

A press report of August 8 from Tokyo gave information of a severe typhoon approaching Kyushu Island. While we have no information as to the earlier movements of the storm, a special report from the British R. M. S. *Empress of Canada*, Capt. W. T. Kinley, Fourth Officer E. R. Shaw, observer, shows the existence on the 9th of a severe storm east of Shanghai. This steamer, Shanghai to Hong Kong, ran into the gale, of force 8-9 from the north, at 12 noon (China coast time), barometer 29.32. At 1 p. m. the wind had increased to force 11 from the north-northwest, in 30°56' N., 122°37' E. At 2 p. m. the vessel entered the cyclone center, with light wind, and barometer 28.78. At 3 p. m. the wind was south, force 10, thereafter diminishing, as the typhoon went inland.

On the 7 p. m. (E. S. T.) map of August 31 a typhoon is shown entering the south coast of Japan near Yokohama. Press reports of September 1 indicate the serious nature of the storm as it affected Yokohama, Tokyo, and neighboring towns and cities. Some 99 persons were reported to have been killed, while damage to property was placed at approximately \$28,000,000. About 15,000 of the inhabitants of Tokyo alone were estimated to have been rendered homeless. There was much damage done to shipping, particularly in the harbor of Yokohama, where 34 passenger and freight ships were driven aground and hundreds of small boats were wrecked.

Disturbances of the Southeastern North Pacific.—There are indications from isolated reports that three tropical disturbances occurred in the waters west of Mexico during August. The American steamer *Mobile City*, Honolulu to Balboa, ran into the northerly winds of a westward moving depression late on August 1, and at 4 a. m. of the 2d, in 16°54' N., 114°42' W., had a barometer reading of 29.68 inches. The vessel ran out of the depression on the afternoon of the 2d, after experiencing a maximum wind of force 7 from the southwest.

Early on the 4th the same ship encountered a northeast gale of force 9, lowest barometer 29.82, near 15° N., 106° W. Later in the day the wind changed to southeast with lessened force. The indication is that the vessel had passed through the northern half of a second tropical disturbance moving westward in these waters.

The third disturbance was located as a depression over or close to the eastward of the Revillagigedo Islands on the morning of August 18. Twenty-four hours later it lay west or west-southwest of Cape San Lucas, with pressure reported down to 29.50 inches or lower at or near the center. The only gale, a wind of force 8, in connection with it, was reported by an unidentified ship near 25° N., 114° W., on the morning of the 19th. Our 7 p. m. (E. S. T.) map of the 19th shows no further evidence of the cyclone.

Fog.—Along the central part of the northern routes, specifically between about latitudes 44° and 51° N., longitudes 155° and 175° W., there was a concentration of fog, unusual for any summer month in that locality. Over this region fog was reported on at least 23 of the first 26 days of the month. Westward, fog diminished to about 4 days of occurrence east of northern Japan, and eastward it diminished to about 3 days in the coastal waters of Washington and Oregon. South of the 40th parallel there were only isolated occurrences of fog over the ocean, except along the California coast when it was reported on 9 days, and along the Lower California coast, on 3 days.

LATE REPORT: TYPHOONS AND DEPRESSIONS OVER THE FAR EAST, JULY 1938

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Typhoon, July 4-10, 1938.—From July 4 to 7 a very shallow low pressure area moved from the Pacific across the Visayan Islands into the China Sea along a west-northwesterly course. As the disturbance approached the regions south of the Paracel Islands and Reefs, it quickly intensified into a small but violent typhoon, which inclined to the northwest, thus bringing the center to Hainan Island where it recurved to the northeast. It moved across the coast into the Continent where it disappeared during the afternoon and evening hours of July 10.

When this disturbance was crossing the Philippines, pressure values were between 755.0 mm and 756.5 mm (29.724 and 29.783 in.) with only slight indications of circulation. At Manila, the barograph trace during the early morning hours (2 to 5 a. m.) July 6, showed an irregular fall and rise of pressure. Compared with the traces on the days before and after, it was unusual inasmuch as it happened only that day. There was some rain accompanying this change of pressure; a wind shift from northeast to northwest and back to northeast (surface winds) occurred also, these events happening when the low pressure center was south of Manila. Barograph records from the provincial stations are not available at the time of writing; a later study of these may show the progress of the disturbance across the archipelago.

