

YEAR 1896

Seven storms were found to have occurred in 1896. Tracks for these storms were presented in Fig. 3.

Storm 1, 1896 (Jul. 4-12), H.

The following information was found about this storm: 1) Washington, Jul. 7, 8 P.M. The depression in the Gulf has advanced slowly eastward to the S. of Western Florida, increasing slightly in intensity, a velocity of 36 mph being reported from Mobile and Jacksonville. Signals are displayed at Pensacola, Punta Gorda, Tampa, Savannah and its area (The New York Times, Jul. 8, 1895, p.6, col.7). 2) Washington, Jul. 8, 8 P.M. The Gulf storm has moved to North Carolina, diminishing slightly in intensity. Signals are displayed on the Atlantic coast from Wilmington to Boston and Boston area. (The New York Times, Jul. 9, 1895, p.6, col.7). 3) Some maximum velocities were as follows: Pensacola, N. 72 mph on Jul. 7; Mobile, N.E. 36 mph on Jul. 7; Atlanta, N.E. 34 mph on Jul. 8; Savannah, S. 29 mph. on Jul. 8; Augusta, S.W. 48 mph on Jul. 8; Charleston, S. 36 mph on Jul. 8; Wilmington, S. 32 mph on Jul. 8 (Monthly Weather Review, Jul. 1896). 4) Storm of Jul. 7, 1896. Pensacola. Extreme wind: Pensacola 100 mph (Dunn and Miller, 1960). 5) Storm of 1896. Western Caribbean (Tannehill, 1938). 6) Track for the storm showing the following positions: Jul. 6 (evening), lat. 28.7 N., long. 92.7 W.; Jul. 7 (morning), lat. 29.3 N., long. 88 W.; Jul. 7 (evening), lat. 29.5 N., long. 87 W.; Jul. 8 (morning), lat. 33 N. long. 83 W.; Jul. 8 (evening), lat. 35 N., long. 81.5 W.; Jul. 9 (morning), lat. 40 N., long. 83.7 W.; Jul. 9 (evening), lat. 42.5 N., long. 83.5 W.; Jul. 10 (morning), lat. 47 N., long. 85 W. (Monthly Weather Review, Jul. 1896). 7) A storm was first observed at lat. 21 N., long. 81 W. on Jul. 4, 1896 and lasted 8 days; it recurved at lat. 30 N., long. 87 W. and it was last observed at lat. 61 N., 65 W. (Mitchell, 1924). Author's note: A track which is included in Mitchell (1924) was found to be quite similar to the one in Neumann et al. (1993).

Some of the items above suggested some modifications to be introduced along the track for Storm 1, 1896 in Neumann et al. (1993). The author of this study adjusted their 7 A.M. Jul. position by about 40 miles to the W. to near 29.7 degrees W., 86.7 degrees W. and, by so doing, brought the storm center closer to Pensacola as suggested by the maximum velocity of 72 mph from the N. reported at that place (item 3) and the even higher velocity of 100 mph mentioned in item 4). The author also adjusted the 7 A.M. Jul. 8 position in Neumann et al. (1993) by about 100 miles to the S.E. to near 33.3 degrees N., 83.5 degrees W.; the reason for the adjustment was to fit wind information for Atlanta and Augusta (item 3) which suggested that the storm passed to the east of Atlanta and just west of Augusta on Jul. 8. In addition, the author of this study believes that the track in Neumann et al. (1993) for the period Jul. 4-6 might not be the correct one because a) Sarasola (1928) and Nartinez-Fortun (1942) do not mention any storm in Cuba during Jul. 1896 and b) the track for Storm 1, 1896 shown

in item 6) and the weather note in item 1) indicate an eastward motion (instead of a N.W. movement) prior to the storm making landfall just E. of Pensacola. However, as the author could not definitively prove that that portion of the track in Neumann et al. (1993) is in error, he decided to keep it unchanged. The author's new track for Storm 1, 1896 is displayed in Fig. 3.

The hurricane status given to the storm in Neumann et al. (1993) was fully verified by the 100 mph winds which occurred at Pensacola (item 4). As the center passed to the E. of Pensacola, it is likely that the maximum winds of the storm at landfall were over 110 mph and, therefore, the categorization of the storm as a major hurricane, which is given in item 4), appears to be correct.

Storm 2, 1896 (Aug. 30- Sept. 11), H.

The following information was found about this storm: 1) This storm is known in Puerto Rico as San Ramon Nonato, III or San Gil. The Buscapie, Sept. 1, stated that the storm of rain and wind started around 9 P.M. last night (Aug. 31) and lasted until the early morning hours (Sept. 1) and that the barometer did not drop much (at San Juan). At Juana Diaz the storm destroyed 5 houses of the shore. The Portugues River (Ponce area) and the Rio Piedras (San Juan area) overflowed. There was great flooding at Bayamon, Carolina and Loiza (Salivia, 1972). Author's note: Garcia-Bonnelly (1958) also mentioned the storm to have occurred at Hispaniola on Aug. 31, but the storm should have been felt there mostly on Sept. 1-2. 2) A storm was reported developing off the Atlantic coast of Florida. Rains may be expected today on the South Atlantic coast (The New York Times, Sept. 6, 1896, p.1, col.6). 3) Photo of a barograph curve taken on board the steamship "Francois Arago", which crossed near the center of the storm off the Bahama Banks in the evening of Sept. 6. The lowest pressure was recorded at 6:30 P.M. according to the barograph trace but, in compliance with what was stated by Mr. A Rouilliard, engineer in charge of the ship, one and a half hours should be added to obtain 75 degrees W. meridian time. The pressure minimum was 717.3 millimeters (28.24 inches). Mr. Rouilliard claimed that the position on the hurricane center was near 28 50 degrees N., 74 40 degrees W. at 9 P.M. Sept. 9, and this position was based upon an estimate of the position of the steamer at noon Sept. 7. Mr. Rouilliard stated that the ship was at the center of the hurricane and suffered considerable damage; two boats carried away, one man overboard, steam steering gear and hand steering gear both broken (Monthly Weather Review, Sept. 1896). 4) Bark "Viva" sailed from Savannah on Aug. 30 for Glasgow. The voyage was without incident until Sept. 9 when about 140 miles S. of Nantucket Shoals she ran into a hurricane, The wind came first from the E., hovering later to the S. (The New York Times, Sept. 15, 1896, p.1, col.3). 5) Bark "Charles Racine" which sailed Sept. 7 from Sydney, N.S. came to an anchorage off the Staten Island yesterday. She was struck by a gale on Sept. 9 and lost her fore and main lower topsail, foresails. 3 jibs and staysails (The New York Times, Sept. 15, 1896, p.5, col.3). 6) The West Indian storm which appears off the S.E. coast of Massachusetts yesterday morning had advanced slowly northward last night. a pressure of 29.60

