

paulins on No. 2, 5, 6, and 7 hatches burst open and in some cases blew away, thus allowing the sea water to find itself into the ship. \* \* \* we were on our course for Los Angeles at 9:25 a. m.

The barometer from which the reading of 27.40 inches was taken was carefully tested for temperature and pressure by the Weather Bureau office at San Francisco late in January 1940, and the result indicated that the minimum reading of 27.40 was .05 too low. In accepting 27.45 inches (929.6 millibars) as the correct figure, it remains outstanding as the lowest barometer reading on record in connection with a tropical cyclone occurring in southeastern North Pacific tropical waters.

NOTE.—A report received from the master of the *Nevadan* since the preparation of the foregoing text gives 20° N., 106°21' W., as the approximate position of the ship at time of lowest barometer.

#### THE APPROACH OF A GULF OF MEXICO NORTHER JANUARY 19, 1940

By WILLIS E. HURD

During the 19th of January 1940, a strong anticyclone, central over Texas, descended rapidly over the Gulf of Mexico, accompanied by subfreezing temperatures along the Texas coast and strong norther winds over the western and central Gulf.

At local noon of the 19th the American steamer *Antinous*, Colon toward New Orleans, was in latitude 21°44' N., longitude 86°14' W., with a northwest wind of force 1, barometer 1,015.9 millibars (30 inches), air temperature 82°, sea temperature 80°, weather fine and clear with a few scattered cumulus clouds, and smooth sea. D. Bolhuis, Second Officer on ship—Capt. C. Reed, Master—sent the Weather Bureau an interesting special report on the meteorological conditions attending the burst of the norther over the southeastern Gulf during the afternoon of the 19th and of its continuance during the forenoon of the 20th. Said Mr. Bolhuis:

At 3 p. m. (C. S. T.) dark clouds were observed on the northern horizon to east and west. By 3:15 p. m. they were advancing rapidly and heavy rain was observed. At 3:25 p. m. the norther struck the vessel, with wind from the northwest, force 5, and very heavy rain squalls; barometer steady at 29.97 inches (1,014.9 millibars); temperature of air 76° and sea at injection, 80°. Vessel steering from noon toward the north-northwest (true) at 13 knots. Heavy rains and steady northwest wind, force 5, continued until 8 p. m., then veering to north-northwest to north, force 6. Overcast with heavy rains, and short, choppy, rough sea and swell. At midnight the sky was overcast, with barometer rising steadily and reading 30.12; temperature of air 66° and of sea at injection 78°.

January 20, midnight till noon: Wind north, force 6, decreasing to force 5 at noon. Very little rain and barometer rising steadily to 30.2 inches (1,022.7 millibars). Noon position by dead reckoning, latitude 25°49' N., longitude 87°50' W.; temperature of air 55° and of sea at injection, 78°.

The sea seemed to be at its choppiest and roughest in latitude 23°21' N., longitude 87°03' W., near the 100-fathom curve off the northern coast of Yucatan.

#### LATE REPORT

#### TYPHOONS AND DEPRESSIONS OVER THE FAR EAST, DECEMBER 1939

BERNARD F. DOUCETTE, S. J.

[Weather Bureau, Manila, P. I.]

*Typhoon. November 29–December 5, 1939.*—This typhoon first appeared about 150 miles south of Yap, apparently well developed, indicating that it most likely formed far to the east of that locality some time previously. From its position south of Yap it moved along a west-

northwesterly course, gradually inclining to the north-west. It crossed Samar passing over the southern and central portions on December 2. It continued along this northwesterly course, the center fortunately moving over the water instead of over the islands, for example avoiding Masbate Island and Sorsogon Province. The center moved along the length of Ragay Gulf and crossed Camarines Norte as it inclined to the north, all the time decreasing in intensity and moving slowly. After December 5 it recurved to the northeast as a weak disturbance which soon disappeared over the ocean east of Luzon.

The newspapers of December 9 reported that the total loss of life due to this typhoon, according to reports received, was 34, all from Masbate Island where the rivers rose suddenly because of the heavy rains. There was great property damage along the course of the center, all due to floods and wind.

The barometric minima received from the stations of Samar, Masbate, and southern Luzon show that the storm was weakening as it progressed over the Archipelago. Borongan, Samar, had 730.50 millimeters (974.9 millibars) as its lowest pressure at 2 p. m. December 2, with southeast winds of force 4. Guian, Samar, reported 737.94 millimeters (983.8 millibars) with south winds force 9 at 11 a. m. of the same day. Late in the afternoon of December 2, the center passed between Catbalogan and Calbayog, Samar Island. The minima experienced at these stations were 732.91 millimeters (977.1 millibars) for Catbalogan and 731.64 millimeters (975.4 millibars) for Calbayog. Masbate had 731.65 millimeters (975.5 millibars) as its minimum, with winds from the northwest, force 1, during the morning hours of December 3. At Atimonan, Tayabas Pr., 744.03 millimeters (991.9 millibars) was reported as the minimum, with winds of force 7 from the north-northeast, December 4, at 4 a. m. At almost all of these stations, winds of force 10 to 12 were reported as the storm moved past the locality.

On the days preceding November 29, the upper winds over Guam showed the presence of a rather strong east quadrant current, backing from east-southeast to east-northeast, and with velocities as high as 50 kilometers per hour (Nov. 27). Most of these ascents were short and they do not give a very complete picture of the activity aloft. But after November 28 a strong east-southeast and southeast current set in, with velocities as high as 80 kilometers per hour. The Netherland East Indies stations showed the presence of an extensive southwesterly and westerly current of air flowing toward the typhoon center. Menado was an excellent station for showing that the typhoon was intense. Although the reports were not received every day, yet there were enough to show the presence of a western and southwest quadrant current (depending upon the altitude) over the station, with velocities of 50 kilometers per hour and over at many levels. During these days, as the center approached the Philippines, Zamboanga did not have any definite southwesterly current until after December 1, when the pilots first indicated the approach of air from equatorial regions. After December 2, both Zamboanga and Cebu were in the southwest sector of the storm, with only a few short ascents being made. Manila and the stations of northern Luzon, however had north quadrant winds, strong and persistent. There were some ascents that showed velocities to be 100 kilometers per hour and over, while the usual values reported were between 50 and 80 kilometers per hour. There