

NORTH PACIFIC OCEAN

551.506 (265.2)

By WILLIS E. HURD

A remarkable change took place in the atmospheric pressure of the central Aleutian region in September as compared with that of August. In the earlier month the Aleutian cyclone, on the average, had become practically nonexistent, except for a shallow depression covering the upper part of the Gulf of Alaska. The Pacific-California HIGH at that time extended northward over the central part of the ocean to Dutch Harbor, where the average was 30.04 inches. In September the HIGH covered the central and northeastern parts of the ocean, but the LOW had developed extraordinarily to less than average winter depth, the monthly averages at Dutch Harbor and St. Paul dropping each to 29.51 inches, with the minus departure from the August reading at Dutch Harbor amounting to 0.53 inch. As there was little pressure change between the months at Kodiak, it is seen that the centers of cyclonic activity in September operated principally to the westward of the Gulf of Alaska. The greatest intensifications of the Aleutian LOW occurred on the 13th and 24th.

Barometric data for several island and coast stations in west longitudes, including Point Barrow on the Arctic Ocean, are given in the following table:

TABLE 1.—Averages, departures, and extremes of atmospheric pressure at sea level at indicated hours, North Pacific Ocean and adjacent waters, September, 1929

Stations	Average pressure	Departure from normal	Highest	Date	Lowest	Date
	Inches	Inch	Inches		Inches	
Point Barrow ¹ 2	30.03	---	30.48	9th	29.74	17th.
Dutch Harbor ¹ 2	29.51	-0.25	30.06	18th	28.62	13th.
St. Paul ¹ 2	29.51	-0.19	30.22	7th	28.96	24th.
Kodiak ¹ 3	29.85	+0.15	30.20	7th	29.48	14th.
Midway Island ¹ 4	30.05	-0.02	30.28	26th	29.80	12th.
Honolulu ⁵	29.98	-0.02	30.05	29th	29.87	20th.
Juneau ⁵	30.12	+0.20	30.32	5th	29.62	13th.
Tatoosh Island ⁵ 6	30.03	+0.02	30.22	28th	29.75	16th.
San Francisco ⁵ 6	29.88	-0.10	30.05	28th	29.74	15th.
San Diego ⁵ 6	29.84	-0.04	29.99	28th	29.59	16th.

¹ P. m. observations only.

² For 29 days.

³ For 28 days.

⁴ For 27 days.

⁵ A. m. and p. m. observations.

⁶ Corrected to 24-hour mean.

⁷ Also on 25th.

No gales were reported by seamen as occurring along the American coast between the thirtieth and sixtieth parallels. But with the abrupt change barometrically from quiet summer to active autumn conditions in central higher latitudes of the Pacific, there occurred a considerable increase in storminess both as to numbers and force of the gales encountered by steamships traversing the more northerly routes between meridians 155° W. and 180°. In some localities here gales were observed on from five to seven days of the month, the forces ranging from 8 to 10. To the westward gales decreased in number almost to the Japanese coast, but on the 12th attained great violence between latitudes 40° and 50° N., longitudes 165° and 175° E., where whole gales to hurricane velocities were reported. Most heavily involved at this time was the American steamship *Yankee Arrow*, A. Andersen, master; A. H. Jones, second officer and observer. This vessel "hove to, with wind and sea on port bow, from 1 a. m. to 7 a. m." of the 12th, battling a northeast hurricane, lowest pressure 28.63 inches, in 44° 47' N., 172° 36' E.

Of the gales that swept the near coast waters, south and east, of Japan, practically all resulted from the pas-

sage of typhoons or milder tropical disturbances. High winds of this character, forces 8 to 10, were reported as of the 9th to 14th, inclusive, and on the 21st and 22d. Probably gales of greater force, though as yet unreported, blew off the south coast on the 29th and 30th, due to the presence there of the typhoon mentioned by the Rev. José Coronas, of the Philippine Weather Bureau, in his subjoined article. The Philippines typhoon of the 17th and 18th was reported by the Dutch steamship *Modjokerto*, which encountered a southwest gale of force 8, lowest barometer 29.68, a short distance outside of Manila, on the 18th.