inches being reported from Block Island, with a wind velocity of 75 mph (The New York Times, Sept. 10, 1896, p.1, col.6). 7) The storm off the Massachusetts coast had nearly disappeared or moved east into the ocean (The New York Times, Sept. 11, 1896, p.1, col.6). 8) Providence, R.I. Five boats were wrecked at Point Judith during the storm yesterday and last night. The wind at one time reached 80 mph and the captain of the life-saving station says that the storm was one of the worst on record for this season of the year (The New York Times, Sept. 11, 1896, p.3, col.6). 9) Highland Light, Ma., Sept. 10. The storm continued all last night with great force. N.E. winds shifting to S.E. and S.W. prevail tonight (The New York Times, Sept. 11, 1896, p.3, col.6). 10) Boston, Ma., Sept. 10. Four sloops were sunk in Dorchester Bay early this morning as a result of the storm (The New York Times, Sept. 11, 1896, p.3, col.1). 11) Vineyard Haven, Ma., Sept. 10. About 50 fishing schooners and a number of coasters were anchored at Tarpauling Cove last night during the violent easterly gale (The New York Times, Sept. 11, 1896, p.3, col.7). 12) Some maximum velocities were as follows: Block Island, N.E. 75 mph on Sept. 9; Woods Hole, N.W. 48 mph on Sept. 10; Nantucket, S. 55 mph on Sept. 10; Boston, N.E. 41 mph on Sept. 10 (Monthly Weather Review, Sept. 1896). 13) Storm of Sept. 10, 1896. East portion of New England. Minimal hurricane R.I. to Me. (Dunn and Miller, 1960). 14) Storm of Sept. 3-11, 1896. Cuba, Bahamas (Tannehill, 1938) Author's note: The storm does not seem to have affected Cuba; Sarasola (1928) and Martinez-Fortun (1942) have not listed this storm as having been felt in Cuba. 15) Track for this storm showing the following morning positions: Sept. 5, lat. 26 N., long. 78 W.; Sept. 6, lat. 28 N., long. 78.3 W.; Sept. 7, lat. 31.5 N., long. 74 W.; Sept. 8, lat. 33.7 N., long. 71 W.; Sept. 9, lat. 39 N., long. 71.5 W.; Sept. 10, lat. 41.5 N., long. 71.7 W. (Monthly Weather Review, Sept. 1896). 16) A storm was first observed at lat. 20 N., long. 83 W. on Sept. 3, 1896 and lasted 8 days; it was last observed at lat. 45 N., long. 70 W. (Mitchell, 1924). Author's note: The corresponding track in Mitchell (1924) differs significantly from the one in Neumann et al. (1993) in that it was started over the N.W. Caribbean Sea on Sept. 3 and not in the vicinity of Martinique on Aug. 30. This allegedly track crossed Cuba into the N.W. Bahamas while the one in Neumann et al. (1993) made the storm to pass over the N.E. coast of Hispaniola and then into the S.E. Bahamas. The track in Mitchell (1924) is in error because Sarasola (1928) and Martinez-Fortun (1942) do not show any storm in Cuba early in Sept. 1896 and, above all, there is evidence of the storm in Puerto Rico and Hispaniola (item 1).

the author of this study introduced a slight modification to the track in Neumann et al. (1993) by adjusting their 7 A.M. Sept. 10 position by about 50 miles to the W. in order to account for the 55 mph maximum wind from the S. reported from Nantucket (item 12), which implies that the storm center passed just to the west of that place on Sept. 10 and not to the east as shown in Neumann et al. (1993). A slight adjustment was also considered for the 7 A.M. Sept 6 position in Neumann et al. (1993) in order to fit better a space-time continuity to the estimated Sept. 6 evening position given by the "Francois Arago" (item 3); however, the adjustment was discarded because the author felt that the ship's position was not

