TROPICAL CYCLONES DURING 1925

By W. P. DAY

Only three tropical disturbances which might be classed as hurricanes were observed in the Caribbean Sea, the Gulf of Mexico, and the adjacent waters of the Atlantic. At the same time four important storms were experienced on the Pacific south of Mexico, and several other individual reports of gales were received from vessels in that region and south of Central America.

On the 3d of June a tropical disturbance was experienced in the Pacific south of the Gulf of Tehuantepec. It moved slowly northwestward during the next three days, striking the Mexican coast west of Salina Cruz on the 7th. It was apparently only of moderate intensity.

At 2 a. m. on July 10, the S. S. *San Tiburcio* in the Pacific near latitude 15° N. and longitude 112° W. encountered a severe hurricane, the barometer reading as low as 28.90 inches.

The S. S. *Antinous* at 2.30 a. m. of August 20 in latitude 34° 38′ N. and 63° 05′ W. passed near the center of a small hurricane. The lowest reading of the barometer was 29.34 inches and the highest wind was force 12 (Beaufort). This storm began to form in the remnants of a low-pressure trough on the 18th, about half-way between Bermuda and the Florida Peninsula, moved thence slowly northeastward and apparently reached its greatest intensity while in the vicinity of the S. S. *Antinous*. It merged with a more extensive disturbance to the north, but could still be identified on the morning of the 21st near latitude 41° N. and longitude 52° W.

On the 5th of September the S. S. *Baja California* in the southwestern Gulf of Mexico experienced a storm with winds shifting from north through east to southeast. The storm moved rapidly northwest to the mouth of the Rio Grande by the evening of the 6th, and caused heavy rains and moderate gales over the lower Rio Grande valley. Again, from the 12th to the 16th of September a tropical disturbance of considerable intensity moved west-northwest along the southern Mexican coast, causing gales from the Gulf of Tehuantepec to Cape Corrientes.

During October the only important tropical disturbance was a hurricane apparently of considerable intensity, which developed off the southern Mexican coast about the 22d and passed inland near Cape Correintes on the 25th.

The only important hurricane affecting the United States took form in the northwestern Caribbean Sea on November 29, crossed the Florida Peninsula and extreme eastern North Carolina, turned eastward across the Atlantic and was last noted on the 9th of December after passing the Azores. The lowest barometer reading reported in this storm was 28.90 inches, by the U.S.S. *Patoka*, near the North Carolina coast on the 2d of December. A complete account of this hurricane will be found under the heading, "Storms and Weather Warnings," in this issue of the REVIEW. The appearance of a true hurricane so late in the season is of particular interest.

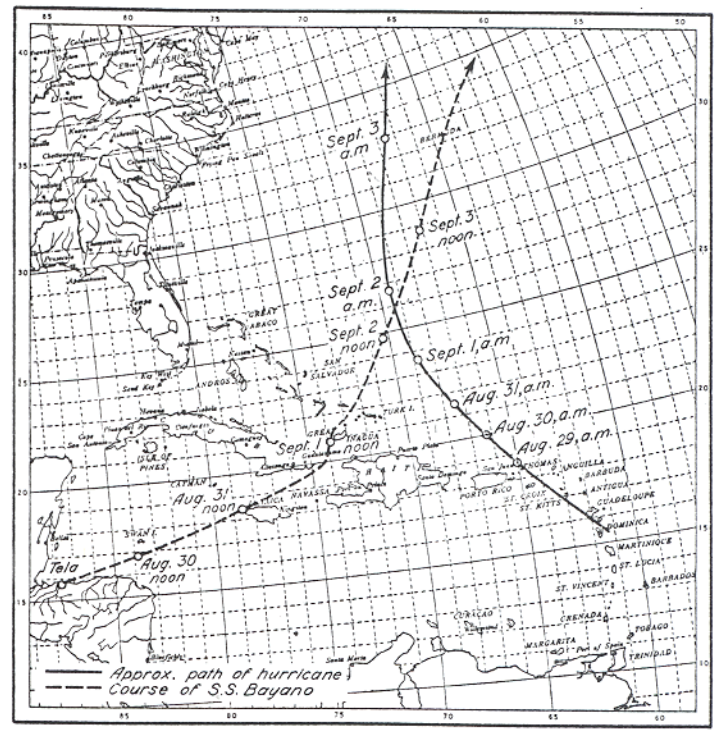
REPORT OF CAPT. F. H. SWAIN ON THE WEST INDIAN HURRICANE OF AUGUST 28–SEPTEMBER 6, 1924

In connection with the West Indian hurricane which prevailed from August 28 to September 6, 1924, Capt. F. H. Swain, master of the British Steamship *Bayano* and a valued observer for the Weather Bureau, rendered a very complete report of weather conditions as observed on board his vessel during the progress of the storm.

