wegian motorship *Evita*, which met an east gale of force 8, lowest barometer 1,005.1 millibars (29.68 inches), in 25°01′ N., 128°28′ E.

A full report on the typhoons and depressions of the Far East from the Weather Bureau, Manila, P. I., follows below.

Two small disturbances occurred in the southeastern Pacific Tropics. In the first, on the 19th, the Norwegian motorship *Thor 1*, in 17°30′ N., 118°40′ W., experienced a wind no higher than force 7, from north-northeast, but there was a wind shift from northeast to south as the ship crossed the LOW, with lowest observed barometer of 1,000.7 millibars (29.55 inches).

In the second, on the 29th, the American steamer *Susan V. Luckenbach* encountered a strong east gale at noon, lowest barometer 1,009. 8 millibars (29.82 inches), close in off the Mexican coast about midway between Acapulco and Manzanillo. At evening observation of the 29th a radio message from the Italian steamer *Leme*, up the coast near Manzanillo, reported a north-northeast gale of force 9, barometer 1,000 millibars (29.53 inches), as the disturbance went inland.

Fog.—Fog had increased greatly over nearly all northern and upper middle waters of the North Pacific since the previous June. The fog belt in open ocean extended between about longitude 138° W. nearly to the Japanese coast. In west longitudes its southern limit was close to the 40th parallel, but in east longitudes the southern boundary was close to 35° N. Along the northern routes there was some 20 to 35 percent or more of fog between longitudes 150° W. and 145° E., with the most frequent occurrences as a rule about midway between the western Aleutians and central Japan. Along the American coast fog was abnormally frequent off California, where it was reported on 24 days. There were 8 days with fog off Lower California, and 11 off Washington, mostly in or at the entrance to the Strait of Juan de Fuca. Two days were observed with fog near the Mexican coast south of the Gulf of California.

TYPHOONS AND DEPRESSIONS OVER THE FAR EAST JULY 1939

By BERNARD F. DOUCETTE, S. J.

[Weather Bureau, Manila, P. I.]

Typhoon, July 7–12, 1939 (Northern).—This disturbance probably originated over the regions west-southwest of the Bonin Islands and first affected the Nansei (Loochoo) Islands during the afternoon of July 7, at that time being central about 400 miles east of Naha. The storm moved in a northwesterly direction, passing close to and southwest of Oshima, into the Eastern Sea. A change to the north over the Yellow Sea brought the center to the northern part of Chosen (Korea) where it recurved to the northeast and east as it moved toward the Pacific Ocean. The 2 p. m. observation, July 8, from Oshima showed a northeast wind, force 8 blowing, with a pressure value of 733.5 mm. (978.0 mb.). Naha, at the same time, had north-northwest winds, force 4, with 751.0 mm. (1,001.3 mb.) and Borodino Island reported south-southwest winds, force 4, and 752.7 mm. (1,003.5 mb.) for pressure.

Typhoon, July 7–13, 1939 (Southern).—This typhoon first appeared as a disturbance secondary to the typhoon described above and intensified when the primary storm had moved across the Eastern Sea. As a depression, central about 350 miles east-northeast of San Bernardino Strait at 6 a. m., July 7, it moved a short distance to the west-northwest, then northwest and inclined to the north. It intensified to typhoon strength when east of Balintang Channel and then moved north-northeast for a short distance. The morning weather map of July 10 had the center located about 300 miles east-southeast of Ishigakijima from which position it began a rapid northwesterly motion. The center crossed the Eastern Sea during July 11 and was entering the coast between Gutzlaff and Kamen during the morning of the next day. It passed close to and southwest of Shanghai during the late forenoon and early afternoon (July 12) and continued along a course almost parallel to the coast line. It disappeared over the continent the next day.

Pressure values and wind observations received from Shanghai on July 12 are as follows: At 6 a. m. pressure was 747.4 mm. (996.4 mb.) with northeast winds, force 7. At 2 p. m. the barometers recorded 744.4 mm. (992.4 mb.) with east-northeast winds, force 12. Newspapers printed dispatches in which it was stated that the winds reached velocities as high as 80 miles per hour and that at least six persons were killed in Shanghai because of this storm.

Typhoon, July 10–17, 1939.—Forming rather quickly about 120 miles west of northern Luzon, this typhoon moved northwest and changed its direction to the northeast after about one day's progress away from the Philippines. It moved across the western part of the Balintang and Bashi Channels to the ocean regions east of Formosa, where it inclined to the north, then northwest, thus crossing northern Formosa and the Formosa Channel and passing into the continent. It disappeared about 500 miles away from the coast line after moving northwest and west.

The afternoon situation west of northern Luzon, July 10, indicated the formation of a new disturbance. The S. S. *Mausang*, en route to Hong Kong, reported from various positions about 180 miles west of Baguio pressure values between 749 and 748 mm. (998.6 and 997.3 mb.), with winds of force 6 from the north-northwest and west. The S. S. *Tjikarang*, at 2 p. m. Manila time, had winds of force 5 from the north-northwest with pressure at 749.0 mm. (998.6 mb.), the ship's position being latitude 18.7° N, longitude 116.6 E. Vigan and Laoag, situated along the western coast of Luzon, had southwest and south winds, force 3, with pressure at 749.5 mm. (999.3 mb.).

It seems that the north quadrant winds due to the typhoon preceding this storm interacted with the strong southwesterly current to form this typhoon. The pilot balloon observation at Aparri on the afternoon of the 10th had northwest winds at some levels which could be caused by the typhoon center 550 miles northeast of the station.

Typhoon, July 15–20, 1939.—As a low-pressure area, then depression, this disturbance moved in a northwesterly direction from the ocean regions about halfway between the Philippines and the Mariana Islands. The morning of the 18th found the storm intense enough to be classified as a typhoon, central about 400 miles northeast of Aparri, Cagayan Pr. For a few hours it moved north-northeast, then changed to the northwest when directly east of southern Formosa. The storm entered the continent July 20 about 120 miles south of Shanghai and disappeared the next day.

The morning observations, July 19, from Ishigakijima, Nansei Islands, showed a pressure of 748.0 mm. (997.3 mb.) with calm. At Naha, Nansei Islands, southeast winds, force 3, were reported, with pressure at 749.5 mm. (999.3 mb.).

Typhoon, July 20–27, 1939.—Similar to the typhoon just described, a depression formed over the ocean regions between the Philippines and the Mariana Islands and then moved northwest to a position about 250 miles east-by-north of Basco, Batanes Islands, where it was stationary