

HURRICANES OF 1917.

By CHARLES A. DONNEL, Meteorologist.

[Dated: Weather Bureau, Washington, D. C., Feb. 3, 1918.]

Fewer storms than usual, of tropical origin, occurred during the year 1917. In fact only one disturbance that could be classed as a hurricane of the first magnitude viz, September 22-30, came within the field of our observations. However, it has seemed proper to include four storms in the present category, and their paths have been traced on Chart X (XLV—121) of this issue of the MONTHLY WEATHER REVIEW.

Storm of August 9.—Information concerning this storm is extremely meager. What at the time was believed to be a secondary center of a barometric depression moving eastward near the mouth of the St. Lawrence River appeared off the North Carolina coast. Later advices seem to disclose that this storm was of tropical origin, having formed east of the Virgin Islands and passing thence northwestward to the position charted on August 9.

Storm of September 4.—On September 4 a storm appeared south of the Bermuda Islands as shown by the weather report from Hamilton. The pressure was 29.46 inches with a wind of gale force and rain. The center of the disturbance passed to the eastward and northward of the islands some time between 12 o'clock noon and 4 p. m. the same date. No further facts in reference to this storm have been received.

Storm of September 13-18.—The second tropical storm of September made its first appearance as a definite disturbance on the morning of September 13 over eastern Cuba. During the following 24 hours the center moved northward to a position off the eastern coast of Florida. From that point the storm advanced north-eastward and by the night of September 17-18 was off Cape Cod. It continued its northeastward movement and passed beyond Newfoundland on September 20.

Storm of September 22-30.—This storm may be classed as a hurricane of the first magnitude. It first showed true cyclonic characteristics on September 22 south of Haiti, advancing thence in a general west-northwesterly direction to a position off the mouth of the Mississippi River whence it recurved sharply to the northeastward and entered the United States near Pensacola, Fla. Dissolution began soon after the storm struck the land and by the morning of September 30 the remnants had disappeared over southeastern Georgia. Articles descriptive of this hurricane appear in the REVIEWS for September and October, 1917. The few additional facts that have come to hand since the articles referred to were prepared, serve to furnish evidence as to the hurricane's great

intensity throughout virtually its entire existence. The center of the track crossed Jamaica and great destruction was caused on that island, the banana industry having been almost wiped out. Mr. O. L. Fassig, Meteorologist, U. S. Weather Bureau, who visited the Isle of Pines shortly after the passage of the hurricane there, states that the town of Nueva Gerona was devastated, many of the staunchest structures in the town having been leveled. Three apparently reliable barometer readings at that point indicated a minimum of 27.70 inches about 1 p. m. of September 25. In the Pinar region of western Cuba orchards and other crops were ruined. It is thought that a special report by Mr. Fassig on this storm will be prepared later on.

SECTION III.—FORECASTS.

FORECASTS AND WARNINGS FOR SEPTEMBER, 1917.

By H. C. FRANKENFIELD, Supervising Forecaster.

[Dated: Weather Bureau, Washington, D. C., October 1, 1917.]

On the morning of the 10th there were some slight evidences of the formation of a disturbance over the west Caribbean Sea and of another at about latitude 14°N. , longitude 64°W. Special observations were requested and the usual advices issued. The situation was kept under careful observation during the ensuing four days of moderately low pressure, but no storm of consequence developed, although on the morning of the 13th there was a moderate but clearly defined circulation over southeastern Cuba. However by this time the barometer was falling rapidly along the South Atlantic coast with increasing northeast winds, and at 2 p. m. northeast storm warnings were ordered from Jacksonville, Fla., to Fort Monroe, Va., it being apparent at that time that there was a disturbance some distance off the Georgia coast, possibly an offshoot from the general Caribbean depression. Fresh to strong northeast gales occurred along the Carolina coast, continuing until the morning of the 17th. Pressure was only slightly below normal, but at the same time it was quite high to the northward and northeastward. On the afternoon of the 14th the northeast warnings were continued from Charleston, S. C., to Fort Monroe, Va., and at 10 p. m. extended northward to Nantucket, Mass. While the winds were strong north of the Virginia capes, no severe gales were reported over that region. Warnings, however, were continued for a second period of 24 hours, as the disturbance persisted near the North Carolina coast. On the morning of the 17th the disturbance began to move northeastward, and northeast storm warnings were ordered from Block Island, R. I., to Boston, Mass. At 8 p. m. the disturbance was off Nantucket Lightship with a strong northeast gale in progress (64 miles an hour), and the northeast warnings were accordingly extended northward to Eastport, Me. The storm center turned more to the eastward during the night of the 17th-18th, and no strong winds occurred along the immediate Maine coast, although they must certainly have prevailed a short distance at sea. On the morning of the 19th the storm center was in the vicinity of Sable Island, where the barometer read 29.14 inches, and by the following morning it had passed beyond the field of observation, going some distance south of Newfoundland, St. Johns reporting a barometer reading of 29.54 inches in the evening of the 19th with light northeast winds.

