over the eastern half, so that the frequency of formation was about the same in both regions, ranging from 10 to 25 per cent. Along the American coast fog was observed most frequently between Vancouver and Cape San Lucas, the highest percentage, 30 to 35, being between the thirtieth and fortieth parallels.

Whirlwind.—Mr. William J. Rae, third officer of the Canadian steamer *City of Victoria*, Capt. J. MacPhail, Pacific coast toward China, reports as follows:

Tuesday, September 25, 9:30 a. m., apparent time at ship in latitude 37° 50′ N., longitude 134° 30′ E., experienced a miniature tornado or whirlpool. It approached ship stern on from SW. ½ W. (true), about 150 feet diameter, visible on water below a patch of heavy A. Cu. clouds in squall form, all moving with anticlockwise motion. It passed from stern over ship off port quarter, turning ship 4 points off its course with helm hard against it. It moved approximately 6 to 8 miles per hour, spiraling in force of strong gale, breaking away lifeboat cover stops and lifting light timbers in deck cargo

TWO PACIFIC-CHINA AND ONE PACIFIC-JAPAN TYPHOONS IN SEPTEMBER, 1928

By Rev. José Coronas, S. J.

[Weather Bureau, Manila, P. I.]

The most important typhoons of the month of September were two that crossed the great portion of the Pacific from the Ladrone Islands to the China coast and then entered eastern China, and one that moved from the neighborhood of Guam to the central part of Japan. There was not a single well-developed typhoon over the Philippines during the whole month.

Two Pacific-China typhoons, August 26 to September 15.—The first of these typhoons was probably formed on August 26 to 27 to the SSW. of Guam near 143° longitude E. and 11° latitude N. It moved NNW. on the 27th and inclined westward on the 28th and 29th, while its rate of progress was much decreased during these two days. A practically west direction was kept by the typhoon on the 30th of August and 1st of September. In the afternoon of September 2, when the center was about 300 miles to the east of northern Luzon, the typhoon took a northwesterly direction toward Formosa, traversing the northern part of this island during the night of the 5th and early morning of the 6th. A new and very pronounced inclination of the track to the west was noticed on the Formosa Channel; but once in China, the typhoon recurved to the N. and N. by E. on the 7th, the center passing west and northwest of Shanghai in the morning of the 8th.

The approximate positions of the typhoon at 6 a. m. of September 1 to 8 were as follows:

September 1, 6 a. m. 132° 15′ longitude E., 16° 30′ latitude N.
September 2, 6 a. m. 128° 20′ longitude E., 16° 55′ latitude N.
September 3, 6 a. m. 126° 30′ longitude E., 17° 55′ latitude N.
September 4, 6 a. m. 124° 50′ longitude E., 20° 00′ latitude N.
September 5, 6 a. m. 122° 35′ longitude E., 22° 20′ latitude N.
September 6, 6 a. m. 121° 00′ longitude E., 24° 30′ latitude N.
September 7, 6 a. m. 117° 45′ longitude E., 25° 25′ latitude N.
September 8, 6 a. m. 117° 45′ longitude E., 30° 00′ latitude N.

The second Pacific-China typhoon was shown by our weather maps of the 5th and 6th to the northeast of Guam near 147° or 148° longitude E. and 16° latitude N. It moved northwestward until the 9th, when it began to incline to the west about 200 miles south of the Bonins. The steamer *Steel Scientist* was well under the influence of this typhoon to the southeast and south of the Bonins on the 8th and 9th, when very strong winds were experienced from the SE. and S. quadrants. The typhoon moved almost due W. on the 10th and 11th, WNW. and NW. on the 12th, and again westward on the 13th and morning of the 14th. Like the preceding one, it recurved to the north over eastern China and passed west of Shanghai during the night of the 14th. According to press dispatches, "following torrential rains, Shanghai was visited during this typhoon by floods the like of which had not been seen since 1905. Various parts of the international settlement and the French concession were under 18 inches of water. The rainfall during 24 hours was approximately 8 inches."

The approximate positions of the center during the period 8th to 15th were as follows:

September 8, 6 a. m. 142° 30′ longitude E., 22° 40′ latitude N.
September 9, 6 a. m. 141° 10′ longitude E., 23° 50′ latitude N.
September 10, 6 a. m. 137° 30′ longitude E., 25° 00′ latitude N.
September 11, 6 a. m. 134° 10′ longitude E., 25° 00′ latitude N.
September 12, 6 a. m. 130° 50′ longitude E., 25° 05′ latitude N.
September 13, 6 a. m. 125° 55′ longitude E., 27° 00′ latitude N.
September 14, 6 a. m. 122° 50′ longitude E., 28° 00′ latitude N.
September 15, 6 a. m. 119° 00′ longitude E., 32° 30′ latitude N.

The Pacific-Japan typhoon, September 18 to 25.—The first part of this typhoon is rather indefinite, although it is probable that it formed on the 18th to 19th to the southwest of Guam near 142° longitude E. and 11° latitude N. It moved probably N. or NNW. during the whole track from the 19th until it reached Japan to the west of Tokyo in the evening of the 24th. The center could be seen in our weather maps passing west of the Bonins in the afternoon of the 23d. The storm probably filled up on the 25th over the Japan Sea close to the western coast of Japan.

Besides these three well-developed typhoons, our weather maps showed during the month five other centers of depressions or typhoons over the Far East, but they were either typhoons of an indefinite track or depressions of little importance. There were 3 over the Pacific between the Ladrone Islands and the Philippines, 1 over the China Sea in the neighborhood of the Paracels, and 1 over the Balintang Channel and the southern part of Formosa.