Observations from the S. S. *Conte Verde* gave first indications that the disturbance was intensifying. On July 7, 6 a. m. (Manila time) a pressure of 750.2 mm (29.535 in.) with east-northeast winds force 6, in latitude 16.0° N., longitude 113.1° E., was reported. July 8, 2 p. m., the recently established station on one of the Paracel Islands reported a pressure of 749.8 mm (29.520 in.), with south-southeast winds force 9.

Upper winds reported during the period of this storm indicate that two simultaneous surges occurred as it was crossing the Philippines. At Manila, the velocities of a southeasterly current increased from values of about 20 k. p. h. on July 5 to values between 30 and 60 k. p. h. on July 6, the velocities weakening the next day. No increase was shown at the other Philippine aerological stations. Malaya pilots received during this period also show an increase of values between 5 and 45 k. p. h. on July 4 to values between 25 and 60 k. p. h. on July 6, the direction being from the southwest quadrant. On July 7 the southwest current decreased, and on the 8th the direction changed to the east quadrant, according to the data available.

As the disturbance moved across the China Sea and approached the region of the Paracels, a southwesterly current was steadily flowing across Siam and Indio China. The proximity of the typhoon affected only the upper winds of Tourane, changing them to the northwest quadrant, no long ascents being reported and velocities between 10 and 25 k. p. h. recorded. On the 8th, the directions over Tourane changed to the northeast aloft, the typhoon being about 180 miles to the east and moving northwest. At the same time a surge seemed to have occurred over Bandon, Siam, and Saigon, Indo China. At Bandon,

velocities of 5 to 30 k. p. h. were reported on July 6 and 7, increasing to about 60 k. p. h. July 9, the directions being from the southwest quadrant. Saigon, Indo China, did not report every day, but the ascents available indicate that the southwest current surged over that region on its way to the storm center. All pilots on July 10 showed weakening velocities. These reports are indications of the way the velocities of the upper winds can be used for forecasting purposes.

Depression, July 14-21, 1938.—A mild depression, apparently of minor importance, formed about 400 miles south-southeast of Guam, moved in a west-northwesterly direction to a position about 300 miles east-northeast of San Bernardino Strait. From this location it moved in a northerly direction, filling up over the regions east of Balintang Channel.

Typhoon, July 16-23, 1938.—According to observations available at the time of preparing this account, this disturbance manifested the intensity of a typhoon for only 1 day, after traversing a course from the northern part of the Mariana Islands. As a weak depression or a low pressure area, it first moved north-northeast, inclined to the north, then north-northwest and again north, thus reaching the ocean regions east of central Japan. On July 22, the 0000 and 1200 GCT observations from the S. S. *Pres. Cleveland* showed that an active typhoon had formed. From latitude 35.0° N, longitude 146.8° E, south-southeast winds force 11, with pressure 750.8 mm (29.559 in.) were reported. This was the 1200 GCT observation. The preceding 0000 GCT observation had the same pressure value, but with winds of force 10 from the north in latitude 34.9° N, longitude 143.1° E. On July 23, it seemed that the center had weakened as it changed its course to the east-northeast.

Typhoon, July 17-19, 1938.—A low pressure area, central about 300 miles east of the southern coast of Indochina, quickly intensified into a typhoon during the afternoon hours of July 17. This small, but active center moved west-northwest to the coast, entering Indochina a short distance south of Tourane July 18. The next morning it was located about 120 miles northwest of Tourane, decreasing in strength so much that no trace of it could be found the same afternoon.

A study of the upper winds available at the time of writing this article does not bring out much evidence of any surges. The pilots from Indo China are not sufficient for deriving any conclusions. The west and southwest winds over Siam from July 12 to 16 had velocities ranging from 20 to 60 k. p. h. Bandon, however, had low values on July 13 and 14, and increased to values between 35 and 70 k. p. h. on July 17. These values were maintained until July 23. Pilots from the Straits Settlements indicated an increase of the southwest quadrant current velocities during the 4 days, July 12 to 15, first reporting values between 5 and 30 k. p. h. and then indicating values between 15 and 60 k. p. h. After July 17, the velocities weakened considerably. Over the Philippines, there was nothing worth mentioning except the data from Zamboanga. There, July 15 and 16, the velocities of the southwest winds increased to values of 70 k. p. h. and maintained them. There also was a tendency for the directions to veer to the northwest quadrant aloft. On July 18 and 19, the velocities decreased to values around 20 and 30 k. p. h. A comparison of these values with the velocities reported from Indo China (about 5 to 20 k. p. h. in the few pilots received) at places so much closer to the storm center is interesting, and shows the power of the southwest current of air over the China Sea.