The tropical storm of September 21-29, 1917.—On the morning of September 21 heavy southeast and south sea swells were reported from the Leeward Islands. Special observations indicated their continuance, and accordingly at 4 p. m. advices were issued to the effect that there was a disturbance a short distance north of the Virgin Islands moving northwestward. At 10 a. m. on the following day this information was repeated, but delayed reports received sometime later indicated that the disturbance was a short distance south of the Island of Santo Domingo, moving westward or west-northwestward and proper advices were immediately issued. However,

there were still indications that a more moderate disturbance had moved northwestward to the north of the Leeward Islands as indicated by a later fall in pressure in the Atlantic with accompanying northeast gales. During the 22d and the ensuing night the disturbance continued westward, and early in the morning of the 23d it passed with great intensity directly north of the Island of Jamaica, moving in a northwesterly direction. The observer at Kingston reported a barometer reading of 29.14 inches at 4:45 a. m., and press reports stated that great damage had been done over the northern portion of the Island. At noon of the 23d northeast storm warnings were ordered on the South Florida coast from West Palm Beach on the Atlantic side to Boca Grande on the Gulf side, and advices issued urging that every precaution against a dangerous storm should be taken. On the morning of the 24th the storm center was apparently in the vicinity of the Grand Cayman Island, and advices were issued accordingly. At 4 p. m. further advices stated that the storm was apparently nearing the Yucatan Channel or extreme western Cuba and extreme caution was urged for all vessels in the Gulf of Mexico. In the meantime pressure had fallen considerably over the Atlantic Ocean in the vicinity of latitude 30° N. and near the coast, probably the secondary depression noted several days previous north of the Virgin Islands. Over the North Atlantic marked high pressure prevailed, and northeast storm warnings were therefore ordered at 10:30 a. m. from Fort Monroe, Va., to Wilmington, N. C., with forecast of strong northeast winds or moderate gales. After the receipt of special reports in the afternoon northeast warnings were ordered at 7 p. m. on the New England coast from Block Island, R. I., to Provincetown, Mass. In both localities the strong winds occurred as forecast.

The tropical disturbance continued on its northwesterly course, and on the morning of the 26th all vessels in the Gulf of Mexico were again advised to exercise extreme caution. There were, of course, very few radio reports received from the vicinity of the storm, but approximate localities of the center from day to day were as follows: On the morning of the 25th a short distance south of extreme western Cuba, where the barometer at Isle of Pines read 29.42 inches with a northeast wind of 30 miles an hour; on the morning of the 26th near and a little west of latitude 25° N., longitude 85° W., the steamer *Gulfmaid*, then in that vicinity, reporting a strong southeast gale and a heavy sea; on the morning of the 27th about 150 miles south or south-southeast of the mouth of the Mississippi River, the steamer *Abarangez* in latitude 26° 30', N., longitude 87° W., reporting a barometer reading of 29.56 inches, with a southeast gale of 74 miles an hour; in the evening of the 27th, south of and probably about 75 miles from the mouth of the Mississippi River, the steamer *Abarangez* reporting a barometer reading of 29.62 inches with a southeast hurricane wind blowing 90 miles or more; on the morning of the 28th the storm center was close to the mouth of the river, the steamer *Suriname* anchored at Pilottown, La., reporting a barometer reading of 29.18 inches with a northeast hurricane wind. At 9 a. m. the *Suriname* reported a barometer of 29.06 inches with the wind backed to north and still blowing a hurricane. This was probably very close to the storm center, for by noon the wind at Pilottown, La., where the *Suriname* lay at anchor, shifted to northwest with a barometer reading of 29.24 inches and a wind velocity of 74 miles an hour. Barom-