Mexican west coast waters were visited by gales, some of hurricane intensity, on at least 10 days of the month. These resolved themselves into a principal tropical cyclone of the 10th to 18th, a perhaps local disturbance of the 19th, and a pronounced depression of the 23d and 24th. The major storm, being of considerable importance, is described in a separate article. The storm of the 19th may have been identified with the general disturbed conditions prevailing for several days off the Mexican coast, or it may have been a cyclone with individual characteristics. So far as reports show, however, it was experienced only by the American tanker *Nora*, which encountered strong to whole east to southwest gales between Acapulco and Manzanillo. The fresh to strong gales of the 23d and 24th are to be identified as belonging to a cyclonic wind system occurring south and southeast of the Gulf of Tehuantepec. The lowest pressure observed was 29.56 inches read on board the British steamship *Oilfield* on the 24th, in 15° N., 96° 30' W. This vessel, southbound, passed the center of the disturbance, with east changing to southeast wind, between 10 a. m. and noon, barometer thereafter rapidly rising. It is not yet known if the cyclone filled up or passed out to sea.

The prevailing wind direction at Honolulu was east, and the maximum velocity was at the rate of 22 miles an hour from the east on the 28th. The month here was one of the warmest Septembers on record.

Fog declined rapidly in occurrence over that part of the northern steamship routes west of the one hundred and eightieth meridian, the percentage falling from 50 in August to about 10 or 15 in September. Fog was slightly more frequent along the part of the upper routes lying south of the Gulf of Alaska, but was most frequent along the American coast from Alaska to the northern part of Lower California. Off most of the coast of the United States proper at least 50 per cent of the days had fog. The phenomenon occurred locally on the 6th off the Costa Rican coast and on the 9th in the lower part of the Gulf of Tehuantepec. Off the Washington and Oregon coasts visibility was often poor or obscured, due to smoke or combined smoke and fog. The American steamship *Admiral Peoples* on the 7th reported low visibility from Yaquina Head to the Columbia River, due to smoke, and the American steamship *Emma Alexander* further reported:

Left Victoria at 9.30 a. m., 15th. Encountered smoke in Straits, becoming dense off coasts of Washington and Oregon; 17th, heavy smoke to dense fog, all due to extensive forest fires.

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THE MEXICAN WEST COAST HURRICANE OF SEPTEMBER 10-18, 1929

By WILLIS E. HURD

This severe storm originated, so far as reports indicate, near or over the southwestern waters of the Gulf of Tehuantepec as early, at least, as the 10th, when the Japanese steamship *Havana Maru*, southbound, experienced a moderate north-northeasterly gale and falling

barometer. At 4 a. m. on the 11th the same vessel, near 15° N., 97° W., reported a fresh northeast gale, barometer down to 29.66. On the same day the American steamship *Iowan* met with gales from ESE., force 8-10, near 21° N., 107° W., with slightly depressed barometer. On the 12th the *Iowan* had gales of similar force from the east near 17° N., 101° W.

Radio reports of the 12th received by the French steamship *Texas* from several vessels, and furnished by her to the Weather Bureau, show that fresh gales to hurricane squalls from east, southeast, and southwest directions occurred between 15° and 17° N., 99° and 103° W. On the 13th and 14th the weather was stormy along much of the coast from slightly above Salina Cruz to the mouth of the Gulf of California, with heavy easterly to southeasterly gales reported from Acapulco, Manzanillo, and Mazatlan. On the 13th the cyclone had become undoubtedly severe, with the center localized at near 18° N., 104° W., where the *Texas* encountered a full easterly hurricane with very heavy rain early in the afternoon, lowest barometer 29.39. Later in the day, as she proceeded southward, her pressure rose, with diminishing southeast gales.

On this date the American steamship *Munaires*, bound toward the canal, ran into gales from northeast early in the morning, barometer 29.69, in 17° 20' N., 102° 10' W. Apparently she was hove to for the better part of the day, while the wind changed to east, then southeast, increasing to force 11 at 10 a. m., and decreasing to force 7 at 8 p. m. As the gale rose, however, so did the pressure, according to the report furnished by third officer and observer, O. R. Smith, the barometer reading 29.81 at the height of the storm. "There were no unusual weather conditions," said Mr. Smith, "to give warning of the approach of this storm excepting the heavy seas which were encountered some eight hours before the storm."

During the 14th and 15th no gales were reported higher than force 10, but it was apparent that the central area of the cyclone was moving up the coast and at no great distance from it.