Georgia (it should read southeastern Georgia) and was increasing rapidly in intensity. By 8 P.M. Sept. 29 was central over Lynchburg, Va., barometer 29.30 inches, the storm reaching the District of Columbia about 3 hours later. On the morning of Sept 30, the storm center had moved to Lower Michigan, when its course was deflected and it passed to Lake Ontario and the St. Lawrence Valley in a northeast direction. Its passage from Key West to Canada occupied 24 hours, showing a uniform rate of progression of 46 mph. The path of its destruction did not extend more than 50 miles in width in any part of its course. The greatest violence was manifested in Florida during the early morning of Sept. 29. A second period of violence began in Virginia about 9 P.M. Sept. 29 and lasted until midnight (Sept. 29-30) in Pennsylvania. Following a lull, there was a third renewal of intensity during the early morning hours of Sept. 30 in Cayuga and Cortland counties, N.Y. (Garriott, 1900). Author's note: The statement that the storm took 24 hours in moving from Key West to Canada is unrealistic because the storm never passed near Key West; rather, the storm took about 24 hours to move from near Cedar Keys to Canada. 13) Storm of Sept. 28-30, 1896. Major at Cedar Keys, Fl., over 100 killed. Minimal in Georgia and South Carolina. Major in the Middle Atlantic States, 16 killed, damage \$ 3,828,000 (Dunn and Miller, 1960). 14) Some maximum wind velocities as follows: Tampa, S.W. 38 mph on Sept. 29; Jacksonville, S.E. 70 mph on Sept. 29; Savannah, S.E. 70 mph on Sept. 29; Augusta, N. 30 mph on Sept. 29; Charleston, S. 62 mph on Sept. 29; Wilmington, S.W. 42 mph on Sept. 29; Lynchburg, N.W. 34 mph on Sept. 29; Washington, D.C., S.E. 66 mph on Sept. 29; Baltimore, E. 36 mph on Sept. 29; Philadelphia, S.E. 42 mph on Sept. 30; Harrisburg, S. 72 mph on Sept. 30; New York, S.E. 56 mph on Sept. 30; Albany, S.E. 36 mph on Sept. 30; New Haven, S.E. 39 mph on Sept. 30 (Monthly Weather Review, Sept. 1896). 15) Storm of Sept. 22- Oct. 1, 1896. Windward Islands, extreme western Cuba, Florida. Increased in intensity as it reached Florida and moved through Atlantic States, inside the coast line. Center passed over District of Columbia. Principal damage in Florida. Total 7 million dollars, 114 lives lost (Tannehill, 1938). 16) Track for this storm showing the following positions: Sept. 26 (evening), lat. 23.5 N., long. 84.5 W.; Sept. 27 (morning), lat. 24 N., long. 83 W.; Sept. 27 (evening), lat. 24.3 N., long. 82.3 W.; Sept. 28 (morning.), lat. 26.3 N., long. 83 W.; Sept. 28 (evening), lat. 28 N., long. 84 W.; Sept. 29 (morning, lat. 31 N., long. 82.7 W.; Sept. 29 (evening), lat. 37 N., long. 78 W.; Sept. 30 (morning). lat. 50 N., long. 85.5 W.; Sept. 30 (evening) lat. 53 N., long. 79.5 W. (Monthly Weather Review, Sept. 1896). 17) A Sept 1896 storm appeared near lat. 23 N., long. 85 W. and disappeared N. of St. Lawrence Valley (Garriott, 1900). Author's note: A track in Garriott (1900) shows the following daily positions: Sept. 27, lat. 24.7 N., long. 84.3 W.; Sept. 28, lat. 27 N., long. 83 W.; Sept. 29, lat. 31.5 N., long. 82.5 W. 18) A storm was first observed at lat. 16 N., long. 63 W. on Sept. 22, 1896 and lasted 9 days; it recurved at lat. 25 N., long. 86 W. and it was last observed at lat. 50 N., long. 62 W. (Mitchell, 1924). Author's note: For the period Sept. 22-29, the track in Mitchell (1924) was found to be quite similar to the one in Neumann et al. (1993).

known with enough accuracy to merit any change along the storm track. The author's track for Storm 2, 1896 is displayed in Fig. 3.

Wind information in items 6), 8) and 12) was found to support the hurricane status which Neumann et al. (1993) gave to this storm, and the minimum pressure of 28.34 inches recorded on board the "Francois Arago" (item 3) indicated that the storm was a major hurricane.

Storm 3, 1896 (Sept. 18-28), H.

The following information was found in relation to this storm: 1) Minimum pressure at Havana was 756.7 millimeters (29.80 inches) on Sept. 22 (Sarasola, 1928). Author's note: The storm was over 500 miles to the N.E. of Havana on that day. 2) Bark "Harrington" on Sept. 23, in the Gulf Stream, was struck by a gale from N.N.E. which lasted 14 hours (The New York Times, Sept. 30, 1896, p.1, col.5). 3) Bark "Strathmuir" on Sept. 23 hove to under bare poles for 2 hours. She lost and split several sails (The New York Times, Sept. 30, p.1, col.5). 4) The "Castleventy" and the "Manningtry", both from Java, arrived at Delaware Breakwater and reported having encountered a hurricane on Sept. 23 (The Times, London, Sept. 29, 1896, p.8, col.4). 5) Gibraltar, Oct. 17. Barque "Hyden Brow" from New York, reported a hurricane from Sept. 24 to Sept. 29, with loss of some sails and deck fitting (The Times, London, Oct. 19, 1896, p.6, col.5). Author's note: It looks suspicious that the hurricane lasted for 5 days. If the reported hurricane were indeed Storm 3, 1896, it would have probably lasted at the most 2 days (Sept. 24-25). 6) Maximum wind velocities as follows: Hatteras, N. 51 mph on Sept. 23; Kittyhawk, N.E. 58 mph on Sept. 23 (Monthly Weather Review, Sept. 1896). 7) Storm of Sept. 19-29, 1896. Atlantic (Tannehill, 1938). 8) A storm was first observed at lat. 19 N., long. 63 W. on Sept. 19, 1896 and lasted 10 days; it recurved at lat. 27 N., long. 74 W. and it was last observed at lat. 70 N., long. 9 E. (Mitchell, 1924). Author's note: The track in Mitchell (1924) is somewhat similar to the one in Neumann et al. (1993); however, the latter was started one day earlier.