eter, wind and weather reports from the *Suriname* were as follows:

Hour.	Barom-eter.	Wind.		Weather.
		Direction.	Velocity.	
<i>Sept. 27, 1917.</i>				
	<i>Inches.</i>		<i>Miles per hour.</i>	
8 a. m.	29.80	e.....	14	Partly cloudy.
2 p. m.	29.74	e.....	18	Rain.
4 p. m.	29.72	e.....	18	Do.
8 p. m.	29.66	e.....	40	Cloudy.
10 p. m.	29.66	e.....	40	Rain.
12 midnight	29.58	e.....	56	Do.
<i>Sept. 28.</i>				
2 a. m.	29.50	ne.....	90	Do.
4 a. m.	29.36	ne.....	90	Do.
8 a. m.	29.18	ne.....	90	Do.
9 a. m.	29.06	n.....	90	Do.
10 a. m.	29.08	n.....	90	Do.
12 noon	29.24	nw.....	74	Do.
2 p. m.	29.36	nw.....	64	Do.

Barograph traces for New Orleans, Mobile, and Pensacola are on file.

After 4 p. m. of the 28th no telegraphic reports were received from Mobile during the progress of the storm, and none from Pensacola after noon of the same date. A belated message from Mobile received shortly before midnight stated that the lowest barometer reading during the storm was 29.16 inches and the maximum wind velocity 98 miles an hour from the north. The message also stated that there had been no injurious tides (owing to the prevailing northerly winds); that there had been no deaths in Mobile; and that vessels had taken refuge up the river. The damage was limited mainly to roofs and frail structures.

The storm evidently recurved very close to and just east of the mouth of the Mississippi River, moved thence northeastward, passing to the southward of Mobile, and at 7 p. m. passed south of Pensacola, Fla., with a barometer reading of 28.51 inches, a maximum wind velocity for 5 minutes of 103 miles an hour from the southeast, and an extreme velocity of 125 miles an hour from the same direction. The damage was estimated to have been rather less than during the hurricane of October 18, 1916, when the lowest barometer was 28.76 inches and the maximum and extreme velocities 114 and 120 miles an hour, respectively. During the storm of September 28 the tide at Pensacola rose 4½ feet above the normal height.

The following details have been supplied by William F. Reed, jr., meteorologist and official in charge of the Pensacola, Fla., station:

The roar of the hurricane surf could be heard in Pensacola, which is 6 miles from the Gulf coast, by 12 midnight of the 26th, when the center of the storm was some hundred miles distant. The surf on the morning of the 27th increased to "very high" by 10 a. m., but subsided somewhat in the afternoon, when southerly winds by 6 p. m. became light and shifted to east.

On the morning of the 28th (Friday) the future course of the hurricane was uncertain: the surf had been very high all night; easterly winds were increasing and the barometer began falling. Flocks of small seagulls were observed flying inland between 6 a. m. and 7:30 a. m. seeking places of safety at the heads of the bayous. Upon inquiry I found that old residents considered this a sure sign of the immediate approach to our coast of a hurricane, and that these small gulls flew inland in large flocks just previous to the storm of September 26-27, 1906. On Friday morning shipping interests and commanding officers at the navy yard and forts and superintendents of railroads were phoned to take every precaution, since the premonitory signs indicated that the storm was close at hand.

