

Cyclones and gales.—There were at least four major progressive cyclones which occurred in November on the North Pacific. The earliest was that which originated on October 29 over eastern China, and caused severe gales on the 31st, east of Japan. On November 1 this storm was apparently of lessened intensity, with reported winds not exceeding 9 in force, near the fortieth parallel, between 145° and 155° east longitude. On the 2d and 3d, however, as it entered the Aleutian region and intensified the low already existent there, rougher weather resulted, with gales of force 11 reported from near latitude 50° N., between longitudes 170° E. and 180°. On the 3d and 4th it moved rapidly into the Gulf of Alaska, where it remained as an oscillating disturbance until about the 10th.

The second cyclone was that of the 9th to 12th which came out of Asia below Vladivostok and died out in the eastern part of the Bering Sea. This storm, however, inasmuch as it traversed a northerly region across the Sea of Okhotsk and Kamchatka, did not seriously affect any shipping along the trans-Pacific routes.

The third cyclone crossed the Yellow Sea from China on the 15th, and the Japan Sea and northern Japan on the 16th. On the 17th, when central south of the Kuril Islands, although then apparently of no great barometric depth, it was productive of hurricane velocities, as indicated by the report of the steamship *Ayaha Maru*, and on the 18th, farther eastward, by gales of full storm force. On the 19th and 20th the cyclone greatly intensified the Aleutian low over the eastern part of the Bering Sea and the upper waters of the Gulf of Alaska, and on the following day was central, diminishing, in the Canadian Northwest.

The fourth major traveling cyclone, although shorter in extent of water area traversed, was by no means unimportant. It probably originated on the 16th or 17th as a minor Aleutian disturbance west of the Peninsula of Alaska. On the 18th it had become a powerful cyclone in the Gulf of Alaska, with the barometer at Kodiak falling to its minimum of the month, 28.30 inches. This cyclone moved northward during the 19th and 20th, after which it no longer affected the sea. During its passage of the western part of the gulf it caused high winds, with a maximum recorded force of 11 on the 18th, over a considerable region. The period of great storm intensity, 17th to 19th, south of Alaska, was the heaviest of the month, and during its continuance two distinct and progressive cyclone centers passed over the island of Kodiak.

A traveling cyclone of much less intensity than the foregoing originated near the Hawaiian Islands about the 22d and was central over the northern extremity of the Gulf of Alaska on the 27th, after a passage between two extensive Pacific anticyclones. A few gales, with maximum reported force of 9, attended its northward course.

The month as a whole was little if any stormier than October, the varying degrees of storminess between the months being mostly local. There were fewer days with severe weather in the waters east of Japan, maximum velocities of force 10 east of Hondo and Yezo on the 12th, 21st, and 22d occurring instead of the storm and hurricane velocities of October 26 to 31. In general, south of the Aleutians, although the number of days with gales was probably not greater than in October, the winds were of somewhat higher force, owing to the greater intensity of the lows, forces 9 and 10 being about as

frequent this month as were the forces of 8 in the previous month. Their numbers may be determined by reference to Table 1. Between Kodiak and the mainland to the northward hurricane winds from the northeast occurred on the 5th. Scattered strong to whole gales were experienced east of Midway Island on the 10th, and at some distance off the California coast on the 15th and 16th, the latter resulting from cyclonic activity extending far southward from Alaskan waters.

Few high wind velocities occurred except locally within the tropics. A fresh northeast gale was experienced east of the Mariannas on the 8th, in connection with a disturbance of low latitudes that also caused fresh gales ten degrees to the northward on the 11th. To the southeastward of the Hawaiian Islands fresh east and northeast gales on the 13th and 14th indicated merely a strengthening of the trades due to intensified high pressure gradients.

Over and south of the Gulf of Tehuantepec fresh to strong or whole gales blowing as northers, due to strong anticyclones extending southward from the United States, occurred from the 1st to 6th, and on the 23d, 24th, and 27th.

At Honolulu the prevailing direction of the wind continued from the east, with a maximum velocity of 28 miles an hour from the same direction on the 16th.

Fog.—The number of days with fog in November lessened appreciably in most localities over the number in October. There were widely separated occurrences of fog on six days, as reported from upper east longitudes, and approximately the same number in upper and central waters of west longitudes. In no part of the ocean away from the coasts was fog reported on more than three days for a given locality. The frequency was somewhat greater along the American coast, and between Eureka and central Lower California fog was encountered on from six to eight days.

TYPHOONS AND DEPRESSIONS

A VERY SMALL TYPHOON OVER THE VISAYAN ISLANDS, NOVEMBER 2 TO 3, 1930

By REV. JOSÉ CORONAS, S. J.

Weather Bureau, Manila, P. I.

After two months of an extraordinary absence of typhoons, the Philippines were suddenly visited by a very small typhoon during the night of November 2 to 3. Because of its small diameter and of its great rate of progress, the typhoon entered the Archipelago without giving sufficient time for any warning. The center entered the eastern coast of southern Samar at about 9 p. m. of the 2d; it passed close to Tacloban at about 11 p. m.; and, after traversing the northern part of Leyte, Cebu, and Negros Islands, it passed very near to Iloilo at about 5.30 a. m. of November 3. The typhoon moved from Leyte to Iloilo at the extraordinary rate of over 22 miles per hour. With the exception of the portion of the track between Tacloban and Ormoc, the direction of the typhoon was West by South.

Although the depth of the typhoon was not very great, yet much damage was done to several towns, specially to those on the north side of the track owing to the considerable force obtained by the northerly winds prevailing during this part of the year. Thousands of people were homeless after the storm, particularly in the Province of Iloilo.