OCEAN GALES AND STORMS, FEBRUARY 1939—Continued

Vessel	Voyage		Position at time of lowest barometer		Gale began February	Time of lowest barometer, February	Gale ended February	Lowest barometer	Direction of wind when gale began	Direction and force of wind at time of lowest barometer	Direction of wind when gale ended	Direction and highest force of wind	Shifts of wind near time of lowest barometer
	From—	To—	Latitude	Longitude									
NORTH PACIFIC OCEAN—Continued			° ′	° ′				Inches					
Pres. Taft, Am. S. S.	Honolulu	Yokohama	34 37 N.	150 42 E.	10	Noon, 10.	11	29.62	NW.	NNW, 5.	NW.	NW, 9.	N-NW.
Peter Maersk, Dan. M. S.	Yokohama	Los Angeles	40 06 N.	151 54 E.	11	10p, 10.	11	29.46	NNW.	W, 7.	NW.	NNW, 8.	W-NNW.
Bralanta, Nor. M. S.	Los Angeles	Yokohama	34 42 N.	174 56 W.	10	11a, 11.	11	29.37	S.	SW, 6.	W.	W, 10.	SW-WSW.
Marchen Maersk, Dan.	do	do	34 00 N.	176 06 E.	11	1a, 12.	13	29.32	S.	SW, 9.	W.	WSW, 10.	SW-WSW.
Lightship #92, U. S.	On station		48 30 N.	125 00 W.	13	4p, 14.	13	[1]29.74		NE, 2.		SSE, 8.	
Bralanta, Nor. M. S.	Los Angeles	Yokohama	34 43 N.	178 35 E.	12	6p, 14.	15	29.41	W.	SW, 10.	WNW.	W, 10.	SW-W.
Zuiyo Maru, Jap. S. S.	Osaka	Los Angeles	[1]39 54 N.	174 03 W.	14	4a, 14.	15	28.97		WSW, 8.		WSW, 9.	
Huzisan Maru, Jap. M. S.	Yokohama	do	39 00 N.	159 00 E.	14	6a, 14.	14	29.50	WNW.	WNW, 8.	NW.	NW, 8.	WNW-NW.
Peter Maersk, Dan. M. S.	do	do	46 30 N.	174 00 W.	14	4p, 14.	14	28.83	NNE.	NNE, 8.	N.	NNE, 8.	NE-N.
Sawokla, Am., M. S.	Hong Kong	do	33 42 N.	155 07 E.	16	6a, 16.	16	29.25	SSE.	W, 8.	NNW.	SSW, 9.	SSW-NW.
Marchen Maersk, Dan. M. S.	Los Angeles	Yokohama	32 00 N.	157 21 E.	16	10a, 16.	16	29.38	S.	SW, 10.	N.	WSW, 10.	S-WNW.
Bralanta, Nor. M. S.	do	do	34 36 N.	170 14 E.	16	11p, 16.	17	29.21	S.	SW, 9.	W.	W, 12.	S-W.
Mindanao, Phil. S. S.	Manila	San Francisco	36 30 N.	176 54 E.	16	Noon, 17.	17	29.23	S.	WSW, 9.	W.	WSW, 9.	S-W.
Huzisan Maru, Jap. M. S.	Yokohama	Los Angeles	40 06 N.	178 02 E.	16	Noon, 17.	17	28.67	S.	SSW, 9.	SW.	SW, 11.	S-SW.
Getuyo Maru, Jap. M. S.	Kobe	do	45 42 N.	173 00 E.	17	3p, 17.	18	28.56	NE.	N, 10.	WSW.	N, 10.	NNE-NW.
Beckenham, Br. S. S.	Muroran	Vancouver, B. C.	46 11 N.	176 00 E.	17	2a, 18.	18	28.26	NNE.	NW, 8.	W.	NW, 8.	NNE-NW.
Sawokla, Am. M. S.	Hong Kong	Los Angeles	33 20 N.	174 07 E.	19	6a, 20.	20	29.61	SSW.	SW, 8.	WNW.	SW, 8.	SSW-W.
W. B. Walker, Br. M. S.	Yokohama	San Francisco	36 10 N.	146 55 E.	21	2a, 22.	22	29.19	ESE.	WSW, 8.	NW.	NNW, 10.	S-NNW.
Gefion, Nor. M. S.	Los Angeles	Kobe	32 58 N.	160 23 E.	22	10p, 22.	23	29.76	SW.	W, 9.	NW.	W, 10.	SSW-W.
Floridian, Am. S. S.	Balboa	Los Angeles	15 36 N.	96 36 W.	23	5p, 23.	23	29.88	NNW.	W, 3.	NE.	N, 8.	NE-W-NNW.
Skjelbred, Nor. M. S.	Yokohama	San Francisco	42 24 N.	167 36 E.	23	11a, 23.	24	29.42		ENE, 8.		ENE, 8.	
Pres. Coolidge, Am. S. S.	Honolulu	do	26 30 N.	149 24 W.	27	2a, 27.	27	30.10		E, 4.		E, 8.	