On the 16th, although observations failed to come through from neighboring land stations, the full intensity of the storm at sea became manifest. The American steamship *Willpolo*, Balboa to San Diego, had a barometer of 28.94, wind ESE., 9, at 6 a. m., in 22° 51' N., 109° 53' W. At 6.30 the wind had increased to force 10, barometer 28.74; at 6.40 the wind had become an east hurricane, and at 7 the barometer read 28.32 (corrected). At about 7.30 the hurricane wind changed to north, then went into north-northwest at 8.10, barometer lowest at 28.28. At noon the wind was west, force 10, weather moderating. The American tanker *Nora* reported fresh gales during the afternoon well up in the Gulf of California.

The cyclone swept rapidly northward on the 16th with great loss of intensity, and entered southern California, lowest barometer at San Diego, 29.59. At morning observation of the 17th at this station the temperature attained the extraordinary height of 93°, the record maximum for that hour (4.45 a. m.), with wind off the desert. It was followed by sprinkles during a part of the forenoon, and at 4.10 p. m. by a maximum wind velocity of 28 miles from the southeast, which is the record velocity at San Diego for September. On the 18th all that remained of this Mexican hurricane was a shallow elongated low lying north and south to the eastward of San Francisco.

This is the first cyclone of the Mexican west coast during the 20-year period 1910-1929, known by the writer to have pursued a course thus northward into California. The only other storm of the period, the track of which has actually been traced into the extreme southwestern part of the United States, was that of September, 1921, which passed up the west coast of Mexico, caused damaging rains in southwestern Arizona, then went northeastward as a fully formed cyclone, and before dying out in October nearly crossed the Atlantic Ocean.

FURTHER NOTE ON THE PHILIPPINE TYPHOON OF APRIL 25-26, 1929

By WILLIS E. HURD

In the April issue of the REVIEW mention was made of a press report of a typhoon experienced April 25-26, 1929, by the American steamship *Edgefield*, Capt. W. H. Walker, Sagay, P. I., to San Pedro. The Weather Bureau now has Captain Walker's own report of the storm, which he characterized as being of small area but of great intensity and the worst of five typhoons of his experience. He noted that "we were approximately 300 miles from the place where the *Elkton* was lost with all hands in 1927."

At noon of the 24th the *Edgefield* was in latitude 14° 46' N., longitude 126° 50' E., wind NE., 5, barometer 29.62 (uncorrected), rough head sea. Twenty-four hours later she was in 16° 16' N., 128° 41' E., wind ENE., 6, barometer 29.57. At 3 a. m. of the 26th she was in the outer edge of the typhoon center, wind west, 12, barometer 28.10, pressure having fallen exactly 1 inch in two hours. Quoting now from the captain's report:

25th. Wind increasing rapidly as midnight approached and barometer falling, with tremendous confused sea.

26th. Center of typhoon passed over vessel about 3 a. m., with wind practically calm and atmosphere very oppressive. From 1.50 to 2.35 a. m., just before center, vessel refused to steer, owing to force of wind, and fuel oil was pumped overboard in effort to calm seas. After passage of center, weather and sea moderated rapidly.

TYPHOONS AND DEPRESSIONS—A DESTRUCTIVE TYPHOON OVER SOUTHERN AND CENTRAL LUZON ON SEPTEMBER 2 AND 3, 1929

By Rev. JOSÉ CORONAS, S. J.

[Weather Bureau, Manila, P. I.]

This is the first destructive typhoon we have had over the Philippines since the *Euzkadi* typhoon of last November. The track followed by this typhoon during the first two days of September was very dangerous for Manila, where all possible precautions had been taken. But fortunately the typhoon, which had been moving west by north, inclined northwestward just in time to save our city from a real calamity.

Our weather map showed the first signs of this typhoon at 6 a. m. of September 1, when the center was situated about 350 miles to the east by south of Manila not far from 127° longitude E. and 14° latitude N. It moved rather slowly westward, with a little inclination to the north, and was severely felt on the 2d in the sub-Province of Catanduanes and the Provinces of Sorsogon, Albay, Camarines Sur, and Camarines Norte. At 6 a. m. of the 3d the center passed very near to the northern coast of Camarines Norte, headed for Polillo Island and Infanta, a municipality of Tayabas Province situated about 45 miles to the east of Manila. Our observer of Infanta reported a barometric minimum of 722 millimeters (28.43 inches, gravity correction not