Information contained in the above items was found to support, in general, the track for Storm 3, 1896 which is shown in Neumann et al. (1993). Therefore, such a track was reproduced in Fig. 3.

Strictly speaking, it was not possible to confirm the hurricane status given to this storm in Neumann et al. (1993); however, the use of the word hurricane in items 4) and 5) could be considered as an indicator that this was the case.

Finally, because a) winds as high as 51 mph at Hatteras and 58 mph at Kittyhawk (item 6) were reported nearly 300 miles from the center on Sept. 23 and b) a pressure as low as 29.80 inches was reported from Havana (item 1) nearly 500 miles from the center on Sept. 22, the size of Storm 3, 1896 was indeed very large.

Storm 4, 1896 (Sept. 22-30), H.

The following information was found in relation to this storm: 1) Sept. 25-28, 1896. A cyclone of good intensity passed S. of Cuba, heading to the Gulf of Mexico through the Yucatan Channel on

Sept. 28, where the steamer "Mexico" felt the storm. There were cyclonic winds and showers from Santiago de Cuba to Pinar del Rio. Winds at Cape (San Antonio) were of true cyclonic (hurricane) force. Winds at Havana reached over 60 mph, with heavy showers. There were heavy squalls at Cienfuegos, although they were of short duration. (Sarasola, 1928). Author's note: Actually taken from the catalog of Cuban cyclones by M. Gutierrez-Lanza which is included in Sarasola (1928). 2) The minimum pressure at Havana was 754.8 millimeters (29.72 inches) on Sept. 28 (Sarasola, 1928). 3) There were indications of a tropical storm to the S. of Florida, probably moving to the N.W. Stations in that vicinity were warned that it was not safe to leave port until further notice (The New York Times, Sept. 28, 1896, p.1, col.6). 4) Signals are displayed on the coast, from Jacksonville to Cedar Keys (The New York Times, Sept. 28, 1896, p.1, col.6). 5) The Gulf storm was apparently central to the S.W. of Tampa. Brisk to high winds were reported from the central Gulf coast, but only fresh to brisk winds continue on the South Atlantic coast (The New York Times, Sept. 29, 1896, p.1, col.6). 6) There are indications that there is a storm of considerable energy in the east Gulf, moving to the N.E. (The New York Times, Sept. 29, 1896, p.3, col.7). 7) The "Concho" brought (to New York) the crew of the bark "Saturn" which foundered off Key West on Sept. 28 (The New York Times, Oct. 15, 1896, p.9, col.1). 8) Florida suffered terribly from Tuesday's storm (Sept. 29). The town of Cedar Keys was wiped out and many lives were lost. The Sea Islands off the Carolina coast were directly in the path of the hurricane. It is thought at least two lives were lost there (The New York Times, Oct. 2, 1896, p.1, col.7). 9) Atlanta, Ga. A special to The Constitution from Jacksonville, Fl. said that the West Indian hurricane which entered Florida at Cedar Keys Tuesday morning and swept the state in a N.E. direction left death and destruction in the path.. At 4 A.M. (Sept. 29) the hurricane left water and swooped down on Cedar Keys. After demolishing Cedar Keys, it struck Willinston, a village of 400 inhabitants in Levy County, then the hurricane dashed across Alachua County. At Ft. White, Columbia County, it is reported that 6 persons were killed. Then it dashed across Duval County, its edge striking Jacksonville. At Nassau County, the hurricane seemed to gather additional force and did much damage. From Nassau County, the hurricane passed into Georgia, destroying a logging settlement in Camden County (The New York Times, Oct. 2, 1896, p.1, col.7). 10) Jacksonville, Fl., Oct. 3. The town of Cedar Keys is a total wreck. But few houses were felt standing and most of the 1500 inhabitants of the town were killed or injured. The storm struck the place at 3:30 A.M. (Sept. 29) and continued for several hours. At 4 A.M. it blew a perfect hurricane and suddenly changed to S.E., bringing in a deluge of water, the tide rising 2 feet higher than in the memorable gale of 1884. The immense tidal wave came from the S. Boats, wharves and small houses were hurled from the shore, breaking into fragments, which covered the streets with wreckage and rendered them impassable (The New York Times, Oct. 3, 1896, p.1, col.7). 11) The tropical storm has moved northward with great energy and is now (night of Sept. 29) central over Virginia (The New York Times, Sept. 30, 1896, p.1, col.6). 12) By Sept. 29 it (the storm) had entered southwestern