The hurricane was first reported in the vicinity of the island of Dominica during the day of the 28th, and in the early morning of the 29th the center passed near the island of St. Thomas, moving slowly in a northwesterly direction. Its intensity was such that severe losses were sustained on several of the smaller islands of the Lesser Antilles.

The *Bayano* was due to sail from Tela (Spanish Honduras) on August 29 for Avonmouth via Bermuda. Captain Swain, receiving radio telegraphic advices regarding the hurricane, doubtless realized that his course might bring him into close proximity to the center unless changed through the exercise of good judgment and seamanship. Fortunately, it happened that the hurricane, although moving but slowly, recurved and passed ahead of the *Bayano* at some distance, so that it was not necessary to maneuver the vessel to avoid the center.

During the days when the course of events was yet uncertain Captain Swain, assisted by his officers, made and recorded a series of weather observations that might well serve as a model for other seamen finding themselves in a similar situation. The Weather Bureau is very glad to publish herewith the major part of this series of observations. A small map is appended on which are shown the respective positions of vessel and storm center on successive days.



DAILY JOURNAL.

NOTE.—From August 28 to September 4 received storm warnings from Washington and various sources.

August 30:

2:15 a. m. Very heavy rain with thunder and lightning until 2:35 a. m., when rain ceased and wind veered to E. by N. and quickly increased to force 9 to 10; first in fierce gusts, then steadily.
3:20 a. m. Wind veering slowly and gradually decreasing.
6 a. m. Continuous light rain. Sky clear to N. and NW.
8 a. m. Extreme visibility over land.
8 p. m. Small Nb. clouds at low altitudes.
Midnight. Wind inclined to back; clouds around horizon.

August 31:

2 a. m. Stars very brilliant; occasional small detached Cu. from ESE.
6 a. m. Very clear; Small detached Nb. from ENE.
4 p. m. Cu.-St. in SW. quadrant.
6 p. m. Cu.-Nb. around horizon.
8 p. m. Streaks of Ci.-St. over sun at sunset.
10 p. m. Squalls of rain working from eastern quadrants.
Midnight. Thin St. around horizon.

September 1:

NOTE.—From 8 p. m. 31st to 5 a. m. September 1 stars showing very brilliant, appearing enlarged with halos around them or as having blurred appearance. Cuban land extraordinarily clear; visible at long distances, although appearing close at hand. Stars reflected in water. Weather appeared hazy, yet land and stars showed through brilliantly.
Heavy clouds over Cuban mountains at sunrise; small detached Ci.-St. to eastward.
8 a. m. Wind increasing and backing to N. by E. when clearing the land.
2 p. m. Cumulus (low) all parts of horizon.
3:30 p. m. Wind dog to NE.; swell rising; Cu.-Nb. to W. and SE.
6 p. m. Ci.-St. and Cu.-Nb. from NE.; swell increasing.
Sunset. Small streaks of St. over sun; occasional light showers.
10 p. m. Cu.-Nb over southern horizon.
Midnight. Wind backing.
2 a. m. Lightning to NE.

September 2:
4 a. m. Thin St. in NE. quadrant; small detached Cu. from NNW.
6 a. m. Thin St. overhead; heavy Nb. to NW.
8 a. m. Thin St. overhead; Nb. to N. and NW.; confused swell.
10 a. m. Thin Ci.-St. in zenith; Cu. and Nb. working from N. quadrant.
Noon. Sky overcast around horizon; heavy confused sea and swell.
2 p. m. Sky covered with St.; Cu.-Nb. to SE.
4 p. m. Sun visible through St.; Nb. to N.
6 p. m. Ci.-St. overhead; detached Cu. around horizon.
Sunset. Sky around sun pale yellow; Ci. above; pink sky to NE. and greenish appearance to E.; wind moderating after sunset.

