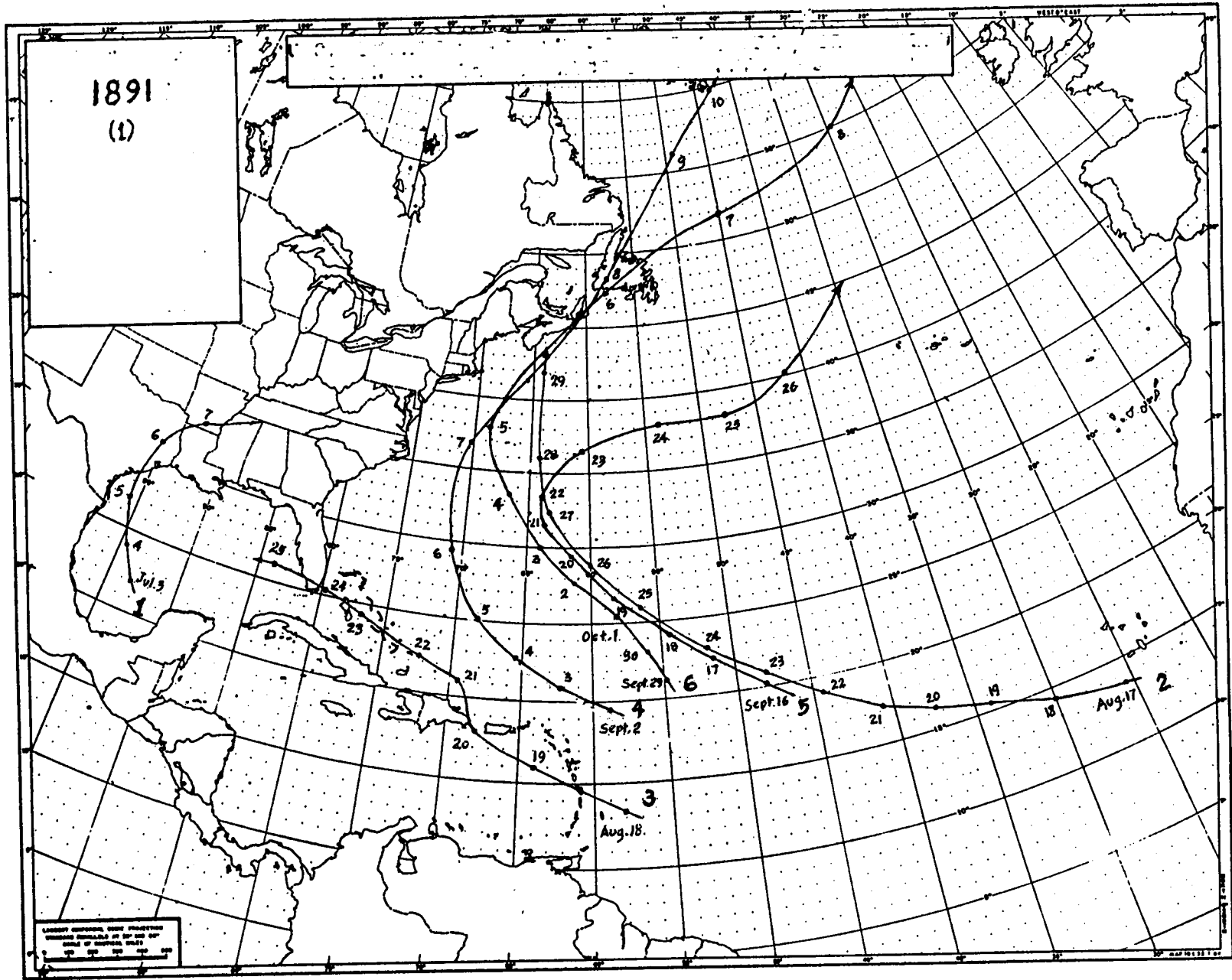
Information in items 1) and 3) allowed the author of this study to introduce some modifications along the track shown by Neumann et al. (1993) for the period Sept. 20-22. A northwestward adjustment along the track was made for the 7 A.M. Sept. 20