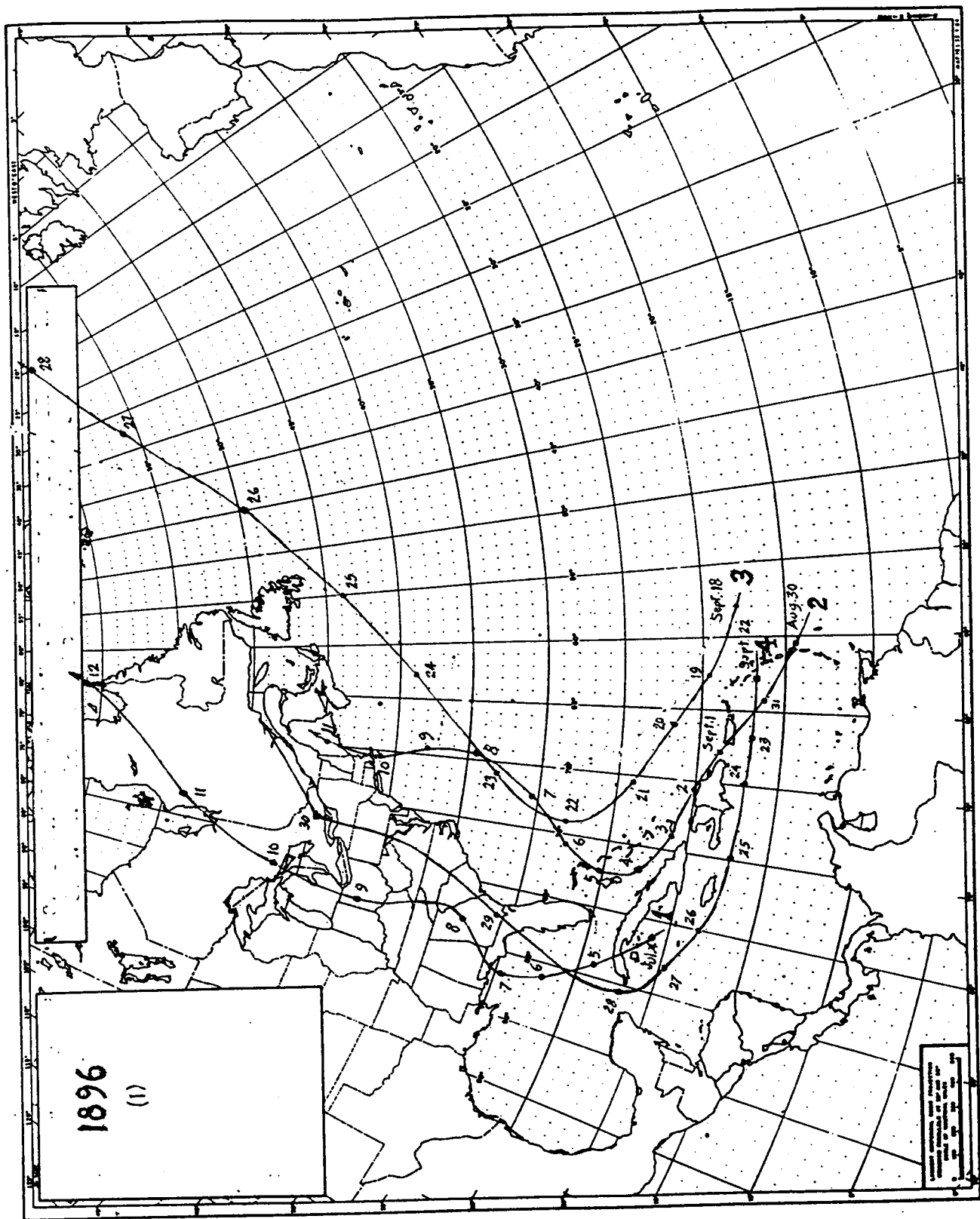


Fig. 3.