The full force of the storm at Pensacola was felt near 4 p. m. on the afternoon of September 28. The lowest pressure (reduced to sealevel)

was 28.51 inches, at 6 p. m.: the highest wind velocity for a five-minute period was 103 miles from the southeast at 3.48 p. m. The table below shows the barometer readings, wind directions and velocities at short intervals during the 28th. The center of the hurricane evidently passed south of Pensacola, probably a distance of 50 miles.

The damage at Pensacola and vicinity was largely due to wind and wave action. A number of small craft, including the U. S. S. *Quincy*, were washed ashore or grounded and considerable damage was done to wharves, docks, and boat houses along the Gulf shore.

The damage by wind is estimated at..... \$100,000
 The damage by wave action and water at..... 50,000
 The damage to small craft..... 20,000

Total for Pensacola and vicinity..... 170,000

Heavy damage appears to have been sustained in Santa Rosa County, where much timber was blown down and crops, live stock, and buildings suffered from wind and rain.

TABLE 1.—Barometer readings (sealevel) and wind velocities for the five minutes ending with the times given at Pensacola, Fla., Sept. 28, 1917, Weather Bureau office.

[Wm. F. Reed, jr., and G. S. Kennedy, observers.]

Time.	Barometer.	Wind.		Tide above normal.
		Direction.	Velocity.	
<i>Sept. 28, 1917.</i>				
	<i>Inches.</i>		<i>Miles per hour</i>	<i>Feet.</i>
7:00 a. m.	29.73	ne.....	25	2.0
8:20 a. m.	29.69	e.....	36	2.5
10:00 a. m.	29.61	e.....	53	3.0
11:00 a. m.	29.56	e.....	56	.....
11:30 a. m.	29.50	e.....	60	.....
11:45 a. m.	29.46	e.....	67	.....
NOON	29.45	e.....	72	3.5
12:30 p. m.	29.43	e.....	80	.....
1:00 p. m.	29.38	e.....	80	.....
1:30 p. m.	29.31	e.....	76	.....
2:00 p. m.	29.21	e.....	84	.....
2:30 p. m.	29.13	e.....	82	.....
2:35 p. m.	.....	e.....	96	.....
2:45 p. m.	29.09	se.....	90	.....
3:00 p. m.	29.08	se.....	84	.....
3:15 p. m.	29.03	se.....	90	.....
3:30 p. m.	29.00	se.....	94	4.5
3:45 p. m.	28.93	se.....	96	.....
4:00 p. m.	28.90	se.....	96	.....
4:15 p. m.	28.86	se.....	96	.....
4:30 p. m.	28.81	se.....	96	.....
4:45 p. m.	28.75	se.....	96	.....
5:00 p. m.	28.71	se.....	96	.....
5:15 p. m.	28.62	e.....	94	.....
5:30 p. m.	28.54	e.....	96	.....
5:37 p. m.	.....	e.....	100	.....
5:45 p. m.	28.51	e.....	96	.....
6:00 p. m.	28.51	e.....	92	.....
6:15 p. m.	28.51	ne.....	78	.....
6:20 p. m.	.....	ne.....	88	.....
6:30 p. m.	28.52	ne.....	80	.....
6:45 p. m.	28.56	ne.....	84	.....
7:00 p. m.	28.62	n.....	78	.....
7:15 p. m.	28.65	n.....	92	.....
7:30 p. m.	28.80	nw.....	88	.....
7:45 p. m.	28.83	nw.....	88	.....
8:00 p. m.	28.90	nw.....	80	.....
8:15 p. m.	28.92	nw.....	92	.....
8:30 p. m.	28.99	nw.....	84	.....
8:45 p. m.	29.04	nw.....	84	.....
9:00 p. m.	29.09	nw.....	78	.....
9:15 p. m.	29.11	nw.....	80	2.5
9:30 p. m.	29.17	nw.....	84	.....
9:45 p. m.	29.19	nw.....	71	.....
10:00 p. m.	29.22	nw.....	76	.....
10:15 p. m.	29.24	nw.....	60	.....
10:30 p. m.	29.30	nw.....	70	.....

Press reports stated that five lives were lost at Crestview, Fla., an inland town about 40 miles northeast of Pensacola. No other loss of life was reported.