[1] Position approximate.

[2] Barometer uncorrected.

NORTH PACIFIC OCEAN, FEBRUARY 1939

By WILLIS E. HURD

Atmospheric pressure.—During most of February 1939 low pressure overlay the Bering Sea and the northwestern part of the North Pacific Ocean, with the average center in the Bering Sea. At St. Paul Island pressure for the month was 29.42 inches, which is 0.23 inch below the normal. The lowest barometer reading at St. Paul—also the lowest for the month in Pacific waters—was 28.00 inches on the 13th.

In the eastern North Pacific, particularly between the American coast and longitude 160° W., LOWS were unusually deficient for the month. Throughout middle latitudes in this area, pressure was almost unbrokenly high and at the crest, near 35°–45° N., 135° to 145° W., the barometer averaged close to 30.50 inches. Along the American coast, from Kodiak, Alaska, to Mazatlan, Mexico, pressure was abnormally high.

In the Far East the oceanic extension of the Asiatic anticyclone was unusually well developed, with the average pressure at Naha, Nansei Islands, 30.13 inches, which is 0.08 inch above the normal.

TABLE 1.—*Averages, departures, and extremes of atmospheric pressure at sea level, North Pacific Ocean, February 1939, at selected stations*

Station	Average pressure	Departure from normal	Highest	Date	Lowest	Date
	Inches	Inch	Inches		Inches	
Point Barrow	30.18	+0.06	30.82	6	29.64	13
Dutch Harbor	29.45	−.15	30.28	5	28.50	12
St. Paul	29.42	−.23	30.20	5	28.00	13
Kodiak	29.70	+.08	30.34	6	28.90	11
Juneau	29.99	+.07	30.44	19	29.00	11
Tatoosh Island	30.08	+.08	30.75	16	29.47	5
San Francisco	30.16	+.06	30.48	14	29.67	3
Mazatlan	29.95	+.02	30.02	5, 13, 14, 19	29.86	26
Honolulu	30.02	−.03	30.17	16	29.78	2
Midway Island	30.01	+.02	30.21	28	29.83	14
Guam	29.88	−.03	30.00	19	29.77	2
Manila	29.91	+.02	30.03	15	29.83	2-5, 11, 26
Hong Kong	30.07	+.01	30.27	15	29.96	1
Naha	30.13	+.08	30.33	8	29.86	28
Titijima	30.06	+.08	30.27	16	29.68	6
Petropavlosk	29.56	−.12	30.24	26	29.03	9

NOTE.—Data based on 1 daily observation only, except those for Juneau, Tatoosh Island, San Francisco, and Honolulu, which are based on 2 observations. Departures are computed from best available normals related to time of observation.

Storms and gales of the extratropics.—Storminess on the North Pacific during February was confined almost altogether, so far as reports indicate, to the northwestern quarter of the ocean, with southern boundary along the 30th parallel from longitude 140° E. to the 180th meridian, and thence northeastward to about the 50th parallel at longitude 150° W. Outside of this extensive area, the few gales reported occurred near the coastal waters of the United States, on the 1st to 3d and on the 8th, and the 13th, with the exception of two occurrences of tradewinds intensified to force 8 on the 2d and 27th northeast of the Hawaiian Islands, and an isolated gale of force 11 encountered by the U. S. A. T. *Ludington* near Midway Island on the 2d.

The month as a whole was far less stormy than the preceding January, both with respect to the intensity of the winds and to the areal extent of their occurrence. Only one gale in February was reported to have attained the strength of force 12. That was encountered on the 17th by the Norwegian motorship *Bralanta* near 34° N., 168° E. There were two gales of force 11, one already mentioned as experienced by the *Ludington* on the 2d; the other occurred on the 17th near 40° N., 178° E., where it was reported by the Japanese motorship *Huzisan Maru*. Winds attaining force 10 occurred on some seven or eight other dates, of which five, the 5th, 12th, 14th, 16th, and 23d, had the high winds between parallels 30° and 35° N., to the westward of the 180th meridian.

The lowest barometer reading reported by a ship in the month was 28.26 inches, read on the British steamship *Beckenham* during a northwest gale of force 8 on the 18th close to 46° N., 176° E.

At the beginning of the month stormy weather was mostly confined to two small areas, one in the neighborhood of 50° N., 150° to 160° W., on the 1st and 2d; the other to the near coastal region of Washington and Oregon on the 1st to 3d. In addition, isolated gales occurred near Midway Island and the eastern Hawaiian Islands on the 2d.