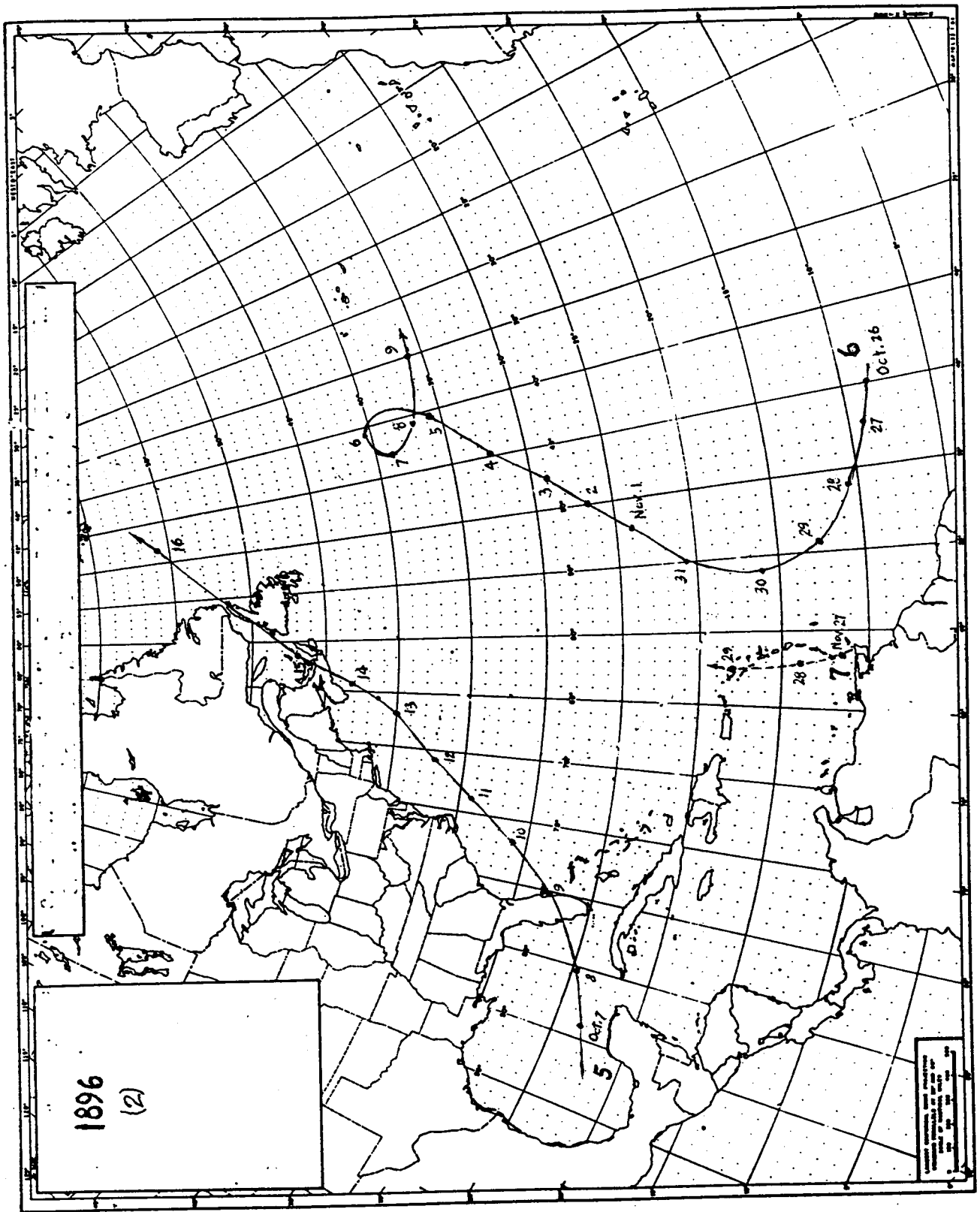


Fig. 3. (continued).

The information which is contained in the above items suggested some modifications along the storm track displayed in Neumann et al. (1993). The author of this study estimated new 7 A.M. positions for Sept. 27-28 in order to fit information in item 1) in regard that the storm passed through the Yucatan Channel on Sept. 28, where the steamer "Mexico" felt it and that winds at Cape San Antonio were of true cyclonic force (item 1); the estimated 7 A.M. positions were near 19.7 degrees N. 83.7 degrees W. for Sept. 27 and 22.3 degrees N., 85.5 degrees W. for Sept. 28, and such positions were found to be about 120 and 180 miles to the S.S.E. and S. of the respective positions in Neumann et al. (1993). Based on information that on Sept. 30 the storm was deflected to the N.E. and moved over Lake Ontario and the St. Lawrence Valley (item 12), the author of this study decided to extend to Sept. 30 the track in Neumann et al. (1993) by estimating a 7 A.M. Sept. 30 position near 45.0 degrees N., 77.0 degrees W. and by terminating the track near the mouth of the St. Lawrence River. It should be noted that an Oct. 1 position in Mitchell (1924), which is the last observed storm's location in item 18), was not used in extending the track. The author's track for Storm 4, 1896 is shown in Fig. 3.

Information in a number of the above items was found to support the hurricane status that Neumann et al. (1993) attributed to this storm, and information in item 13) specifically stated that it was a major hurricane in Florida and in the Middle Atlantic States.

Storm 5, 1896 (Oct. 7-16), H.

The following information was found about this storm: 1) There is some indication of a storm far to the S. of the Gulf coast, apparently central in the middle Gulf (The New York Times, Oct. 9, 1896, p.1, col.6). Author's note: This statement should have been issued the night before its publication date. 2) The conditions continue threatening in the east Gulf and on the South Atlantic coast, although no storm is yet in sight. Dangerous gales are anticipated for the South Atlantic and Florida coast on Saturday (Oct. 10). Vessels leaving port are likely to encounter dangerous gales off the Virginia and North Carolina coasts (The New York Times, Oct. 10, 1896, p.1, col.6). Author's note: This statement was probably issued the night before its publication date. 3) The tropical storm is probably central to the S. of Hatteras and the wind has reached a velocity of 60 mph from the N.E. at Cape Henry. Indications are that the storm will move northward during the next 24 hours, carrying dangerous winds on the Atlantic coast States north of North Carolina (The New York Times, Oct. 11, 1896, p.1, col.6). 4) Washington, Oct. 10, 8 P.M. Storm signals are displayed on Chesapeake Bay and on the Florida coast from Jupiter to Cedar Keys. Hurricane signals are displayed from Boston to Jacksonville (The New York Times, Oct. 11, 1896, p.7, col.4). 5) Off the North Carolina coast Saturday (Oct.10) the storm center had moved only to Virginia in 24 hours and kept so far off that its edge extended only a few miles inland. The coasting steamships "Tallahassee" and "Goldsboro" selected to go out of New York this morning , but they encountered the northeaster blowing at 42 mph at Sandy Hook and