September 2—Continued.
10 p. m. Cu. and St. banking around horizon SW. quadrant.
Midnight. Detached Cu. from SW. quadrant.
September 3:
2 a. m. Occasional Cu.-Nb. from SW.
3:30 a. m. Light showers.
6 a. m. Nb. around horizon from NE. to S. through SE.
8 a. m. Ci. passing from SW. to NE. Nb. around horizon.
Noon. Heavy Cu. and Nb. to N. and W., with rain showers.
2 p. m. Massive Cu. to SE.
4 p. m. Cu. in S. and SE. quadrant (horizon only).
6 p. m. Thin St. over sun; Cu. to westward.
Sunset. Thin St. above sun; small detached Cu. around horizon.
September 4:
Very good visibility from midnight 3d to daylight 4th off Bermuda.

Observations made on board S. S. "Bayano" in the West Indies during the hurricane of August 28–September 6, 1924

Date (1924)	Local mean time	Latitude N.	Longitude W.	Wind		Barometer (corrected)	Temperature			Weather	Clouds			Sea	Swell
				Direction	Force		Air	Wet bulb	Water		Form	Direction (from)	Amount		
							°	°							
Aug. 29	Midnight			NE	3	29.94	82	78	84	bcvl	Cu., St		5	NE., 2-3	NE., 2.
Aug. 30	2 a. m.														
Do	4 a. m.			E. by S	5-6	29.92	76	75	82	o	Cu., St		10	E'ly, 4	NE., 2.
Do	6 a. m.			SE. by E	5-4	29.91	78	74		od	Cu.-Nb		9	SE. by E., 4	ENE., 2.
Do	8 a. m.			SE. by E	4	29.92	80	76	83	ov	St		9	SE. by E., 3	ENE., 2.
Do	10 a. m.														
Do	Noon	16° 53′	83° 50′	SE. by E	3	29.96	86	80	83	ov	Cu., St		9	SE. by E., 3	ENE., 2.
Do	2 p. m.			E. by S	2	29.94	86	80		ov	Ci., Ci.-St., A.-Cu., Cu.		8	E. by S., 2	ENE., 2.
Do	4 p. m.			E	2	29.93	87	80	85	ov	Ci., Ci.-St., A.-Cu., Cu.	Easterly	10	E., 2	ENE., 2.
Do	6 p. m.			E	2	29.94	85	80		o	Ci., Ci.-St., Cu.-St., Cu.		9	E., 2	ENE., 2.
Do	8 p. m.			E	2	29.96	83	79	84	bv	Cu., Cu.-Nb		1	E., 2	ENE., 2.
Do	10 p. m.			E. by N	2	29.97	83	79		bv	Ci., Cu		1	E., 2	ENE., 2.
Do	Midnight			E. by N	2	29.97	83	79	84	bv	Ci., Cu., St	ESE	1	E., 2	ENE., 2.
Aug. 31	2 a. m.			E	2	29.93	82	78		bv				E., 2	ENE., 2.
Do	4 a. m.			E	2	29.93	82	78	83	bv				E., 2	ENE., 2.
Do	6 a. m.			E	2	29.93	83	78		bv	Cu.-Nb	ENE	1	E., 2	ENE., 2.
Do	8 a. m.			E	3	29.96	85	79	84	bv	Cu.-Nb		1	E., 2	ENE., 2.
Do	10 a. m.			ENE	4	29.98	86	80		bv	Cu		2	E. by N., 2	ENE., 2.
Do	Noon	18° 29′	78° 31′	ENE	4	29.97	87	80	84	bv	Cu		2	E. by N., 3	ENE., 3.
Do	2 p. m.			ENE	4	29.95	87	80		bcv	Ci.-St., Cu.-St		3	ENE., 3	ENE., 2.
Do	4 p. m.			ENE	4	29.93	85	80	84	bv	Ci., Cu.-St		2	ENE., 3	ENE., 2.
Do	6 p. m.			ENE	4	29.92	83.5	78		bv	Cio.-St., Cu.-Nb		2	ENE., 3	ENE., 2.
Do	8 p. m.			ENE	3	29.92	83	78	83	bv	Cu., Cu.-Nb		2	ENE., 2	ENE., 2.
Do	10 p. m.			ENE	2	29.94	83.5	79		bv	Cu., Cu.-Nb	E	5	ENE., 1	ENE., 2.
Do	Midnight			NE. by N	2	29.95	82	78	84	bv	Cu., Cu.-Nb		2	NE., 1	ENE., 2.
Sept. 1	2 a. m.			NE	2	29.92	82	77		bv			0	NE., 2	NE., 2.