position shown in Neumann et al. (1993), resulting in an author's position near 29.5 degrees N., 61.5 degrees W. This new 7 A.M. Sept. 20 position provided for a reasonable space-time continuity between the 7 A.M. Sept. 19 position in Neumann et al. (1993) and the 7 A.M. position which was estimated by the author of this study. This latter position was based on wind and pressure information available for Bermuda (item 1) and, to a lesser extent, on recurvature information (item 3), and was near 31.5 degrees N., 63.7 degrees W. The author's estimated position for 7 A.M. Aug. 22 was near 33.3 degrees N., 64.0 degrees W. and was about equally based on information in items 1) and 3) and, in addition, on space-time continuity. The author of this study kept unchanged 7 A.M. positions along the track in Neumann et al. (1993) for days prior to Aug. 20 and after Aug. 22; he was unable to check positions for those days due to the lack of marine data in the above items. The author's track for Storm 5, 1891 is displayed in Fig. 1.

Although no hurricane winds were reported at Bermuda, the lowest pressure of 28.95 inches (item 1) was found to be low enough to support the hurricane status which Neumann et al. (1993) gave to this storm.

Storm 6, 1891 (Sept. 29- Oct.8), H.

The following information was found in relation to this storm: 1) On Oct. 1, a storm of considerable energy was central N.E. of the Windward Islands, whence it moved to the N.W. and in the morning of Oct. 4 was central W. of Bermuda. During Oct. 4-5 the path recurved to the N. and N.E. The center of disturbance reached Nova Scotia the night of Oct. 5, and moving thence E.N.E. apparently joined the Iceland area of low pressure by Oct. 8. The storm passed S. of Bermuda the night of Oct. 3-4, attended by heavy N.N.E to E. and S. gales and pressure falling to 28.97 inches at Bermuda at 8 P.M. Oct. 3. Gales of force 10 to 11 attended the recurvature of this storm to the N.E., and during Oct. 7-8, when central over mid-ocean, the pressure fell below 29.00 inches and terrific gales were encountered along the steamship routes (Monthly Weather Review, Oct. 1891). 2) Jacksonville, Oct. 16. Schr. "Julia A. Waar" arrived here bringing on board the captain and 6 men of the crew of the brig "Alice" which was abandoned 40 miles S.E. of Cape Lookout early Wednesday morning (Oct. 14). The "Alice" left Rio on Aug. 25 and weather was fine until Oct. 3. Then, we met a hurricane from N.E., Capt. Bowling said. The bark was badly strained and leaking badly. Then about Oct. 10 another gale struck the ship. Men were kept on the pumps Sunday, Monday and Tuesday (Oct. 11-13). But on Wednesday, they went to the boat with oil, water and provisions and watched the brig go down (The New York Times, Oct. 17, 1891, p.1, col.4). Author's note: Obviously, the gale of Oct. 10 was unrelated to this storm. 3) Halifax, N.S., Oct. 6. A special calegram received here says that a tremendous wind and rain storm has been raging around Bermuda for 2 days and all incoming steamers report having encountered very rough weather. It took the mail steamer "Duart Castle" 7 days to run from St. Thomas to Bermuda. The captain reports to have encountered the most tempestuous weather, with mountainous seas, that he ever