On the morning of the 29th the storm was central over southeastern Alabama with greatly decreased intensity (29.48 inches at Montgomery), but with sufficient rains to necessitate the issue of warnings of a moderate flood over the watershed of the lower Alabama River.

On the evening of the 29th the center was over southwestern Georgia with a still further decrease in intensity (29.64 inches at Thomasville), and by the morning of the 30th the remnants had passed off the Georgia coast,

the general low-pressure conditions along the South Atlantic coast having joined forces with another disturbance from the West that was central over Ontario. As pressure was rising rapidly in the rear of the general depression and falling over the North Atlantic Ocean, north-west storm warnings were ordered at noon September 30 from Delaware Breakwater, Del., to Nantucket, Mass. At 10 p. m. the warnings were extended to Eastport, Me. Moderate gales occurred along the New Jersey coast, but none to the eastward and northward, and at 10 a. m. October 1 the warnings were lowered.

The first display of warnings of the approaching storm was made at 5 p. m. September 25, when hurricane warnings were ordered on the Gulf coast from Apalachicola to Mobile, and all Gulf shipping was again warned to take every precaution necessary to insure safety. It was thought at that time that the storm would probably reach the Gulf coast some time during Wednesday night or Thursday morning, but subsequent developments proved that the movement of the storm center was slower than had been anticipated. Half an hour later southeast storm warnings were ordered on the Gulf coast of Florida from Key West to Tampa and northeast warnings from Rockwell to Carrabelle, and moderately strong winds occurred during the night along the south coast. At 5 p. m. of the 26th the hurricane warnings were continued from Apalachicola to Mobile, and at 10 p. m. extended westward to New Orleans, it appearing probable at that time that the storm center might possibly strike the Gulf coast a little farther west than had been first anticipated. At 11 a. m. of the 27th the hurricane warnings from Apalachicola to St. Andrews, Fla., were changed to southeast storm and inland storm warnings were given wide distribution over extreme northwestern Florida, southwestern Alabama, southern Mississippi, and southeastern Louisiana.

The hurricane warnings east of New Orleans were renewed on the morning of the 28th, and southeast storm warnings again ordered at St. Andrews and Apalachicola, it being apparent at the time that the recurving of the storm was in progress, although on the previous evening there had been no such evidence.

At noon, after the wind at Pilotown, La., had changed to northwest with rapidly rising pressure, the forecaster at New Orleans notified shipping at Texas ports that vessels bound for Atlantic and Caribbean ports could proceed with safety.

At 8 p. m. of the 28th, although reports were missing from the vicinity of the storm center, the surrounding pressure distribution indicated a sufficient gradient to warrant the extension of storm warnings (southwest) on the Gulf coast of Florida from Carrabelle to Rockwell, and on the Atlantic coast (southeast and northeast) from Jacksonville, Fla., to Fort Monroe, Va. However, as the decrease in the storm's intensity was very rapid only fresh winds occurred, except in the vicinity of Jacksonville, where a velocity of 44 miles an hour from the southeast was reported on the afternoon of September 29.

The storm passed too far south of Mobile to cause serious damage at that place.

**TROPICAL HURRICANE OF SEPTEMBER 27-28, 1917, IN
SOUTHEASTERN LOUISIANA.**

By RAY A. DYKE, Assistant Forecaster.

[Dated: Weather Bureau Office, New Orleans, La., Oct. 13, 1917.]

The tropical storm that occurred during the last week of September, 1917, was of more than ordinary extent and severity, as appeared when the western segment of the hurricane passed over extreme southeastern Louisiana on the 28th.

WARNINGS.

Ample notice of the presence of the storm was given in advisory messages, beginning on the 22d. On the 25th we were notified that hurricane warnings were hoisted from Apalachicola to Mobile and that all places on the coast from Mobile to New Orleans were advised to take all necessary precautions. These messages were radiographed to vessels at sea and all interests affected were kept fully advised.

Storm warnings were ordered for the Louisiana coast on September 26, as follows:

Hoist northeast storm warning 4:30 p. m., Burrwood, Empire, Pilot-town, and Morgan City, La., for shipping and fishing interests. Tropical disturbance in middle east Gulf will cause increasing northeast winds.