Do	4 a. m.			NE. by N	2	29.90	80	77	82	bv			0	NE., 2	NE., 2.
Do	6 a. m.			NE. by N	2	29.90	80	77		bv	Ci.-St., Nb		1	NE., 2	NE., 2.
Do	8 a. m.			N. by E	3	29.92	82	78	83	bc	Cu.-Nb		1	N. by E., 2-3	NE., 2.
Do	10 a. m.			N. by E	2-3	29.93	89	80		b	Cu.-St		1	N. by E., 3-2	NE., 1.
Do	Noon	20° 56′	73° 48′	N. by E	3	29.93	86	79	83	b	Ci.-Cu		1	N. by E., 2-3	NNE., 2.
Do	2 p. m.			N. by E	3	29.92	86	79		bc	Cu., Ci.-St		1	N. by E., 2-3	NE. by N., 3.
Do	4 p. m.			NNE	3-4	29.90	85	79	84	bc	Cu., A.-St	NE	3	NNE., 3	NE. by N., 4.
Do	6 p. m.			N	4	29.87	83.5	78		bc	Ci., Ci.-St., Cu.-Nb.	NE	1	N., 3	NE., 5.
Do	8 p. m.			N	4	29.87	82	78	82	b	Cu.-Nb		1	N., 3	NE., 5.
Do	10 p. m.			N	4	29.87	82	77		b	Cu.-Nb		1	N., 3	NNE., 5.
Do	Midnight			N. by W	3	29.84	81	77	82	b			0	N. by W., 2-3	NNE., 5.
Sept. 2	2 a. m.			NNW	3	29.84	80	77		bl	Cu.-St		1	N. by W., 3	NE. by N., 5.
Do	4 a. m.			NW. by N	3	29.83	81	77	82	b	Cu.-St	NNW	1	NNW., 2	NE. by N., 5-6
Do	6 a. m.			NW. by W	4	29.83	81	77		c	St., Cu.-Nb		5	NW., 3	ENE., NW., 5.
Do	8 a. m.			WNW	5	29.80	82	78	81	c	Ci.-St		5	NNW., 4	ENE., 5-6.
Do	10 a. m.			WNW	5-6	29.80	82	78		c	Cu.-St	N	6	WNW., 4-5	NW., 5-6.
Do	Noon	24° 47′	70° 21′	WNW	6	29.81	84	79	81	oc	Cu., Cu.-St		7	WNW., 5	ENE., NW., 6.
Do	2 p. m.			W	6	29.80	84	79		oc	Ci., Ci.-St., Cu., Cu.-St.		10	W. by N., 5	NE., NW., 6.
Do	4 p. m.			WSW	6	29.80	83	79	80	oc	Ci.-St., Cu		9	WSW., 5	NE., WNW., 6
Do	6 p. m.			SW. by W	6	29.80	81	78		bc	Ci.-St., Cu		4	SW. by W., 5	E., confused, 6.
Do	8 p. m.			SW. by W	6-5	29.82	80	77	80	b	Cu		1	SW. by W., 5	E., confused, 6.
Do	10 p. m.			SW	5-6	29.82	80	77		b	Cu.-St		1	SW., 5	E., confused, 6.
Do	Midnight			SW	5-6	29.82	80	77	80	b	Cu		1	SW., 4-5	E., confused, 6.
Sept. 3	2 a. m.			SW	6-7	29.84	80	77		b	Cu., Cu.-Nb		1	SW., 5	E., confused, 6.
Do	4 a. m.			SW	6-7	29.84	79	77	79	b	Cu., Cu.-Nb		1	SW., 4-5	ESE., confused
Do	6 a. m.			SW	6-7	29.88	79	76		b	Ci., Nb		2	SW., 5-6	W., ESE., 6-5.
Do	8 a. m.			SW	6-7	29.90	80	76	82	b	Ci., Nb		2	SW., 6	W., ESE., 6-5.
Do	10 a. m.			SW	6-7	29.93	83	77.5		b	Ci., Cu		1	SW., 6	W., ESE., 6-5.
Do	Noon	28° 48′	67° 08′	SW	6	29.94	84	79	79	bc	Cu.-Nb		6	SW., 6	W., ESE., 6-5.
Do	2 p. m.			SW	5	29.94	85	80		bc	Cu		3	SW., 5	WSW., ESE.,
Do	4 p. m.			SW	5	29.94	84	78	81	b	Ci., Ci.-Cu., Cu		2	SW., 5	W., SE., 5
Do	6 p. m.			SW	5-4	29.95	82.5	78		b	Cu.-St		1	SW., 5	S., ESE., W.,
Do	8 p. m.			SW	5	29.97	80	77	80	bv	Cu		1	SW., 5-4	W., S., ESE.,
Do	10 p. m.			NW	2	29.99	80	76.5		bv	St		1	SW., 4	W., S., ESE.,
Do	Midnight			NW	2	29.99	79	76	79	bv	St		1	SW., 4	W., ESE., 5.
Sept. 4	2 a. m.			NW	2	30.00	78	75		bv		NNW		NW., 3	W., SE., 5.
Do	4 a. m.			NW	2	30.01	78	75	78	bv				NW., 2	W., SE., 5.