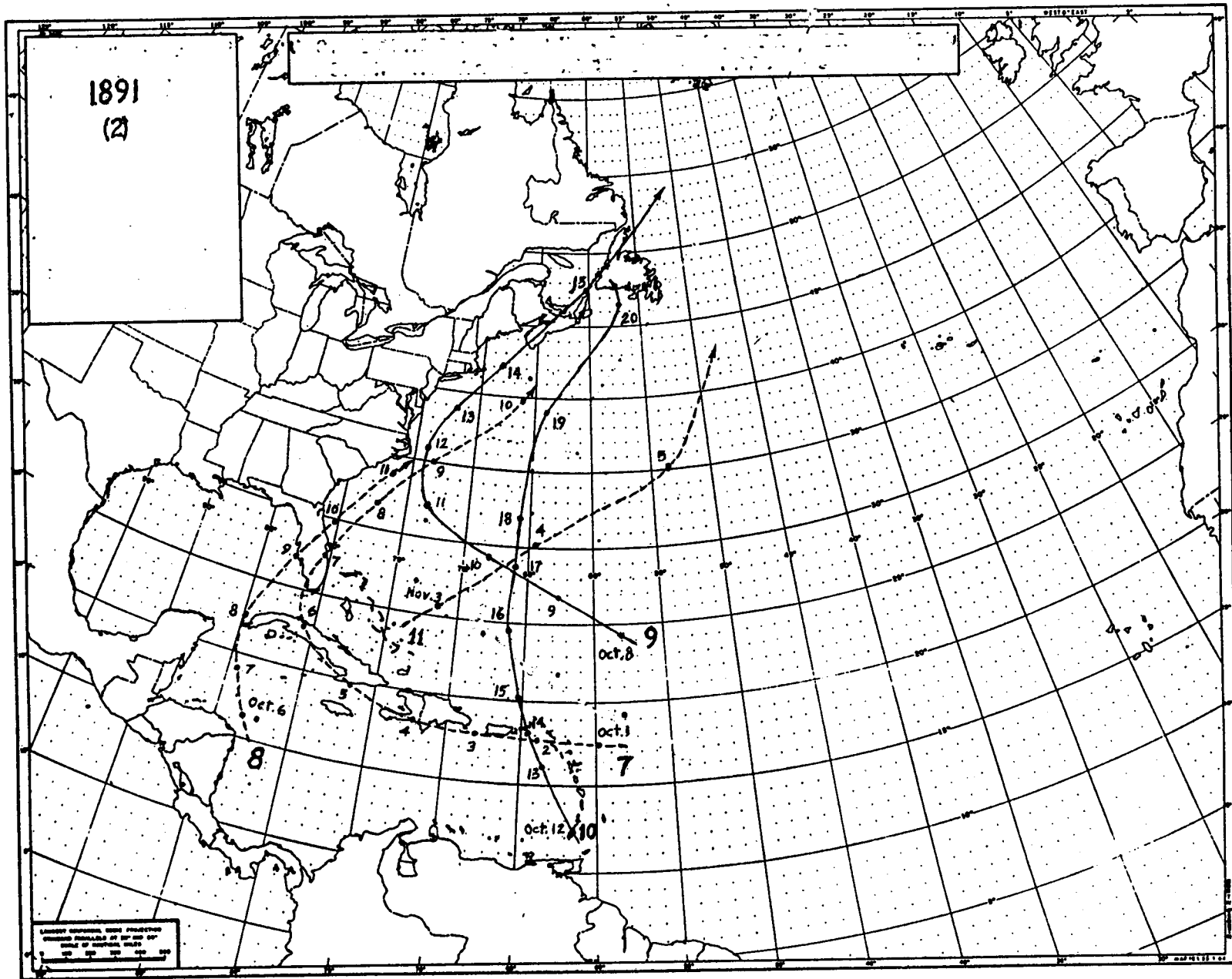


Fig. 1 (continued)

experienced (The New York Times, Oct. 7, 1891, p.1, col.6). 4) Washington, Oct. 6, 8 P.M. The storm off Nova Scotia coast has moved N.E. to Newfoundland (The New York Times, Oct. 7, 1891, p.5, col.6). 5) Storm of Sept. 29- Oct. 10, 1891. Atlantic; recurved between Hatteras and Bermuda (Tannehill, 1938). 6) The storm was first observed near 23 degrees N., 55 degrees W. and it dissipated N.E. of Newfoundland (Garriott, 1900). 7) Track showing the following positions: Oct. 1, lat. 23 N., long. 58 W.; Oct. 2, lat. 26.3 N., long. 59 W.; Oct. 3, lat. 28 N, long. 60 W.; Oct. 4, lat. 32.3 N., long. 67.3 W.; Oct. 5, lat. 37.7 N., long. 69 W.; Oct. 6, lat. 47 N., long. 58 W. (Monthly Weather Review, Oct. 1891). 8) The storm was first observed on Sept. 29 at lat. 21 N., long 55 W. and lasted for 11 days; it recurved at lat. 39 N., long, 68 W. and it was last observed at lat. 67 N., long. 13 W. (Mitchell, 1924).