(Signed) DYKE.

The following message was received at 9:30 p. m. on the 26th:

Hoist hurricane warning 10 p. m., Pascagoula to New Orleans. Single radio report to-night from east-central Gulf indicates some possibility that the tropical storm may approach the coast a little farther west than appeared probable Tuesday, beginning some time Thursday morning. Impossible to locate center of disturbance and hurricane warnings therefore now displayed from New Orleans to Apalachicola.

(Signed) FRANKENFIELD.

This warning was immediately transmitted to our storm-warning displaymen, with instructions to distribute thoroughly; and was disseminated by motor boat throughout the Barataria Bay section and to Grand Isle. The city police and fire departments assisted in the distribution of the warning in New Orleans and the daily papers gave the warning prominence. All persons were advised to take precautions against dangerous winds and high tides.

The following warning received on the morning of the 27th, was given the fullest possible distribution:

Hoist hurricane warnings along central and eastern Louisiana coasts beyond New Orleans, also inland storm warnings for southeast Louisiana. Disturbance this morning apparently central about 150 miles southeast of the mouth of the Mississippi River, moving north-northwest.

(Signed) FRANKENFIELD.

This warning was sent to all telephone exchanges in southeastern Louisiana, and Superintendent T. B. Baird of the Cumberland Telephone & Telegraph Co. instructed managers to give the warning the widest possible distribution. Both the Western Union and the Postal Telegraph companies and the Louisville & Nashville Railroad Co. had the warning telegraphed to their offices along the middle Gulf coast, instructing their agents to notify persons in exposed places to seek secure locations, and to warn oyster and fishing interests to keep their fleets in off the Gulf. Complete distribution was effected at and in the vicinity of New Orleans.

A message from the supervising forecaster at 9 p. m. of the 27th stated that it appeared probable that the storm would reach the Louisiana coast Friday morning, the 28th. This prediction was in accord with the hurricane warnings and was given appropriate distribution.

The Weather Bureau office was open to the public during the night of the 27th-28th.

In order that precautions in southeastern Louisiana on the 28th might not be relaxed until danger from the storm was definitely past, the following warning was issued:

Advisory warning, Louisiana coast, 8:30 a. m.: Tropical disturbance central at mouth of Mississippi River, apparently short distance south-

east of Pilottown. Northerly gales, probably reaching hurricane force in southeastern Louisiana, with high tides to-day and to-night. Strong northwest winds on western Louisiana coast.

(Signed) DYKE.

In the distribution of this warning, particular attention was given to exposed places along and east of the Mississippi River.

The New Orleans Item, of September 28, 1917, comments as follows on the distribution of the warnings:

Whatever damage this gale may ultimately do, wherever it passes, will be largely unavoidable. Nobody in Louisiana or Mississippi is going to be caught unawares who can be reached by ordinary means of communication and by the extraordinary measures adopted by the Weather Bureau and by other public and private agencies to inform outlying places and persons.

The Weather Service has further commended itself to the people of the Gulf South in its ample warnings against the approaching disturbance. In view of the fact that Gulfport reports a gale of 50 miles * * * nobody along the eastern and middle Gulf coast will have the hardihood to find fault with hurricane warnings there because these warnings were not followed by the hurricane itself. * * *

Dr. Cline and his assistants have been the center of a disturbance all their own during the past few days, the locus of it being definitely established in the Federal building on Camp Street. Their department is rendering the country and its shipping great service in this as in similar visitations. Their service becomes more valuable as the department's facilities are extended in the Indies and the Caribbean.

METEOROLOGICAL CONDITIONS AND EFFECTS OF THE HURRICANE.

At New Orleans the pressure fell gradually during September 27, 29.77 inches being recorded at 7 p. m. The wind was northeast except for a few hours near noon, when it was east and southeast. The velocity increased from gentle to moderate. Lower clouds predominated, moving from the east and northeast; but 1/10 cirrostratus from the southwest, was observed in the early morning. The sky was overcast in the afternoon, and rain from 1:22 to 2:45 o'clock was attended by unusually dark clouds and a sharp fall in temperature.

