

NORTH ATLANTIC STORMS FOR JUNE, 1892 (pressure in inches and millimeters; wind-force by Beaufort scale).

The paths of storms that appeared over the west part of the north Atlantic Ocean during June, 1892, are shown on Chart I. These paths have been determined from reports of observations by shipmasters received through the co-operation of the Hydrographic Office, Navy Department, and the "New York Herald Weather Service."

The north Atlantic normal pressure for June is highest in an area extending from the Azores southwestward to the 50th meridian, where it is above 30.20 (767); it is lowest from southern Greenland over Iceland, where it is below 29.80 (757). There is usually an increase of pressure over southern and eastern parts of the ocean, and a decrease from the region south of Newfoundland and Nova Scotia to Iceland and Greenland. The greatest increase occurs from the Azores and Madeira Islands to the Spanish Peninsula, where it exceeds .05 inch, and the most marked decrease is shown from Newfoundland to western Iceland and Greenland, where it is more than .05 inch.

The principal track of June storms is traced from Newfoundland east-northeast to the 20th meridian, where the track divides, one part passing over Scotland and the other south-eastward over France. A less frequented track is traced from Labrador to Iceland and thence over Scandinavia. The average velocity of north Atlantic storms for June is 16 statute miles per hour, the velocity for May and June being the lowest noted for the year. In June an average of one storm per month traverses the north Atlantic Ocean from the American to the European coasts.

In June, 1892, the weather was unusually unsettled over the western part of the ocean and at least three storms, low areas IV, VIII, and IX, traversed the ocean. The morning of the 2d low area I occupied the Gulf of Saint Lawrence, with pressure 29.80 (757). By the 3d this storm had advanced to mid-ocean, with pressure below 29.40 (747) and west gales reaching force 10. On the 4th the center reached the 20th meridian, with pressure below 29.20 (742) and southwest to west gales of force 8 to 10. By the 5th the storm had apparently recurved to the westward over mid-ocean where it remained during the 6th, with an apparent loss of energy, and from thence apparently shifted position to the region north of the Grand Banks, where it remained nearly stationary until the 9th.

The night of the 9th low area III passed off the New Jersey coast with pressure below 29.80 (757), and the morning of the 10th was central south of Nova Scotia. By the 11th the storm-center had advanced to the southern edge of the Banks of Newfoundland, with pressure about 29.70 (754), and by the 12th had passed northward over east Newfoundland with an apparent increase of strength. Moving eastward to mid-ocean by the 14th, the center of disturbance disappeared north of the region of observation after the 15th.

During the 14th low area IV moved southeast over the Gulf of Saint Lawrence, with pressure below 29.60 (752), and the morning of the 15th was located between Newfoundland and Cape Breton Island; from which position it advanced east to Newfoundland by the 16th, with pressure below 29.70 (754) and west to west-northwest gales of force 8 to 9. Moving slowly eastward the center reached the 40th meridian on the 17th, remained nearly stationary over mid-ocean until the 21st, with pressure below 29.60 (752) and westerly gales of force 7 to 9 on the 20th, and apparently disappeared over the British Isles on the 23d.

The night of the 20th-21st low area VIII passed northeast from the region south of Nova Scotia over southern Newfoundland, with pressure below 29.20 (742). Remaining nearly stationary in that region with an apparent decrease of energy, the storm passed to mid-ocean by the 24th, and reached the British Isles on the 25th with pressure below 29.50 (749). The night of the 23d-24th low area IX advanced from south New England to Newfoundland, with pressure below 29.50 (749), reached mid-ocean on the 25th, with pressure below 29.40 (747)

and northwest gales of force 9, and disappeared north of the British Isles after the 26th.

Morning reports of the 10th showed a cyclonic area central southwest of Key West, Fla. By the evening report of that day the storm was apparently central over the southeast part of the Gulf of Mexico, with pressure below 29.70 (754), and by the morning of the 11th it had crossed the southern part of the Florida Peninsula and was central over or near the Bahama Islands, after which its course cannot be traced from reports received. The passage of this storm was attended by heavy rain and high wind over southern Florida. At Jupiter, Fla., rain continued throughout the 10th and 11th with northeast winds reaching a velocity of 36 miles per hour. The commander of the steamship "Mascotte" reports that at noon June 10th, when 43 miles north by west from Northwest Passage Lighthouse, the wind veered around the compass and then continued heavy from the south and southwest to Key West. The lowest barometer noted was 29.67 (754), at 4 p. m., 10th, when in N. 25° 17', W. 81° 54'.