On the basis of meteorological information from Bermuda (item 1), the author of this study made the storm to pass much closer to that island than it is shown in Neumann et al. (1993). This resulted in estimating new 7 A.M. positions for the period Oct. 2-4. The 7 A.M. Oct. 2 position in Neumann et al. (1993) was slightly adjusted to the S.E. in order to obtain better space-time continuity between the 7 A.M. Oct. 1 position given by the above authors and the new estimated position for 7 A.M. Oct. 3 by the author of this study. The adjusted 7 A.M. Oct. 2 position was near 27.7 degrees N., 61.3 degrees W. The author estimated positions near 30.0 degrees N, 64.0 degrees W. for 7 A.M. Oct. 3 and near 33.5 degrees N., 66.7 degrees W for 7 A.M. Oct. 4. Such positions were based on wind and pressure information for Bermuda indicating that the storm passed to the S. of that island during the night of Oct. 3-4. Positions along the track shown in Neumann et al. (1993) for days prior to Oct. 2 and after Oct. 4 were kept unchanged. The author's track for Storm 6, 1891 is displayed in Fig. 1.

The hurricane status which Neumann et al. (1993) attributed to the storm was found to be supported by the pressure of 28.97 inches reported at Bermuda (item 1). This value implies a significantly lower central pressure as the storm passed to the south of that island.

Storm 7, 1891 (Oct. 1-10), T.S.

Storm 8, 1891 (Oct. 6-11), T.S

Storm 9, 1891 (oct. 8-15), H.

Because of the apparent interrelation which existed among these three alleged storms, the author of this study decided to investigate them together.

The following information was found in relation to these storms: 1) On Oct. 6 a cyclonic area was apparently central south of western Cuba; by Oct. 7 the storm had reached southern Florida, moving northeastward. Moving slowly northeastward off the Atlantic coast the center reached Nova Scotia on Oct. 14, and moving thence E.N.E. was central S. of Iceland on Oct. 18 and probably passed thence to the British Isles by Oct. 21. From Oct. 11, this storm was apparently joined by a cyclonic area from the east part of the Gulf of Mexico. From Oct. 11 to 14, the passage of this storm was attained by the heaviest gales of the month along the Middle

Atlantic and New England coasts, and at points from the Carolinas to the S.E. New England coast the maximum wind velocity exceeded 70 mph, causing disasters to shipping and damage to property. The very high winds reported are a notable feature of the storm, inasmuch as the barometric pressure was slight, the lowest reading being about 29.50 inches the morning of Oct. 14. The barometric gradient was, however, very steep to the northward of the center during Oct. 13-14 (Monthly Weather Review, Oct. 1891). 2) Oct. 6-12, 1891. Extensive perturbation which formed in the South Sea (the Caribbean) and moved across the central provinces of Cuba. The strongest winds occurred on the southern coast of the island, where some vessels came ashore. There was flooding at El Roque and one person was drowned at Cienfuegos and a second one at Sagua la Grande. There was also flooding and some houses destroyed at Havana, without casualties. The tobacco crop was lost at Pinar del Rio (Sarasola, 1928). Author's note: Actually taken from the catalog of Cuban cyclones by M. Gutierrez-Lanza, which is included in Sarasola (1928). 3) Havana, Oct. 6. The barometer now registers 753.6 millimeters (29.67 inches). Father Vines says that the present extensive area of low pressure and the incessant falling of the mercury give rise to the fear that a cyclonic center is forming to the S. or. S.E. of Havana (The New York Times, Oct. 7, 1891, p.1, col.4). 4) Washington, Oct. 7, 8 P.M.. The storm in Florida has moved slowly N. and has spread to the Middle and South Atlantic coast. For eastern Florida: showers, slightly cooler, northerly winds (The New York Times, Oct. 8, 1891, p.5, col.6). 5) Washington, Oct. 10, 8 P.M. The storm has remained nearly stationary over Florida with rain extending to North Carolina. For eastern Florida: rain with stationary temperatures, northerly winds (The New York Times, Oct. 11, 1891, p.5, col.6). 6) Washington, Oct. 11, 8 P.M. The storm has remained nearly stationary over Florida (The New York Times, Oct. 12, 1891, p.5, col.7). 7) The roaring gale which yesterday affected the city (New York) was not so erratic in its course out in the open sea. At Sandy Hook the wind came from the N.W. as a heavy gale (The New York Times, Oct. 12, 1891, p.8, col.4). 8) Washington. Oct. 12, 8 P.M. The disturbance over Florida appears to be gradually filling up (The New York Times, Oct. 13, 1891, p.5, col.6). 9) Long Branch, N.J., Oct. 13. The severe N.E. wind and rain which have been raging for the past 24 hours has done considerable damage over the Jersey coast. For 12 hours the wind has blown 40-50 mph and the sea has been unusually high and stormy (The New York Times, Oct. 13, 1891, p.1, col.5). 10) Asbury Park, N.J., Oct. 13. The northeaster which set in last night and continued with unabated fury during the day, has subsided somewhat tonight (The New York Times, Oct. 13, 1891, p.1, col.5). 11) Vineyard Haven, Ma., Oct. 13. The N.E. gale continues and is raging furiously tonight. A large fleet of vessels is anchored here but no further disasters are reported (The New York Times, Oct. 14, 1891, p.1, cols.5 and 6). 12) Point Pleasant, N.J., Oct. 13. The high tide this evening cut the beach badly at Seabright. The barometer has fallen 25 degrees (it should read 25 hundredths of an inch) since 9 P.M. last night (The New York Times, Oct. 14, 1891, p.1, col.5). 13) Last Saturday (Oct. 10, brig "Alice", which has been in a hurricane on Oct. 3, had a good

