

tunately, ships' reports were unusually few from the ocean's western half, but such as were received from that area gave no indication of winds stronger than force 6 or 7 in the extreme being experienced.

For the upper eastern half of the ocean, gales were reported on 2 days. The earlier, on the 5th, was of force 8, experienced by the American steamship *Denali*, near 54° N., 162° W. The latter, on the 9th, gave evidence of considerable local energy in connection with a cyclone over and south of the Gulf of Alaska. Between 7 and 8 a. m. of that date, the American steamer *W. S. Miller* encountered a west wind of force 11, lowest barometer 994.9 millibars (29.38 inches), in 49°42' N., 146°30' W.

**Tropical cyclones.**—Subjoined is a report by the Rev. Bernard F. Doucette, S. J., Weather Bureau, Manila, P. I., on three depressions and four typhoons that occurred over the Far East during the month.

In the southeastern Tropics a minor tropical cyclone with a rapid west-northwestward progression, is evidenced by the reports of the three following ships: The American steamer *Aguidale* met an east wind of force 7, with slightly depressed barometer, south of Acapulco on the 3d. On the 4th the steamship *Liberator* encountered an east-southeast gale of force 8, lowest barometer 1,005.4 millibars (29.69 inches), near 16° N., 113° W. On the 5th the steamship *City of Alma*, near 18° N., 120° W., ran into a north-northeast gale of force 8, with barometer at 1,008.5 millibars (29.78 inches), uncorrected.

On the 17th and 18th slightly disturbed conditions, with some fall in barometer, were observed off the lower Central American coast. These were followed by the report of a north-northeast wind of force 7 on the 20th south of the Gulf of Tehuantepec. The observations point to the existence of an incipient depression moving northwestward from a position in unusually low latitudes in these waters.

**Fog.**—Some 10 to 20 percent of days with fog was reported along the central and western parts of the northern steamship routes. This is much less than the normal occurrence for August, and undoubtedly the unusual lack of observations accounted, in some measure at least, for the apparent fog deficiency. Along the American coast fog was reported as follows: Off Washington on 5 days; off Oregon on 6 days; and off California on 14 days.

#### TYPHOONS AND DEPRESSIONS OVER THE FAR EAST

By BERNARD F. DOUCETTE, S. J.

[Weather Bureau, Manila, P. I.]

**Depression, August 2-5, 1940.**—A depression, apparently of minor importance, formed about halfway between the Philippines and the Mariana Islands. It moved along a north-northwesterly course, inclining to the north and northeast, thus passing about 150 miles northwest of the Bonins as a weak low-pressure area.

**Depression, August 12-15, 1940.**—A mild depression formed about 400 miles east-northeast of San Bernardino Strait, and moved west and west-northwest to the ocean regions about 300 miles east of northern Luzon where it disappeared. There was no evidence of intensification during the course of this disturbance.

**Typhoon, August 13-18, 1940.**—A weak depression was central about 60 miles east of Mindoro during the morning hours of August 13. This disturbance moved southwestward and westward, passing south of Mindoro and Culion Islands on its way to the China Sea. Moving west, then west-northwest, it proceeded toward Indo-

china, apparently a depression during these days. When about 120 miles southeast of Tourane, August 16, it was definitely a typhoon, small in area, but with pressure falling fast. The typhoon moved northwest, almost parallel to the coast, and disappeared over the Gulf of Tong King. Pressure values at coastal stations, Tourane to Vinh, were close to 750 mm. (999.9 mb.), August 16 to 18.

**Typhoon, August 14-24, 1940.**—As a low-pressure area east of Guam, this storm moved northwesterly, then westerly, apparently increasing to depression strength. On August 16, it became a typhoon, moving west and west-southwest for 1 day, reaching the 15th parallel of latitude. On August 17, it was threatening central Luzon, but a shift to the north-northwest placed northern Luzon in danger. The center entered northern Luzon late in the afternoon of August 18 north of Palanan, Isabela Province, passed between Tuguegarao and Aparri, Cagayan Province, and entered Balintang Channel north of Laoag, Ilocos Norte Province, August 19, moving west-northwest. Over the northern China Sea, the center moved close to and north of Pratas, threatening the locality of Hong Kong. It shifted to the west, however, the center passing very close to Gap Rock, after which the storm moved southwest to Hainan Island. A change to the west brought the center across the Gulf of Tong King and into the Continent about 60 miles south of Phulien, where it weakened. No trace of the storm could be found on the weather maps of August 25.

Barometric minima recorded at northern Luzon stations are listed as follows: Palanan, Isabela Province had 731.3 mm. (975.0 mb.) with northwest winds of force 9, at 5:30 p. m. of the 18th; Tuguegarao, Cagayan Province had 736.9 mm. (982.5 mb.), with west winds of force 7, at 11:05 p. m. of the 18th; Aparri, Cagayan Province had 733.9 mm. (978.5 mb.), with southeast winds force 7, at 3:45 a. m. of the 19th; Calayan, Babuyan Islands, had 742.93 mm. (990.5 mb.), with southeast winds of force 5, at 2 p. m. of the 19th; Laoag, Ilocos Norte Province had 742.9 mm. (990.5 mb.) with northwest winds of force 6, at 6:20 a. m. of the 19th. A few days later, after the storm had passed Hong Kong, the following message was received from the Royal Observatory at Hong Kong: "Barometric minimum Hong Kong Observatory, 29.215; Gap Rock, 29.07; center probably 28.8, maximum wind gust, 83 m. p. h."

Nine lives were lost as the typhoon crossed Luzon, most of these casualties occurring in central Luzon. The steamship *Nanyo Maru* was wrecked near Nagabungan, Pasugun, Ilocos Norte Province, the ship being totally destroyed, but the passengers and crew were rescued. The provinces of central Luzon had floods over large areas for a few days. No other reports of destruction were published.

The preceding typhoon, August 13-18, formed as the southwesterly current moved across the southern part of the China Sea to Zamboanga and Cebu, this taking place on August 10 and following days. Then the depression (for it apparently was not of typhoon strength as it crossed the China Sea) intensified when the circulation was able to draw upon the rather strong southwesterly current flowing over Thailand and southern Indochina. This process occurred while a disturbance over the Pacific was approaching the archipelago, and the same procedure, so it seems, took place over the southern Philippines. Velocities of the wind over Cebu and Zamboanga increased to values of 50 k. p. h. or more after August 16, Cebu usually being stronger than Zamboanga. A few days