The most important storm of the current month was the West India cyclone which advanced from the Virgin Islands, West Indies, to Newfoundland from the 16th to the 22d. This storm recurved east of the Bahamas, and passed west of Bermuda, its influence extending to the coast of the United States only in the form of high tides and heavy surf from the Carolinas to New Jersey. Two storms, low areas II and IV, traversed the ocean from coast to coast, the period of transit being in each instance 5 days. The influence of the West India cyclone referred to was also felt over the northern part of the British Isles from the 25th to the 28th.

The month opened with high pressure and fine weather from coast to coast. These conditions continued until the 5th, when low area I passed north of the Gulf of Saint Lawrence. This storm was followed the night of the 6th by low area II, which reached northern Newfoundland the morning of the 7th. On the 8th this storm occupied the region north of the Banks of Newfoundland, and by the 9th had advanced to the 40th meridian in high latitudes. Moving slowly eastward the storm-center reached the ocean west of Ireland on the 12th, with pressure below 29.70 (754). On the 13th pressure below 29.20 (742) and west gales of force 8 were reported east of the 25th meridian, and on the 14th west to northwest gales of force 8 to 10 were encountered between the 10th and 15th meridians. During the 15th this storm passed north of the British Isles.

The afternoon of the 16th the weather was threatening at Saint Thomas, W. I., and the barometer fell to 29.80 (757), a fall of .22 inch in 48 hours. At 7 a. m. of the 17th the barometer at Saint Thomas stood at 29.80 (757), with west wind and heavy rains. A report from Tortola stated that the cyclone passed that place at 9 a. m. During the 18th and 19th the storm recurved east of the Bahamas, and at 5 p. m. of the latter-named date the barometer had fallen to 29.91 (760), with southeast wind of force 4 at Bermuda. During the early morning of the 20th the center of disturbance moved northward west of Bermuda. At that station the barometer fell to 29.71 (755) from 4.30 to 6 a. m., with southwest wind of force 8. Moving thence north-northeast the storm-center reached Newfoundland on the 22d, attended by northwest to north gales of hurricane force along the trans-Atlantic steamship routes between the 50th and 65th meridians. Moving eastward over the ocean in high latitudes this storm apparently passed north of Scotland on the 25th.

The following extracts from the reports of shipmasters indicate the character of this storm: August 15th, German s.s. "Francia," in N. 26° 23', W. 54° 16', wind southeast, force 4 to 8, barometer 30.16 (766) to 30.08 (764), heavy sea and swell from southeast to south; 16th, in N. 21° 39', W. 57° 22', wind southeast to south, force 4, barometer 30.12 (765) to 30.08 (764), heavy swell and sea, shipped much water; 17th, in N. 21° 39', W. 60° 07', wind southeast, force 4 to 9, barometer 30.04 (763), heavy sea, ship labored heavily, shipping much water, wind shifted to south and southwest; 18th, in N. 19° 15', W. 61° 52', wind south, force 3 to 6, barometer 30.12 (765), heavy south to southwest sea moderating.

The British s.s. "Duart Castle" left Bermuda for Saint Thomas the morning of the 16th, with light south-southeast wind; 17th, in N. 27° 48', W. 65° 42', wind east; 4 p. m., fresh breeze and threatening weather; 8 p. m., every indication of a cyclone, heavy wind squalls and sea rising. 18th, in N. 24° 19', W. 65° 22', wind east, barometer 29.85 (758); 8 a. m., hove to, heavy gale and high sea; noon, gale increasing, with high cross seas; 4 p. m., gale increasing and hauling to south and southeast; 8 p. m., gale blowing with increasing violence;

8 to 10 p. m., ship labored heavily and shipped great quantities of water, one lifeboat stove in and others started from their chocks, tarpaulins, hatches, and deckload shifted, injuring 6 men. 19th, in N. 25° 01', W. 66° 09', in morning, shipped heavy seas, which caused considerable damage, and ship listed 12° to starboard; at 2 p. m. resumed course.

On the 16th low area IV advanced over Newfoundland, and on the 17th was central north of Newfoundland, with pressure below 29.70 (754). By the 19th this storm had moved to mid-ocean, with pressure about 29.50 (749) and north to northwest gales of force 9 to 11 near the 40th meridian, and on the 20th gales of force 8 were encountered near the 30th meridian. From the 21st to 23d the storm apparently moved slowly eastward over the British Isles.