NEW ORLEANS FORECAST DISTRICT

A disturbance of moderate intensity appeared in the west Gulf off the mouth of the Rio Grande during the evening of the 6th, and northeast storm warnings were ordered displayed at 9 p. m. from Corpus Christi to Brownsville, and on the morning of the 7th were extended over the remainder of the Texas coast. The disturbance moved northward with diminishing intensity and storm winds occurred only on the western portion of the Texas coast. Small-craft warnings were displayed at Corpus Christi on the 17th, 24th, and 29th. No storm occurred without warning.—*I. M. Cline.*

RIVERS AND FLOODS

By H. C. FRANKENFIELD

The rise in the lower Rio Grande in early August, on which report was deferred until this issue of the REVIEW, passed flood stage at only one Weather Bureau gaging station—San Benito, Tex. No reports of damage have been received.

Virtually coincident with the above, however, another rise of more importance was in progress in the vicinity of and below El Paso, Tex. Definite reports are similarly lacking for this flood, though revised estimates by newspapers place losses resulting from it at $275,000—chiefly in crops and levee damage. The progress of the crest, which gradually diminished, was evident in moderate rises downstream later in August, but flood stage was not reached at any Weather Bureau station.

A third and much more serious rise occurred in the vicinity of El Paso early in September. Of this flood Mr. Robert M. Shaver, official in charge of the Weather Bureau office at El Paso, reports as follows:

> The occurrence of heavy rains over the upper portion of the Rio Grande watershed between El Paso and the Elephant Butte Dam, which is 122 miles northwest of El Paso, on August 31 and September 1, 1925, caused a rapid rise in the river.
>
> Limited overflows occurred at a few points in the valley northwest of El Paso on September 1 and 2; and serious overflows at several places from 6 miles northwest to 40 miles southeast of El Paso during September 2, 3, 4, and 5.
>
> Engineers estimated that 11,500 acres of land were flooded on the American side of the river, and 5,000 acres on the Mexican side; and that 75 per cent of this land was under cultivation. Between 300 and 400 houses, built of adobe, a majority of which were in El Paso and its immediate vicinity, were ruined or seriously damaged when their walls were crumbled by coming in contact with the water. A greater number of houses suffered lesser injuries. The most conservative estimates placed the total loss occasioned by the flood at $1,000,000.
>
> The United States Reclamation Service, with project headquarters at El Paso and substations and river gages at certain points along the river, was able to follow the stages of the rise and issue adequate warnings.
>
> There would have been far greater destruction had not dikes been prepared hastily at the weaker points along the river bank. This work was directed largely by the local officials of the United States Reclamation Service and the city engineer. The farmers and their helpers were assisted greatly in the construction of the dikes by soldiers and materials from Fort Bliss.
>
> Since the completion of the Elephant Butte Dam in 1916, there has been a gradual rise in the bed of the river, due to the decrease in the rate of movement of the river. There is also a large horseshoe bend in the river just below El Paso which also retards the movement. The increase in elevation of the river bed at the Santa Fe Street Bridge at El Paso is now 9 feet. This induces a dangerous condition, as comparatively small rises in the river will produce overflows.

Heavy rains in the lower portion of the watershed again raised the river to above flood stage at Rio Grande City and San Benito on the 8th and 9th. Of the results of this rise, Mr. J. H. Jarboe, official in charge of the Weather Bureau office at San Antonio, Tex., reports in part as follows:

> Levees, weakened by continuous rains during the month, gave way in several places and large sections of farm lands were flooded. Most crops had been harvested and the losses were mostly in delayed farm work, delayed business and transportation, and about $40,000 spent in holding and repairing levees, mostly in Cameron County.