deal of water and the ship was working badly. Then another gale struck. Sunday, Monday and Tuesday, men were kept at the pumps but early Wednesday (Oct. 14) the vessel was abandoned (The New York Times, Oct. 17, 1891, p.1, col.4). Author's note: The "Alice" was abandoned 40 miles S.E. of Cape Lookout Light. 14) Boston, Oct. 13. Schr. "Hanbinger" was towed here tonight. She became unmanageable during the severe gale of Sunday night (Oc. 11) off Thatcher's Island. Her decks were continuously under water and the crew was obliged to take to the rigging where they remained until rescued by the tug "Elsie" off Boston Light this afternoon (The New York Times, Oct. 14, 1891, Oct. 14, 1891, p.1, col.6). 15) Steamer "La Champagne", from Le Havre, has arrived. The night of Oct. 15 a tremendous wave boarded the vessel and did much damage to bridge and promenade deck (The New York Times, Oct. 20, 1891, p.8, col.5). 16) Maximum wind was N. 72 mph at Hatteras and N.E. 78 mph at Kittyhawk on Oct. 12 (Monthly Weather Review, Oct. 1891). 17) Storm of Oct. 7, 1891. Fort Myers to Palm Beach. Mininal (Dunn and Miller, 1960). 18) Storm of Oct. 1-9, 1891. Puerto Rico, Haiti, Cuba, Florida. Storm of Oct. 6-11. Western Caribbean, Florida, Atlantic coast (Tannehill, 1938). 19) Storm track: Oct. 6, 20 degrees N. 83.3 degrees W.; Oct, 7, 27 degrees N., 81 degrees W.; Oct. 8, 29 degrees N., 77 degrees W., Oct. 9, 30.3 degrees N., 74.5 degrees W.; Oct. 10, 31 degrees N., 72.3 degrees W.; Oct. 11, 34.3 degrees N., 73.5 degrees W.; Oct. 12, 36 degrees N., 73.3 degrees W.; Oct. 13, 38.3 degrees N., 72 degrees W.; Oct. 14, 43 degrees N., 67.7 degrees W.; Oct. 14 (night), 45 degrees N., 61.7 degrees W. Another track: Oct.9, 25.5 degrees N., 83 degrees W.; Oct. 10, 29.7 degrees N., 80 degrees W.; Oct. 11, 34.3 degrees N., 73.5 degrees W. (Monthly Weather Review, Oct. 1891). 20) An Oct. 2891 listed storm which appeared at lat. 20 N., long. 83 W., recurved at lat. 21 N., long. 83 W. and disappeared N.E. of Newfoundland. Map which shows a storm track extending from the east Gulf of Mexico on Oct. 9 to S.E. of Hatteras on Oct. 11 (Garriott, 1900). 21) Storm starting at lat. 17 N., long. 60 W. on Oct. 1 which lasted 8 days; it recurved at lat. 24 N., long. 81 W. (after crossing Hispaniola and Cuba) and it was last observed at lat. 40 N., long. 66 W. A second storm starting on Oct. 6 at lat. 16 N., long. 83 W. and lasting 5 days; it recurved at lat. 21 N., long. 85 W. and it was last observed at lat. 33 N., long. 77 W. A third storm starting on Oct. 8 at lat. 24 N., long. 58 W. and lasting 16 days; it recurved at lat. 34 N., long. 76 W. and it was last observed at lat. 67 N., long. 11 E. (Mitchell, 1924). Author's note: In addition of being listed by Mitchell (1924), tracks for the above three storms are displayed on a map; these tracks were found to be quite similar to the ones shown in Neumann et al. (1993) for Storms 7, 8 and 9, 1891, respectively.