The night of the 25th low area VII passed southward off the south New England coast, this abnormal course being caused by high pressure to the eastward. By the night of the 26th the storm-center had been forced southward off the Virginia coast, and by the morning of the 27th had recurved northward off the New Jersey coast. During the next 24 hours the storm remained nearly stationary off the New England coast, and by the 29th apparently dissipated south of Nova Scotia. On the 27th a storm of marked strength appeared over mid-ocean, with pressure below 29.40 (747), and northerly gales of force 9 to 10 between the 30th and 40th meridians. This storm moved slightly to the southeastward by the 28th, and north-northeast gales of force 8 were encountered near the 20th meridian. By the 29th the center of disturbance had advanced southwest of the British Isles, and gales of force 8 to 11 were reported east of the 20th meridian. During the 29th and 30th this storm apparently moved eastward over the southern part of the British Isles.

IV.—The presence of an area of low pressure of tropical origin over the central part of the Gulf of Mexico was indicated by reports of the 11th. On that date the 12-hour decrease of pressure was more than .10 inch from the lower lakes to the east Gulf coast, and heavy rain fell at points along the Gulf coast. Morning reports of the 12th showed a 24-hour decrease of pressure of .10 to .20 inch over the east Gulf states, and during the 12 hours ending 8 p. m. the pressure decreased .10 to .18 inch from the middle Gulf coast to New England. At the evening report of the 12th the storm was central near New Orleans, La., and high wind and heavy rains were noted on that date along the Gulf coast. The morning of the 13th the disturbance was central over Kentucky, with pressure below 29.60, and at the evening report the center had passed to eastern Lake Erie, with pressure below 29.40. On that date rain fell generally east of the Mississippi River, severe local storms occurred from the lower lakes and New York over the Carolinas, and heavy gales, reaching a velocity of 54 miles per hour from the northwest at Cleveland, Ohio, prevailed over the central and eastern lake regions.

At the morning report of the 14th the center was near Parry Sound, Ont., and during the day it moved slowly northeastward, with an apparent loss of energy. Heavy wind continued over the lower lakes, and strong gales prevailed over Long Island Sound. The rain area contracted over the northeastern part of the country, and high area IV, which had remained nearly stationary over the Western States from the 11th to the 14th, passed southeastward to the middle Mississippi valley. Moving slowly north of east this low area disappeared north of the Gulf of Saint Lawrence during the 16th.

of 50 miles per hour from the northeast was reported at New Orleans, La. During the 23d the low area recurved north and east off the middle Gulf coast, and the rain area extended northeastward to the middle Atlantic coast. On the 24th the center of disturbance moved eastward over the Florida Peninsula, with heavy rain in eastern Florida and along the Georgia and South Carolina coasts, after which it apparently moved northeastward off the Atlantic coast, attended by high wind and heavy rain, reaching the New England coast the evening of the 26th and the lower Saint Lawrence valley the morning of the 27th.

gales occurred
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VII.—A dispatch from Habana, Cuba, dated 10.10 p. m., 21st, stated that a cyclonic disturbance increasing in energy was recurving southwest of that place and would cross western Cuba. The presence of this low area over the Gulf of Mexico was indicated by reports of the 22d. On that date heavy rain fell on the middle Gulf coast, and a wind velocity

NORTH ATLANTIC STORMS FOR OCTOBER, 1892.

[Pressure in inches and millimeters; wind-force by Beaufort scale.]

The paths of storms that appeared over the west part of the north Atlantic Ocean during October, 1892, are shown on Chart I. These paths have been determined from reports of observations by shipmasters received through the co-operation of the Hydrographic Office, Navy Department, and the "New York Herald Weather Service."

October usually marks the commencement of the stormy season in the middle latitudes of the north Atlantic. There is a general decrease of atmospheric pressure over the ocean, save from the British Isles over the northern ocean between Iceland and the Norwegian coast, the Iceland low area extends southward with a decrease of central pressure, and storms from the west part of the north Atlantic and from the American continent have a comparatively unobstructed path to the middle and north coasts of Europe. Reports of preceding years show that an average of two storms per month traverse the north Atlantic from America to Europe in October, and that their average rate of advance in that month is 21 statute miles per hour. Storms of tropical origin are not uncommon in October. The West India cyclones of that month generally appear over the Caribbean Sea and recurve over or near extreme western Cuba. October storms of this class have averaged about one in 2 years.

Generally unsettled weather prevailed over the north Atlantic during October, 1892. Over the British Isles the month was cold and wet. Over mid-ocean severe and persistent storms were encountered during the second and third decades of the month. Over the western part of the ocean there was a succession of storms of marked energy, an unusual number of which were of tropical or sub-tropical origin.

