29.26 inches, was recorded on the 26th, being 0.86 inch below the normal for that date. At Midway Island pressure was below normal during the first week by a daily average of 0.08 inch and above normal thereafter, except on the 19th, by an average of 0.07 inch. At Honolulu pressure was very generally below normal during the first half of the month and above during the last half, the departures as a rule being small.

The month opened with a typhoon forming in the region to the eastward of the Philippines. On the 4th this typhoon passed a few miles to the north of Manila, thence across the China Sea and the Gulf of Tongking, entering Tongking on the 7th.[1]

The opening days of the month also witnessed a northwesterly gale off the California coast of the United States, due to the southeastward movement of the high pressure area noted at Dutch Harbor on the 4th and 5th. Reports of this gale from vessels that were involved are as follows:

British S. S. *Ben Venue*, Capt. C. Marsh, Observer D. McGiep, Portland (June 30) for Panama.

Gale began on the 1st, wind N. by W.; lowest barometer 29.87 inches at 5 a. m. of 2d in latitude 37° 53′ N., longitude 123° 53′ W., wind NNW., 9; end of gale on 2d, wind NNE.; highest force 10, NNW.; shifts, N. to WNW.

American S. S. *Stockton*, Capt. S. Rustad, Observer G. Flyeum, Los Angeles (June 30) for Honolulu.

Moderate gale from NNW. set in at 8 p. m., June 30, hauling to N. by noon of July 1 and continuing for next 20 hours; wind then hauled to NE., force 7–8; a large sea, shifting with the change of wind, was running and vessel shipped the heaviest seas recorded in 10 months' service across the Pacific. Barometer at noon (G. M. T.) on 30th, 29.77 inches, noon of 1st, 29.94 inches. Position on latter date, latitude 32° 47′ N., longitude 124° 40′ W.

American Bark *Moshula*, Capt F. O. Parker, Newcastle (Australia), via Manila, for San Francisco.

July 1, latitude 38° 25′ N., longitude 130° 24′ W., hard gale set in from N. and continued until the 3d; on the 2d reached force 11, NNW., with a heavy sea; on 3d split foresail; position on 3d, latitude 33°.34′ N., longitude 128° 05′ W. Barometer remained high during gale.

The American Army transport *Buford*, Capt. L. R. M. Kerr, Observer Oscar A. Littchen, Honolulu for San Francisco, was involved in this gale from the afternoon of the 1st to the morning of the 3d. The wind reached force 8, from the NW. Postition at noon (G. M. T.) on 2d, latitude 36° 46′ N., longitude 125° 53′ W.

From the 9th to the 11th the U. S. revenue cutter *Bear*, Capt. C. S. Cochran, Observer R. T. McElligott, experienced a southeasterly gale while cruising in Alaskan waters. Following is the report from the *Bear:*

Gale began on the 9th, wind SE.; lowest baromater 29.70 inches at 6 p. m., same date, in latitude 65° 57′ N., longitude 170° 06′ W. end of gale on the 11th; highest force of wind, 9, SE.; shifts, 4 points.

On the 21st and 22d (Asiatic time) the Japanese S. S. *Korea Maru*, Capt. M. Jin, Observer H. Shimmura, Yokohama for Honolulu, had a moderate to fresh easterly gale. This was near latitude 30° N., longitude 177° E.–177° W. Highest force of wind 8, ESE.; lowest barometer 29.87 inches, at 4 p. m. of the 21st, in latitude 30° 20′ N., longitude 179° 20′ E.

On the 14th a second typhoon formed in the region between the Philippine Islands and Ladrone Islands, whence it moved in a northwesterly direction through the Balintang Channel, the China Sea, and the northern part of the Gulf of Tongking.

An unusual amount of fog was reported during the month by vessels on the northern steamship routes.

TWO TYPHOONS OVER THE PHILIPPINES, JULY 4 AND 22, 1921.

551.515 (914)

By José Coronas, S. J., Chief, Meteorological Division.

[Weather Bureau, Manila, P. I., July 30, 1921.]

Two well-developed typhoons have visited the Philippine Islands during this month of July—one near Manila on July 4, and the other through the Balintang Channel near the Batan and Babuyan Islands on July 22.

Typhoon of July 4.—This typhoon was hardly shown by the observations of Guam and Yap. It is only with very slight probability, based on the winds prevailing at Yap in July 1, that we may suppose that the typhoon was formed on that day between 14° and 15° latitude N. and in about 132° or 133° longitude E. It seems, however, certain that it did not form east of the meridian 135°, but rather to the west of same. In other words this typhoon belongs to the type of those that form nearer to the Philippines than to the Ladrone Islands. As the extent of the typhoon was rather small, its existence could not be noticed in our weather maps until the morning of July 3, when the first warnings were issued by Manila Observatory. The approximate position of the center at 6 a. m. of the 3d was 126° longitude E. and 14° 30′ latitude N.

The center of the typhoon passed a few miles to the north of Manila moving almost due west at 1:45 p. m. of July 4, when the barometric minimum 745.50 mm. (29.35 inches) was recorded. A gale from NW. backing to SW. and S. blew for about six hours (from 11 a. m. to 5 p. m.) doing considerable damage to the city. The highest velocities of the wind recorded in the most violent gusts were 75 miles per hour at 1:28 p. m., and 63 miles per hour at 1:53 p. m. No vortical calm was observed in Manila, but relative calm lasting from 20 minutes to 1 hour was reported from practically all the towns situated from 5 to 25 miles north of Manila. The greatest damage of the storm was done to the Provinces of Rizal, Bulacan, Pampanga, and Bataan. The center traversed Tayabas Province near Polillo and Infanta, the northern part of Rizal Province, the southern part of Bulacan, Pampanga, and Zambales Provinces, and the northern part of Bataan Province. The rate of progress of the typhoon while crossing the Philippines was 8 miles per hour.

In the China Sea, the typhoon increased its rate of progress and inclined northwestward, thus crossing the Paracel Islands in the morning of the 6th, and traversing the Gulf of Tongking and entering Tongking on the 7th.

Typhoon of the "Naugus:" July 22.—We call this the typhoon of *"Naugus"* because this steamer was almost caught in its center in the China Sea, July 23, with a barometric minimum as low as 715 mm. (28.15 inches). The position of the *"Naugus"* at noon of the 22d was 21° 30′ latitude N. and 118° 54′ longitude E., and at noon of the 23d, 18° 59′ latitude N. and 116° 44′ longitude E. The barometric minimum was observed at 8 a. m. of the 23d. The steamer was on her way from Dairen to Batavia; all the superstructure, life boats, and ventilators were damaged, but the hull and the machinery remained intact.

The steamer *"Loong Sang,"* on her way from Hongkong to Manila, felt also the fury of the storm in the China Sea, the barometer having fallen to 735.57 mm. (28.96 inches) at 4 p. m. of the 23d.

[1] See article below regarding typhoons of July, 1921, by Rev. José Coronas, S. J.