In east longitudes there were scattered gales beginning on the 4th and 5th, the strongest of which, a wind of force 10, occurred on the 5th in a small cyclone then centered off southeastern Japan. Gales continued to be localized

for the most part until the 10th over the great barometrically depressed area which covered the western part of the northern and central steamer routes. By the 11th the weather had become more generally stormy within the region north of the 30th parallel and west of longitude 170° W., with gales of force 8 to 10 reported from many parts of the area. From the 11th until the 17th the weather in general was the roughest of the month within the area mentioned. Following the 17th, gales were few and scattered, and only on the 22d and 23d, near 36° N., 147° E., and 33° N., 160° E., respectively, were they experienced of force higher than 8.

Tropical disturbances and gales.—Elsewhere in this issue of the REVIEW is a report by the Rev. Bernard F. Doucette, Weather Bureau, Manila, P. I., of a depression that occurred in the Far East during February 3–16, 1939.

In southern Mexican coastal waters, Tehuantepecers occurred as follows: Of force 9 on the 3d, force 10 on the 4th, force 7 on the 13th, and of force 8 on the 23d.

Fog.—The region of most frequent fog this month lay, roughly, between latitudes 35° and 47° N., longitudes 130° and 150° W., thus rather closely conforming to the crest of the eastern North Pacific anticyclone during the days of fog occurrence. Here fog was observed on 12 days between the 11th and 24th, inclusive. Off the Washington and Oregon coasts fog was reported on the 14th and 24th, and off the California coast, on the 14th and 15th. A number of observations of fog were made in upper mid-ocean on the 28th.

TYPHOONS AND DEPRESSIONS OVER THE FAR EAST, FEBRUARY 1939

BERNARD F. DOUCETTE, S. J.

[Weather Bureau, Manila, P. I.]

Depression, February 3–16, 1939.—A low center appeared about 250 miles south of Yap during the morning hours of February 3 and soon manifested the strength of a depression. This center moved in a westerly direction until it reached the regions about 200 miles east of southern Mindanao, where it remained stationary from February 7 to 9 inclusive. Late in the afternoon of February 9, it began to move along a northwesterly course toward Samar Island. It reached this island February 12, where it inclined to the north, and then to the northeast after passing San Bernardino Strait. It then moved northeast from the ocean regions east of southern Luzon, changing to the north-northeast, which caused it to pass about 120 miles north of the Bonins, February 15. It crossed the 150th meridian on February 16 on its course toward the Aleutian Islands and adjacent regions.

Throughout its course over the ocean regions east of Mindanao as well as over Samar Island, it seemed to be of minor importance. The barometers at the stations in Samar recorded values close to 752 mm (29.606 inches) on February 12 as the center inclined northward. Heavy rainfall occurred over Samar Island as well as neighboring islands during the progress of this storm. The Manila newspapers had reports from Surigao Province of extensive floods over northeastern Mindanao. From Butuan, Agusan Province, came reports that almost all the seeded land was inundated from February 8 to 13, when the rains decreased.

There are some interesting aspects concerning the upper winds during these days. During the last ten days of January there was a steady westerly current over the stations of the Dutch East Indies, velocities at many places reaching values as high as 50 k. p. h. and even more. At the same time, over Guam and the Philippines, there was an easterly current. It seemed that circulation could not form because the region of convergence of these two air streams was over or close to the Equator. February 1 and the following days the easterly current over Guam and the Philippines was quite constant in strength, there being no sudden increase in velocities, which were as high as 50 k. p. h. Very likely the center formed because of some variation in strength of the westerly current south of the Equator, but observations for vertification are not available at the time of writing this article. Then, February 7 to 9, the winds over Guam shifted more toward the southeast quadrant and weakened, while the velocities over the Philippine stations increased to values between 40 and 75 k. p. h. Cebu was the first station to show this increase, which appeared on February 7. This occurred as the center moved from its position about 200 miles east of Mindanao toward Samar Island. The shifting to the southwest quadrant first appeared at Zamboanga February 11, then at Cebu on the 12th. Zamboanga reported velocities higher than Cebu, but it must be remembered that conditions at Zamboanga were more favorable for longer ascents than at Cebu. On February 13, the center was recurving to the northeast and on February 14, the whole archipelago was under the influence of the easterly current again. South of the Philippines, the Dutch East Indies had the same conditions as during the last few days of January. No reports were received from February 4 to 9, but after the latter day, there was evidence of a west quadrant air stream with velocities between 15 and 75 k. p. h. reported. After February 13, the velocities (not all stations reported) weakened as far as could be known.

In conclusion, the writer considers the main interest in this situation to consist in the fact that a definite center formed between these two air streams at the time of the year when the air of the Northern Hemisphere is stable, thus eliminating to a great extent the effect of violent convection. Because of this aspect, it might be possible to learn more about the causes of the variations in the velocities of the air streams by a more detailed and extensive study of the situation which prevailed during these days.