The author of this study believes that the information contained in the items above is not coherent enough as to show beyond any doubt the existence of the three storms shown in Neumann et al. (1993). He rather believes that, most likely, only one storm, with a possible secondary low pressure area lagging in the eastern Gulf and Florida, was what happened in reality. In the author's opinion, which is based on careful examination of the items above, the most plausible track for such a storm appears to

extend from a position roughly to the S. of Havana on Oct. 6 to the Newfoundland area on Oct. 15. Items 1) through 3) and items 19) and 20) were found to support the starting region of the above track, the first track in item 20 provided support for the storm to have reached the Newfoundland area, and the possible area of low pressure lagging in the eastern Gulf of Mexico and Florida was suggested by the Gulf disturbance indicated in item 1) and by weather notes that kept the storm nearly stationary and finally filled it up in Florida (items 5, 6 and 8). Nevertheless, the author of this study did not find enough evidence to entirely disprove the existence of the three storms and, consequently, he decided to keep unchanged the tracks for Storms 7, 8 and 9, 1891 which are displayed in Neumann et al. (1993) and to reproduce them in Fig. 1.

The tropical storm status given by Neumann et al. (1993) to Storms 7 and 8, 1891 and the hurricane status they assigned to Storm 9, 1891 were also kept unchanged.

Storm 10, 1891 (Oct. 12-20), H.

The following information was found about this storm: 1) The presence of a cyclonic area over the east part of the Caribbean Sea was indicated by reports of Oct. 13 through 15. During Oct. 15 the path apparently recurved northward over or near Santo Domingo and the morning of Oct. 17 the center was located E. of the Bahamas, whence it moved N.E. and reached the S. coast of Newfoundland on Oct. 20. On Oct. 17 gales of hurricane force were encountered to the E.N.E. of the Bahamas. The night of Oct. 17 a strong S.E. gale set in at Bermuda. At 10 A.M. Oct. 18 the barometer fell to 29.30 inches at Bermuda, and during the day the wind was S.E. to S.W. and reached force 11, causing considerable damage. The storm center passed W. of Bermuda at 7 P.M. Oct. 18. During Oct. 19 there was an apparent decrease in energy, and during Oct. 20 the path recurved westward and the storm was united with a low area in the St. Lawrence Valley (Monthly Weather Review, Oct. 1891). Author's note: The passage of the storm W. of Bermuda at 7 P.M. Oct. 18 does not agree with the wind and pressure information given in this item; the storm center should have passed nearest to Bermuda late in the morning of Oct. 18. In addition, Garcia-Bonnely (1958) does not mention any storm as having affected Santo Domingo around Oct. 15, 1891. 2) Storm of Oct. 12-22, 1881. Tobago, Puerto Rico, Bermuda (Tannehill, 1938). Author's note: It should be stated that Salivia (1972) does not mention this storm as having affected Puerto Rico. 3) The Gazette of Bermuda remarked that on Oct. 17-18 the tides were pre-eminently high. The sea breached on the shores terrific, some of the observing landholders remarking the displacement of huge stones which for 40 years had laid at rest on green grassy pastures bounding the South Side Shore almost as level in many places. The Causeway is considerably damaged between Longbird and Hamilton Parish shore. About 1000 feet in length of the Guard-wall on Castle Harbor side is down, also considerable damage to retaining wall on that side (Tucker, 1982). 4) The "Ocean Prince" cleared from Gibraltar to this port (New York) on Oct. 3. When in lat. 36 N., long. 62 W. her troubles began and ended only reaching