A destructive local flood, caused by heavy rainfall over the precipitous and narrow Squillchuck Canyon and resulting in the loss of 14 lives and property damage estimated at $130,500, occurred near Wenatchee, Wash., during the afternoon of September 5. Since no rain gages are maintained in the area over which the heaviest rain fell, no data are available as to its amount; but the topography of the canyon is such that even a moderately heavy fall, if sudden enough, could readily have caused a flood of this extremely destructive type. The losses were apportioned as follows:

Railroad property	$75,000
Highways	3,500
Irrigation canals and ditches	4,000
Fruit trees washed out	3,000
Buildings, automobiles, and other property	45,000
Total	130,500

The high stages occurring in the Gila and Hassayampa Rivers of Arizona were without consequence; and no report of damage has been received of the moderate flood in the Grand River of Missouri on the 13th and 14th.

STORMS AND WEATHER WARNINGS

WASHINGTON FORECAST DISTRICT

On the morning of the 3d, northwest storm warnings were ordered from Atlantic City to Boston and warning was given in radio bulletins that winds would be strong, reaching gale force at times, off the Middle and North Atlantic coast. Strong winds occurred along the coast and severe gales off the coast between Bermuda and Nantucket.

Storm warnings were ordered on the evening of the 5th from Atlantic City to Eastport in anticipation of the disturbance over Hudson Bay increasing in intensity, but winds did not reach dangerous proportions and warnings were accordingly taken down the following morning.

Warnings were hoisted on the evening of the 7th from Atlantic City to Eastport in connection with a disturbance over Ohio, and strong winds and gales occurred over the region indicated.

On the morning of the 12th, warnings of strong shifting winds were disseminated from Jacksonville to Sandy Hook and at 4 p. m. warnings of strong winds and gales were extended northward to Eastport. Warnings were ordered down south of Hatteras the night of the 12th, and warnings were continued north of Delaware Breakwater to Eastport on the 13th and 14th. Winds occurred substantially as indicated in the advices.

Warnings were ordered on the morning of the 15th from Wilmington to Boston in connection with a disturbance over the Lower Lakes and on the evening of that day were extended northward to Eastport. On the following day warnings were changed to northwest from Delaware Breakwater to Eastport, and on the 17th were continued from New London, Conn., to Eastport. Strong winds and gales occurred as forecast.

On the 21st storm warnings were hoisted from Hatteras to Eastport, but winds were only fresh to strong and did not reach gale velocities.

In connection with a disturbance over western Pennsylvania, warnings for strong, shifting winds were ordered on the 27th from Sandy Hook to Eastport and strong winds occurred substantially as indicated.

At 3 p. m. on the 30th, storm warnings were issued from Punta Gorda to Jacksonville, Fla., in connection with a disturbance of tropical origin central slightly west or northwest of the Tortugas. The disturbance moved northeastward with increased intensity across the Florida Peninsula, passing near and south of Tampa. It was attended by heavy rains, especially in the right front quadrant, a fall of 14.08 inches occurring at Miami, Fla. A discussion of the subsequent movement and warnings issued in connection with this disturbance will be found in the next issue of the MONTHLY WEATHER REVIEW.

On the 23d, norther warnings were sent to the chief hydrographer, Canal Zone, and fresh to strong north and northwest winds were indicated for the Caribbean. In his letter the chief hydrographer indicates that the wind occurred as stated in the advices.

In this connection the pilot-balloon run of November 24 at Kingston, Jamaica, is so interesting that it is given here: Surface—N—10 m p s; 250m—N—16 m p s; 500m—N—6 m p s; 750m—ESE—1 m p s; 1,000m—E—4 m p s; 1,500m—SE—2 m p s. It will be noted that the northerly current extended up to 500 meters.

Frost and freezing temperature warnings were issued for portions of the east Gulf and south Atlantic States, on the 8th, 9th, 15th, 17th, 20th, 21st, 22d, 23d, and 28th.—*R. H. Weightman.*

STORMS AND WEATHER WARNINGS

WASHINGTON FORECAST DISTRICT

The tropical cyclone that passed over the Florida Peninsula during the night of November 30–December 1 originated over the northwestern Caribbean Sea and was central a short distance east or southeast of Swan Island at 8 a. m., November 29. It was of slight intensity at this time, but increased rapidly in intensity after passing through the Yucatan Channel during the following night, and by 8 p. m. of the 30th the barometer at Key West, Fla., had fallen to 29.62 inches and the wind had shifted to southwest. The S. S. *El Isleo*, which was some distance northwest of Key West in latitude 25° 18′ N. and longitude 84° 0′ W., reported a barometer reading of 29.60 inches and wind force 10 (whole gale) from the northwest.