The pressure was lowest between 3 a. m. and 3 p. m. on the 28th, varying slightly during this time, the minimum being 29.61 inches. The wind velocity did not exceed 30 miles an hour at New Orleans, notwithstanding that hurricane winds were blowing at the mouth of the Mississippi River from 2 a. m. to 9 a. m., and the barometer column descended to 28.91 inches at Port Eads, at 6:30 a. m. The wind direction at New Orleans changed from northeast to north at midday and to northwest at 3 p. m. and the velocity diminished in the afternoon.

The river, which was low, rose from 5.2 feet, on the 26th, to 6.6 feet, on the 28th, after which it fell to 4.1 feet, on the 30th. The tide at Grand Isle and Port Eads was 4 feet above normal.

In order to show the conditions when the center of the disturbance was nearest the Louisiana coast, reports from the Mississippi River passes have been combined with the daily weather map. That the path of the center was close to Port Eads is made apparent by the accompanying figure 1 showing barometric pressure and wind directions in Louisiana at 7 a. m., September 28. Figure 2 shows the location of places on the lower river.

East winds were observed at the mouth of the river until about 3 a. m., after which there was a gradual change to northeast. During the height of the storm the directions were northeast and north-northeast. In the early afternoon the wind became northwest.

At Port Eads the anemometer of the United States Engineers' office registered until 7:10 a. m. of the 28th, when the exposed part blew away, just after recording 84 miles an hour. Mr. O. O. Melancon, junior engineer,

on duty at Port Eads at the time, estimates that between 7 a. m. and 9 a. m. the velocity reached 90 to 100 miles an hour. The highest velocities at the special Weather Bureau station at Burrwood were recorded between 5 a. m. and 9 a. m., the maximum velocity for a 5-minute period being 80 miles an hour at 5:40-5:45 a. m. A velocity of 79 miles an hour was recorded at 8:10-8:15 a. m.

It is probable that hurricane winds did not occur much farther up the river than Fort St. Philip, although there was considerable damage to the rice, sugar, and orange crops farther north in Plaquemines Parish. The greatest damage to crops was on the eastern side of the river. The western side escaped with small loss. This hurricane was like its predecessors, in that, when it reached the land, the wind velocities near the rim of the

lodges of some hunting clubs suffered considerable damage. The western bank of the river was littered in places with the fragments of broken houses, and the bodies of dead animals, including cattle, horses, dogs, goats, and hogs, were seen along the lower river soon after the storm.

The early and thorough distribution of the warnings caused all kinds of craft to be placed in safe waters, and damage to shipping was exceedingly slight, other than that of the small boats already referred to. The bayous and canals provided a good refuge for boats.

In places subject to danger from high water along the Mississippi River and near Lakes Borgne and Pontchartrain people moved out, and there is no doubt that many lives were thus saved by the warnings. So far as