anchored in the lower bay. Late last night the instrument at Sandy Hook registered 45 mph, but at times the blow reached hurricane force (The New York Times, Oct. 12, 1896, p.1, col.4). 6) The tropical storm is moving very slowly to the northward and continues central off the North Carolina coast. It increased greatly on the New England coast and winds of hurricane velocity were reported last night from Virginia northward to southern New England, attended by rain (The New York Times, Oct. 12, 1896, p.1, col.6). 7) Washington, Oct. 11, 8 P.M. Hurricane signals are displayed from Boston to Morehead City (The New York Times, Oct. 12, 1896, p.3, col.3). 8) The center of the storm has reached the latitude of New York but the city did not get the worst of it. In Boston, it reached 52 mph while at Block Island it developed the almost phenomenal velocity of 80 mph. In this city (New York) the maximum wind was 38 mph and the temperature varied from 48 to 52 degrees Fahrenheit (The New York Times, Oct. 13, 1896, p.1, col.7). 9) The West Indian hurricane is now central off the south New England coast and dangerous gales continue from Atlantic City to Eastport (The New York Times, Oct. 13, 1896, p.1, col.6). Author's note: This statement was probably issued the night before its publication date. 10) The West Indian hurricane is moving slowly to the N.E. and is now central S.E. of New England. Northerly gales continue on the southern New England coast (The New York Times, Oct. 14, 1896, p.1, col. 6). Author's note: This statement was probably issued the night before its publication date. 11) The steamship "El Mar" brought in to New York the captain and 6 of the crew of the schooner "Luther M. Reynolds". The "Reynolds" left Brunswick, Ga. on Sept. 30 for Elizabeth, N.J. She ran into the gale on Oct. 10 off Cape Romaine, but succeeded in beating up the Winter Quarter Lightship, when the wind increased in velocity until it became a hurricane. The vessel was headed off shore for 8 hours and finally hove to under close-reefed main sail and spanker. There was no abatement of the wind. Great waves were washing over the vessel and gradually the deck head was carried away. The schooner was waterlogged and in a sinking condition when the captain and crew were rescued 9 miles S.E. of Hatteras Shoals on Monday morning, Oct. 12 (The New York Times, Oct. 15, 1896, p.9, col.10). 12) The steamer "St. Hubert" put into New York yesterday disabled. She sailed from Philadelphia for London last Friday (Oct. 9) . During the hurricane, she was swept fore and aft by the heavy seas (The New York Times, Oct. 15, 1896, p.9, col.1). 13) The steamer "Oxus" sailed from Port Maria on Oct. 7 at arrived yesterday (at New York). She experienced very rough weather on Oct. 10-11. On Oct. 10 during the S.W. gale a seaman disappeared and is supposed to have been washed overboard (The New York Times, Oct. 15, 1896, p.9, col.1). 14) The captain and crew of schooner "Henry Southern", abandoned at lat. 34 33 N., long. 72 03 W. on Oct. 15, was brought to New York by the steamer "New York" from Southampton. The rescue was made by steamship "Beitor" which arrived at Plymouth on Nov. 3. The "Southern" sailed from Bonair, Martinique on Sept. 5. All went well until Oct. 11 when she was about 30 miles from Hatteras and a gale sprang up. It continued next day and the schooner began to make water. At 9 A.M. Oct. 15 two boats were provisioned and all hands put off. They were picked up on the afternoon of Oct. 15 by

the "Beitor" (The New York Times, Nov. 18, 1896, p.9, col.6). 15) Some maximum wind velocities were as follows: Hatteras, N. 67 mph on Oct. 11; Kittyhawk, N.E. 72 mph on Oct. 11; New Haven, N.E. 41 mph on Oct. 12; Block Island, 78 mph on Oct. 12; Nantucket, 60 mph on Oct. 12; Boston, N.E. 50 mph on Oct. 12 (Monthly Weather Review, Oct. 1896). Author's note: Second maximum wind velocities of 80 mph at Block Island on Oct. 12 and of 52 mph at Boston on Oct. 12 were published in the Monthly Weather Review, Oct. 1896. 16) Storm of Oct. 8-13, 1896. Minimal at Ft Myers, Fl. on Oct. 8. Minor at Virginia Capes on Oct 10-11, the center remaining off the coast. Minimal on the coast of Rhode Island and Massachusetts on Oct. 12-13 but more severe off the coast (Dunn and Miller, 1960). 17) Storm track showing the following positions: Oct. 9 (morning), lat. 26.5 N., long. 77 W.; Oct. 10 (morning), lat. 30.5 N., long. 78 W.; Oct. 11 (morning), lat. 35.3 N., long. 74 W.; Oct. 12 (morning), lat. 36.5 N., long. 70.3 W.; Oct. 13 (morning), lat. 38.7 N., long. 68 W.; Oct. 14 (morning), lat. 43.7 N., long. 64.1 W.; Oct. 14 (evening), lat. 41 N., long. 71 W.; Oct. 15 (morning), lat. 39.5 N., long. 69.5 W.; Oct. 15 (evening), lat. 42 N., long. 67.5 W.; Oct. 16 (morning), lat. 46 N., long. 63 W.; Oct. 16 (evening), lat. 48 N., long. 64 W.; Oct. 17 (morning), lat. 51 N., long. 63.5 W. The minimum pressure shown along the track was 29.10 inches in the morning of Oct. 13 (Monthly Weather Review, Oct. 1896). Author's note: This track was started in the Atlantic east of Florida on Oct. 9 while the one in Neumann et al. (1993) was started in the central Gulf of Mexico two days earlier. 18) A storm was first observed at lat. 22 N., long. 92 W. on Oct. 7, 1896 and lasted 9 days; it was last observed at lat. 56 N, long. 48 W. (Mitchell, 1924). Author's note: A storm track in Mitchell (1924) is very similar to the one displayed in Neumann et al. (1993).

Most information in the above items was found to support the track for Storm 5, 1896 in Neumann et al. (1993). Therefore, such a track was reproduced in Fig. 3.

The hurricane status which Neumann et al. (1993) attributed to this storm was verified in the light of wind information in items 6), 8) and 15) and pressure information in item 17).

Temperatures between 48 and 52 degrees Fahrenheit recorded at New York during the storm (item 8) showed that the storm was embedded in a quite cool environment, and should have been in the process of becoming extratropical as it progressed northward to high latitude.

Storm 6, 1896 (Oct. 26- Nov. 9), H.

Very little information was found in relation to this storm: 1) A storm was first observed at lat. 8 N., long. 45 W. on Oct. 26, 1896 and lasted 14 days; it recurved at lat. 16 N., long. 56 W. and it was last observed at lat. 36 N., long. 35 W. (Mitchell, 1924). Author's note: A track for this storm in Mitchell (1924) is very similar to the one in Neumann et al. (1993). 2) Bark "Gerald C. Tobay" arrived yesterday from Honkong. She encountered a squall Oct. 28 in lat. 21 12 N., long. 62 30 W. It came in a whirlwind with rain, thunder and lightning and lasted only 20 minutes, but in that time it whipped away the courses, the upper and lower foretop

sails, the staysails and split all the remaining canvas (The New York Times, Nov. 11, 1896, p.9, col.6). Author's note: This weather might not be related to the storm because it was reported to have occurred about 800 miles to the N.W. of the Oct. 28 storm location in Neumann et al. (1993). If the weather felt by the bark were indeed related to the storm, it would imply a very unusually large size for it, causing the violent squalls to extend some 800 miles to the N.W. of the storm center.