During the night of November 30 the center of the storm passed inland south of Tampa. At Tampa the barometer fell to 29.50 inches and the wind reached a maximum velocity of 52 miles from the northeast about 1 a. m. of December 1. At 8 a. m. of December 1 the storm was centered a short distance east of Titusville, and the pressure at the center was somewhat under 29.50 inches. Jacksonville reported a maximum wind velocity of 48 miles from the north. Vessel reports from near the center at noon showed that the storm had attained hurricane intensity. The S. S. *R. W. Stewart* in latitude 29° 40′ N., and longitude 79° 10′ W., reported a barometer reading of 29.30 inches, with a whole gale blowing from the northeast, accompanied by mountainous seas. The S. S. *El Estero*, less than 100 miles to the south-southwest, reported a barometer reading of 29.34 inches and a wind force of 12 (hurricane) from the west. No 8 p. m. vessel reports were received from the vicinity of the hurricane center, which was apparently about 150 miles due east of Savannah, Ga., at that time. The wind had increased to 42 miles an hour at both Savannah and Charleston, but it was only 24 miles an hour at Hatteras. Northeast storm warnings had been ordered displayed from Punta Gorda to Jacksonville, Fla., during the afternoon of November 30 and north of Jacksonville to Boston, Mass., at 9:30 a. m. of December 1. It was stated in the hoist messages of the 1st that the storm would increase in intensity and likely become severe. At 9:30 p. m. of the 1st, whole-gale warnings were ordered displayed from Beaufort, N. C., to the Virginia Capes, and northeast storm warnings were extended north of Boston to Eastport, Me.

At 8 a. m. of the 2d the hurricane was central about 100 miles south-southeast of Wilmington, N. C., the U. S. S. *Patoka* reporting a barometer reading of 28.90 inches with wind force 9 (strong gale) from the east. The storm center passed inland between Wilmington and Cape Hatteras at about 6 p. m., and out to sea again a short distance south of Cape Henry during the night. The northeastward progress of the storm was slowed up and it was deflected toward the east by a strong area of high pressure that had remained almost stationary for several days over the Canadian Maritime Provinces. The storm apparently lost considerable of its intensity as it moved slowly eastward, its center crossing the meridian of Bermuda, but several hundred miles to the north of that island, during the afternoon or night of the 4th.

The subsequent movement of this storm eastward over the ocean was shown by the receipt of wireless reports from the S. S. *American Legion* the morning of the 5th and from the S. S. *Polybius* the evening of the same day. These observations were valuable for the purpose of tracing the movement of this storm, especially as these vessels were in a part of the ocean from which wireless reports are seldom received. Falling pressure and increasing northeast winds at Horta, Azores, during the night of December 7–8 indicated the approach of the storm, and its center passed close to Horta at 4 a. m. of the 9th, with a barometer reading of 29.32 inches and a maximum wind velocity of 40 miles an hour from the northeast. After passing to the northeast of the Azores, this storm apparently merged with another disturbance of wide extent over the North Atlantic.

A very complete report on the damage caused by this storm as it passed over the Florida Peninsula has been prepared by the section director at Jacksonville. The following are extracts from this report:

