

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

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*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 verification 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.