this port. A hurricane was encountered on Oct. 19 in the locality given, which is about 700 miles E. of this port. It blew with considerable fury and raised a tremendous sea which swept the decks, carrying away everything movable (The New York Times, Oct. 22, 1891, p.1, col.5). 5) Halifax, N.S., Oct. 21. Heavy storms have swept over Nova Scotia coast during the past 2 days. Many vessels have been wrecked but no serious loss of life has yet been reported (The Times. London, Oct. 22, 1891, p.5, col. 6). 6) An Oct. 1891 storm appeared near 16 degrees N., 63 degrees W., recurved near 18 degrees N., 70 degrees W. and disappeared N.E. of Newfoundland (Garriott, 1900). Author's note: The information contained in this item implies that the storm crossed over the Dominican Republic; however, Garcia Bonnelly (1958) does not list this storm as having occurred there. 7) Map showing a track for the storm as follow: Oct. 13, 15.4 degrees N., 63.4 degrees W.; Oct. 14, 15.7 degrees W., 65 degrees W.; Oct. 15, 16.4 degrees N., 68 degrees W.; Oct. 16, 22.3 degrees N., 70 degrees W.; Oct. 17, 26.2 degrees N., 71.5 degrees W.; Oct. 18, 29.3 degrees N., 68.8 degrees W.; Oct. 19, 36.4 degrees N., 64.7 degrees W.; Oct. 20, 46.5 degrees N, 61.3 degrees W. (Monthly Weather Review, Oct. 1891). Author's note: This track also implies that the storm crossed the Dominican Republic over its easternmost portion. In addition, from Oct. 15 through Oct. 18, the daily positions shown along this track were found to be about 250 miles to the S.W. of the corresponding positions displayed in Neumann et al. (1993). 8) The storm was first observed near lat. 11 N., long. 62 W. on Oct. 12, 1891 and lasted 10 days; it recurved near lat, 25 N., long. 66 W. and it was last observed near lat. 66 N, long. 44 W. (Mitchell, 1924). Author's note: The track displayed in Mitchell (1924) was found to be very similar to the storm track in Neumann et al. (1993).

After having discarded a) some of the information in items 1), 6) and 7) on the ground that Garcia-Bonnelly (1958) does not mention the storm to have affected the Dominican Republic and b) that the storm affected Puerto Rico (item 2) because Salivia does not mention it as having affected that island, the author of this study found that the information contained in the remaining items supports the track for Storm 10, 1891 which is shown in Neumann et al. (1993). Therefore, he reproduced such a track in Fig. 1.

Information in items 1) and 4) was found to support the hurricane status that Neumann et al. (1993) attributed to the storm.

Storm 11, 1891 (Nov. 3-5), T.S.

The following information was found in relation to this storm: 1) On Nov. 3 an ill-defined cyclonic area was indicated over the Caribbean Sea S. of Cuba. The morning of Nov. 4 the storm was located S. of Bermuda. Moving northeastward the disturbance reached the 34 degrees N. parallel by Nov. 5 and the morning of Nov. 6 was central on the N.E. edge of the Banks of Newfoundland, with a decided increase in energy, and strong to whole gales between the 40 and the 50 degrees W. meridians. Moving thence E.N.E. the center occupied a position N.W. of the British Isles on Nov. 8 (Monthly Weather Review, Nov. 1891). Author's note: The apparent jump of the

storm location from S. of Cuba on Nov. 3 to S. of Bermuda on Nov. 4 is questionable. 2) Washington, Nov. 4, 1891, 8 P.M. The low pressure area this morning promised developing sufficient over Cuba to warrant the display of information signals on the Florida coast (The New York Times, Nov. 4, 1891, p.5, col.6). 3) Washington, Nov. 4, 1891. The threatening storm in the West Indies has made no further approach upon the Florida coast. Reports from the Bermuda Islands show a (pressure) fall of nearly three tenths of an inch in the past 24 hours and indicate that the storm has passed to seaward of Florida towards those islands (The New York Times, Nov. 5, 1891, p.5, col.6). 4) Map showing a storm track as follows: Nov. 4, 29 degrees N., 65 degrees W.; Nov. 5, 34 degrees N., 59.7 degrees W.; Nov. 6, 47.5 degrees N., 48 degrees W. (Monthly Weather Review, Nov. 1891). 5) A storm was first noted at lat. 24 N., long. 73 W. on Nov. 3 and lasted 6 days; it was last observed at lat. 65 N., long. 11 W. (Mitchell, 1924). Author's note: This track shows a Nov. 3 position well to the N.E. of Cuba which contrasts with the Nov. 3 positions to the S. and over Cuba indicated in items 1) and 2), respectively. The Nov. 3 position shown by Mitchell (1924) was found to keep a much better space-time continuity with the evolution followed by the storm after that date.