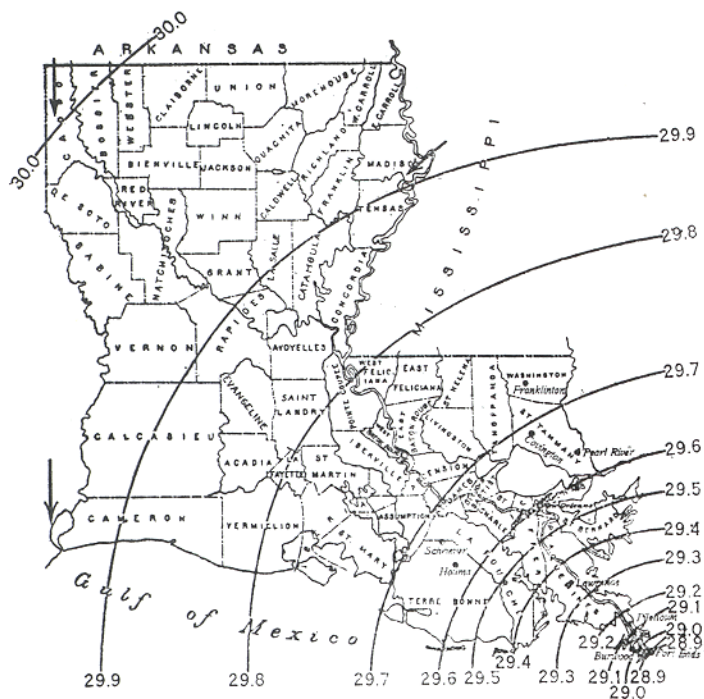


FIG. 1.—Map of Louisiana, showing isobars and a few wind directions at 7 a. m. September 28, 1917.

western segment were much less than the barometric gradient would indicate.

The precipitation was excessive only in the vicinity of the Passes and did not extend far inland. The fall at Burrwood on the 27th-28th was 6.40 inches.

Maj. Frank M. Kerr, of the Louisiana State Board of Engineers, reports that 3 miles of levees on the east bank south of Nicholls and 2½ miles between Boothville and Venice, on the west side, will require new earthwork and wood revetment as a result of the storm. The levees that were damaged on the eastern bank were struck by the Gulf waters from Breton Sound.

Below Buras numerous buildings were dislodged from their foundations, and several houses and barns were blown down. One building of considerable size was carried by wind and water through the levee and was left on the river bank. Fishermen along the lower river lost some of their small boats, but most of the boats were stranded and can be refloated. Fishing camps and the

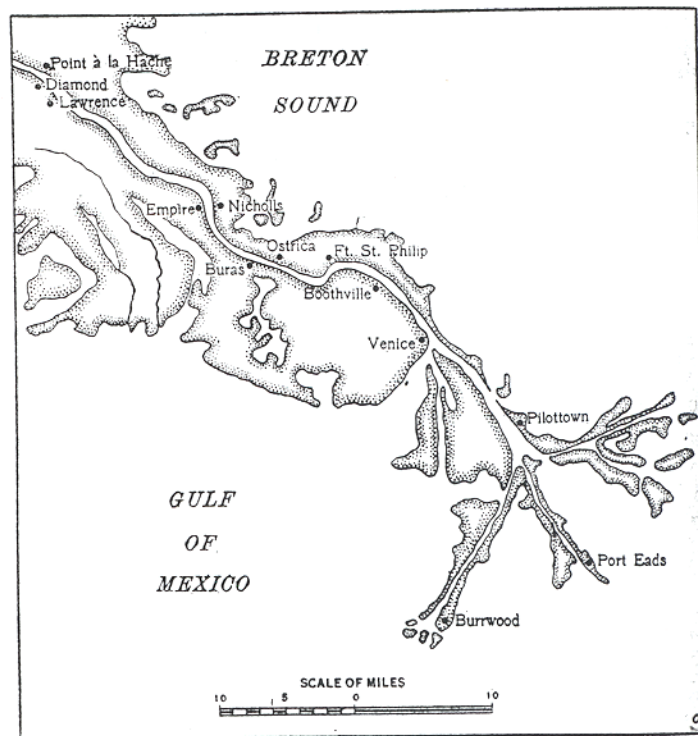


FIG. 2.—Detail diagram showing relative locations of points on the lower stretch of the Mississippi.

can be learned the only loss of life was that of an 8-year old boy named James Ohenio, who, while walking along Bayou St. John, near New Orleans, was caught by a gust of wind, lost his footing, fell into the water, and died soon after being pulled out. This incident might have occurred with any strong wind.

Train service to Mobile was interrupted on the 28th and part of the 29th because of the washing out of the ballast under the Louisville & Nashville track near Lake Catherine, about 30 miles northeast of New Orleans. The movement of vessels toward east Gulf and Caribbean ports had ceased on the 24th. Sailings of vessels from New Orleans in all directions were cancelled on the 26th and 27th.

Early in the afternoon of the 28th we were able to announce that the storm had passed on the eastern side and that all danger in New Orleans was definitely over. Shipping was soon afterwards advised that it was safe to proceed.