> As a result of the southwest-northeast movement of the storm over the peninsula most of the section east of the Suwannee River felt its force to some extent, chiefly, however, over the peninsula, where trees were uprooted and telephone and telegraph wires were prostrated. Fruit was blown from the trees and much was "thorned"; lowlands were flooded; and, incidentally, much truck was lost. Structures in process of completion suffered considerably; dredges were sunk and many small boats were damaged or sunk at anchor. As a result of the phenomenally high tides and seas damage to beaches and beach property from the mouth of the St. Johns southward was very great—only in millions can the computation be made. In some cases the inroads of the sea exceeded 100 feet. Pavilions, small cottages, and even pretentious structures were undermined, and hotels, whose safety hitherto had never been questioned, were in imminent danger. The extent of the damage from this source is indicated by the fact that $1,000,000 will be required to replace the Jacksonville beaches as they were formerly. There have been higher winds on the coast, and the explanation of the great damage to the Atlantic beaches and beach property is found in the persistence of, and the relatively high, northeast winds, which began at Jacksonville about noon of the 28th and continued until 1 a. m., December 1. The maximum velocity at Jacksonville was 52 miles an hour, setting in with 25 miles on the 28th, 38 miles on the 29th, 34 miles on the 30th, and 52 miles on December 1. The velocities were considerably higher on the coast, from which Jacksonville is distant 17 miles.
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> Enumeration of marine and other losses is necessarily incomplete, but they were quite severe, due, largely, to the fact that shipping throws caution to the winds, as it were, after the last of October, resting under the Utopian belief that the end of that month marks the close of tropical cyclone activity in these latitudes. Aside from the physical losses there was the more melancholy one—loss of life.
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> *Damage to truck.*—This was severe, on account of heavy rain, in the southeast the damage being centered chiefly in the Miami district; losses were not heavy in the Everglades, where the rainfall was much less. Truck suffered severely, also, along the track of the storm as it moved northeastward over the peninsula.
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> *Damage to fruit.*—The Citrus Exchange estimated the loss at 300,000 boxes, which, at $2 per box, evidences a formidable sum.
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> There were very many other losses that can not be enumerated, but in the aggregate they show that the storm approximated the usual disturbance of that character in paralyzing business and damaging marine interests.
>
> The losses of shipping were quite severe, as follows: The American schooner *Arcadia* was sunk; crew of 7 lost. The tug *Gwalia*, towing lumber barge from Mobile, went down. The crew was adrift on the barge; not known if rescued. The American schooner, *William Russell* sank off Fort Lauderdale; crew rescued. The American S. S. *Catopaxi*, Charleston to Cuba, crew of 30, was lost off the southeast coast. A "rum-runner" from Nassau was lost off Daytona Beach; crew of 6 was lost with 2,000 cases of liquor. The pleasure yacht *Miramar*, New York to Miami, was caught in the storm between Charleston and Savannah, December 1; it went down with the crew of 12.

The hurricane described above was only the third tropical storm of known hurricane intensity that developed after November 1 in the North Atlantic Ocean (including the Caribbean Sea and the Gulf of Mexico) since 1886. The first was that of November 17–29, 1888, which caused very severe damage to shipping from Cape Hatteras to Eastport, Me., and the second was the hurricane that devastated the western part of the

island of Jamaica during November 17–18, 1912. The last one is the latest hurricane of record in the North Atlantic during any year since more or less complete vessel reports became available in 1886. Its center passed the Virginia capes early on December 3, which is just a week later in the year than the hurricane of November, 1888, its center passing east of the Virginia capes on November 26. The last named was more severe, however, as it moved northeastward off the coast, and it caused great damage. The December, 1925, hurricane did not cause any great amount of damage, except over the Florida Peninsula; and, furthermore, it decreased in intensity after reaching the North Carolina coast. The highest wind velocity reported from any land station was 64 miles an hour from the northeast at Atlantic City, N. J. Cape Henry, Va., and Block Island, R. I., reported 60 miles an hour from the same direction.

Storm warnings were issued for portions of the Atlantic coast on the 5th, 8th, 9th, 12th, 19th, 22d, 25th, and 27th, and they were verified, as a rule. Velocities in excess of 50 miles an hour were reported from at least one station in connection with four of the storms for which warnings were issued.

Small-craft warnings were issued for limited sections of the Atlantic or east Gulf coasts on the 5th, 13th, 19th, 21st, and 28th. Warnings of northers were sent to the chief hydrographer, Cristobal, Panama Canal Zone, on the 22d and 28th.

No cold-wave warnings were issued until the 22d, when they were ordered for South Carolina, Georgia, extreme eastern Tennessee, extreme western North Carolina, and extreme northern Florida. The severe cold spell of the last week of the month came on rather gradually over parts of the Washington district, but cold-wave warnings were issued the evening of the 26th for Mississippi, Alabama, western Tennessee, and extreme northwestern Florida. The temperature fell to 2° at Anniston, Ala., 18° at Mobile, Ala., and Pensacola, Fla., 12° at Macon, Ga., and 24° at Jacksonville, Fla. At Tampa, Fla., the lowest was 34°.

Frost warnings were issued for portions of the extreme south on 16 dates during the month. On 5 dates warnings were issued for central Florida, the most important of which were those of the 22d and 23d.—*C. L. Mitchell.*