After accepting the Nov. 3 position in item 5), the author of this study found that information for other days in the above items seemed to support the track for Storm 11, 1891 which is displayed in Neumann et al. (1993). Therefore, he decided to keep unmodified such a track and to reproduce it in Fig. 1.

The tropical storm status given to the storm by Neumann et al. (1993) was kept unchanged because there was no evidence of hurricane intensity in the content of the items above.

Special statement.

In addition to the storm fully discussed above, four other possible cases were found for 1891. Available information related to these cases was insufficient to determine the occurrence of winds of tropical storm and/or to verify their alleged evolution.

A) Case of Jul. 9-12. 1891.

This possible case was identified by using the following information: 1) Map showing a track for a low pressure area starting near 28.5 degrees N., 86.3 degrees W. in the morning of Jul. 9 and extending to 29.3 degrees N., 82.3 degrees W. on Jul. 10, to 32 degrees N., 76 degrees W. on Jul. 11 and to 38 degrees N., 72.3 degrees W. on Jul. 12 (Monthly Weather Review, Jul. 1891). No additional information was found about this weather system which appears to have had only a very slim probability to have acquired tropical storm intensity.

B) Case of Sept. 11-12, 1891.

This second possible case was based on the following information: 1) On Sept. 11 a disturbance was central over the east part of the Gulf of Mexico; heavy rain and high winds occurred over

the E. Gulf coast. In the morning of Sept. 12 the storm was over the extreme western Florida, after which it apparently dissipated (Monthly Weather Review, Sept. 1891). 2) Washington, Sept. 11, 8 P.M. The depression which was in the central Gulf this morning has become clearly defined and is apparently moving slowly to the northeastward. It has not yet reached the east Gulf coast (The New York Times, Sept. 12, 1891, p.5, col.5). 3) Track for this possible case as follows: Sept. 11 (morning), 25 degrees N., 86 degrees W.; Sept. 11 (night), 28 degrees N., 86 degrees W.; Sept. 12, 30 degrees N., 87 degrees W. (Monthly Weather Review, Sept. 1891). This case appears to have had a much better chance than case A) to have attained tropical storm status.

C) Case of Sept. 14-15.

This possible case was based on the following information: 1) On Sept. 14 an apparently developing storm was central between Bermuda and the North Carolina coast. It moved rapidly to Newfoundland by Sept. 15 and to the N.W. of the British Isles by Sept. 18 (Monthly Weather Review, Sept. 1891). 2) Track for this possible case as follows: Sept. 14, lat. 34 N., long. 67 W.; Sept. 15, lat. 48.7 N., long 56 W. (Monthly Weather Review, Sept. 1891). The author of this study believes that this case had a somewhat less chance than case B) of having become a tropical storm.

D) Case of Sept. 18-21.

This possible case was identified by using the following information: 1) On Sept. 18 a cyclonic disturbance was indicated S. of western Cuba. On Sept. 19 the cyclone center was apparently located to the W.S.W. of Havana. On Sept. 20 it was over the middle Gulf, with high winds and heavy rains on central and west coasts (Monthly Weather Review, Sept. 1891). 2) Washington, Sept. 20, 8 P.M. There are indications that a storm of considerable energy is central in the Gulf S. of New Orleans (The New York Times, Sept. 21, 1891, p.5, col.6). 3) Washington, Sept. 21, 1891, 8 P.M. Conditions are less threatening in the Gulf and, if the storm exists, reports of coastal stations give no indication of its location (The New York Times, Sept. 22, 1891, p.5, col.5). 4) Track for this possible case as follows: Sept. 19, 22 degrees N., 86 degrees W.; Sept. 20 (morning), 24 degrees N., 87.3 degrees W.; Sept. 20 (night), 26.7 degrees N. 89 degrees W.; Sept. 21, 26.7 degrees N., 91.7 degrees W. (Monthly Weather Review, Sept. 1891). Out of the four possible cases, this one seems to have had the highest probability of having become a tropical storm.