The month opened with generally stormy weather from coast to coast. Low area VIII for September, 1892, occupied the region northeast of the Grand Banks, the pressure was low over the Gulf of Saint Lawrence, a storm was apparently developing east of the Bahamas, and the barometer was low over the British Isles. On the 2d the September low area VIII had apparently recurved westward and united with the low area from the Gulf of Saint Lawrence, the storm from the vicinity of the Bahamas had moved northeastward to a position south of Bermuda, and the pressure continued low over the eastern part of the ocean. The morning of the 3d the low areas over the western part of the ocean had apparently united south of Newfoundland, where pressure below 29.50 (749) and northwest gales of force 9 to 10 were reported. By the morning of the 4th this storm had apparently recurved westward and joined low area I on the New England coast. During the next two days this storm occupied the Gulf of Saint Lawrence, with pressure below 29.20 (742) on the 6th, after which it moved northeastward over Labrador.

A storm of marked strength moved westward along the Venezuela coast of the Caribbean Sea from the 6th to the 8th, and apparently passed thence westward to Honduras by the 11th, and possibly to the Mexican coast by the 15th. On the 7th very heavy rain fell on the Island of Trinidad, with high west winds, which shifted to southeast and increased to a gale at 4.15 p. m.; 5 lighters were sunk; streams overflowed their banks, causing a suspension of railroad traffic and doing considerable damage to property. At La Guayra the storm was very severe the afternoon of the 7th; vessels were obliged to leave port on account of the tremendous seas. On the 8th the wind was very strong from the east, with rough sea at Curacao Island. On October 11th a severe hurricane of short duration struck the Bay Islands off the north coast of Honduras, causing serious damage to plantations, build-

ings, and shipping. The schooner "Stranger" went down off Cape Gracias, with a loss of 16 passengers. On the 15th a destructive storm was reported along the Mexican coast; vessels in the port of Vera Cruz dragged anchor, and many buildings were destroyed.

On the 9th low area II passed south of Nova Scotia, thence northeastward over Newfoundland by the 10th, and reached mid-ocean in high latitudes on the 11th. Over the British Isles the pressure continued low during the first decade of the month, with gales of considerable force and copious rains. From the 11th to the 13th the pressure was low north of Newfoundland and the Grand Banks. This low area moved to mid-ocean where it remained nearly stationary from the 14th to the 17th, with pressure below 29.30 (744) and northerly gales of force 9 to 10 on the 16th, after which it recurved westward and united with a storm from the southwest.

Reports of the 13th indicated the development of a storm of marked energy east of the Bahamas, and in the afternoon gales of hurricane force were encountered between Bermuda and the Bahamas. On the 14th this storm was central south of Bermuda, and pressure below 29.70 (754) and north-northeast gales of force 9 were reported in that region. During the 15th, 16th, and 17th the storm pursued a slow northeasterly course and on the 17th was central east of Bermuda. About 3 p. m. of that date a tornado passed across the eastern part of Saint Georges Island, Bermuda. The disturbed surface of the sea clearly indicated the track of the tornado as it approached the island. This storm was not felt at Hamilton.

By the morning of the 18th the low area had reached a position off the southeast edge of the Grand Banks, and by the morning of the 19th was central off the northeast edge of the Grand Banks. During the 20th this storm united over the Banks of Newfoundland with low area V. On that date the barometer fell below 29.00 (736), and gales of force 9 to 11 were reported east of Newfoundland. From the 20th to the 24th the pressure continued low in the region of Newfoundland and the Grand Banks. By the 25th the storm-center had advanced to mid-ocean where it remained nearly stationary during the 26th, with very low pressure, a reading of 28.20 (716) being noted by the steamship "Pennsylvania," in N. 50° 33', W. 29° 03' on the 26th, with gales of force 8 to 10. This storm apparently reached the British Isles on the 28th.

From the 14th to the 16th a storm of considerable strength was apparently central south of the British Isles. The rains of this period were very heavy in the eastern counties of England. In York the greatest flood in 60 years occurred along the River Ouse; upwards of 500 houses were damaged. On the 25th low area VII was central north of the Bahamas, with pressure below 29.70 (754). By the morning of the 26th the storm had moved northeastward between the Carolina coast and Bermuda, and the morning of the 27th was central on the southwest edge of the Banks of Newfoundland. By the morning of the 28th the center of disturbance had apparently moved northwestward and united with low area VIII which moved eastward north of the Gulf of Saint Lawrence. On that date a new development appeared between Bermuda and the Carolina coast and moved rapidly northeastward to eastern Nova Scotia by the morning of the 29th, with pressure 29.30 (744) and gales of force 9 to 12, and by the 30th had advanced north of the Banks of Newfoundland, where it was central at the close of the month with pressure below 29.20 (742) and strong gales east of Newfoundland.