The track for Storm 6, 1896 in Neumann et al. (1993) was accepted in the light of information in item 1) and reproduced in Fig. 3. However, as there were no marine data near the storm's path in the items above, the track could not be independently checked.

The hurricane status given in Neumann et al. (1993) could not be checked, but it was kept unchanged by the author of this study.

Storm 7, 1896 (Nov. 27-29), T. S.

This is a new storm which is not included in Neumann et al. (1993) and which the author of this study has recently documented. Strictly speaking, however, this is not a new storm case since it has been mentioned before by Tannehill (1938).

Documentation of this storm was based on the following information: 1) Storm of Nov. 27-29, 1896. Leeward Islands (Tannehill, 1938). 2) Kingston, Jamaica, Dec. 3. Advices received here today show that a disastrous cyclone passed over the Windward and Leeward Islands. The wind blew with terrific violence and was accompanied by a heavy rainfall. The many mountain streams of the various islands were soon transformed into torrents and swept into and over the valleys carrying everything before them. From the advices now at hand, it appears that the islands of St. Vincent and Monserrat suffered severely. A number of sugar, coffee and cotton estates were inundated and in some cases the entire crops were torn out by the roots and carried into the sea. Many of the persons drowned were living in the vicinity of the watercourses and also had little or any warning of the approaching floods. Immense damage to property was also done by floods in the islands of Trinidad and Barbados (The New York Times, Dec.4, 1896, p.5, col.4). 3) London, Dec. 3. The Colonial Office has received a dispatch from Plymouth, the capital of Monserrat, stating that 75 persons in that island perished in a cyclone that passed over the Windward and Leeward Islands (The New York Times, Dec. 4, 1896, p.5, col.4). 4) A telegram has been received at the Colonial Office from the Officer Administering the Government of the Leeward Islands reporting that serious floods have occurred in the island of Monserrat, resulting in the loss of 75 lives and the destruction of roads and bridges, and stating that further details are being reported by post (The Times, London, Dec. 4, 1896, p.5, col.6). 5) Mr. F. H. Watkins, Inspector of the Schools for the Leeward Islands wrote from Richmond, Monserrat on Dec. 8: On the night of Nov. 28 a storm cloud burst and wrought havoc and desolation over two-thirds of the island. Carriage roads became roaring torrents and lime-fields and cane pieces, lakes. Frequent earthquakes contributed to the destruction. At the south end of Plymouth, the chief town, the water rose above the bridge, which was ultimately swept away as

were all the other bridges in the island except one; and about daybreak (Nov. 29) it was found that about 50 persons have been carried out into the sea beyond all hope of recovery. Many of those leaving near the scene of catastrophe had marvelous escapes and survived only to know that they had lost everything they possessed (The Times, London, Dec. 25, 1896, p.8, col.5). 6) Guadeloupe. Dec. 11. Only the first mate was saved from the ship "Grecian", previously reported wrecked at Monserrat (The Times, London, Dec. 12, 1896, p.12, col.4).

After a careful analysis of information in all of the above items, the author of this study prepared a track for Storm 7, 1896. The author's track was started with a 7 A.M. Nov. 27 position which was estimated near 11.5 degrees N., 61.5 degrees W. on the basis that Nov. 27 was the first day of the storm life-span given in item 1) and that the storm produced extensive flooding as far south as Trinidad, Barbados and St. Vincent (item 2). The author's 7 A.M. Nov. 28 position was estimated near 14.0 degrees N., 62.0 degrees W., primarily on the basis of space-time continuity which permitted the storm to have been in the vicinity of Monserrat during the night of Nov. 28, when the tremendous downpour and flooding occurred there (item 5). The author of this study estimated the storm center to have been near 18.0 degrees N., 62.5 degrees W. at 7 A.M. Nov. 29 on the basis of the apparently improving condition at Monserrat by daybreak Nov. 29 when "it was found that about 50 persons have been carried out into the sea beyond all hope of recovery" (item 5). The author's track for Storm 7, 1896 is displayed in Fig. 3.

On the basis that no hurricane winds were reported in the above items, the author of this study decided to give a tropical storm status to Storm 7, 1896.

Special statement.

In addition to the storms which were discussed for the year, one other possible case was found for 1896.

A) Case of Aug. 28-29, 1896.

The following information was found about this possible case: 1) The schooner "John H. May" which left Jacksonville on Aug. 23 took a heavy N.E. gale off Frying Pan Shoals, S. of Hatteras. The storm began on Aug. 28 and Capt. Burrough was obliged to heave on the port tack, with a single reef in the mainsail and double reef in the foresail. The laboring of the ship caused the cargo to shift and when two men were wedging the deck load the following morning a heavy wave struck the schooner with terrific force. The wave seemed to be a cumulative one and the captain said it was about 30 feet high and 60 feet long (The New York Times, Sept. 7, 1896, p.8, col.5). This system was considered as a candidate to be associated to a tropical storm, but the true nature of the weather system it was associated with could not be determined with a reasonable degree of confidence, and no motion for it could be inferred on the

basis of the information above. This is why this weather system was

kept in the category of possible cases and not included as a tropical storm.