TABLE 1.—*Averages, departures, and extremes of atmospheric pressure at sea level at indicated hours, North Pacific Ocean and adjacent waters, December, 1929*

| Stations | Average pressure | Departure from normal | Highest | Date | Lowest | Date |
|---|---|---|---|---|---|---|
| | *Inches* | *Inch* | *Inches* | | *Inches* | |
| Point Barrow [1] [2] | 30.00 | | 30.62 | 19th | 29.20 | 28th. |
| Dutch Harbor [1] | 29.75 | +0.17 | 30.36 | 5th | 28.76 | 27th. |
| St. Paul [1] | 29.75 | +0.14 | 30.44 | 5th | 29.04 | 24th.[3] |
| Kodiak [1] | 29.75 | +0.17 | 30.42 | 6th | 28.82 | 28th. |
| Midway Island [1] [4] | 30.11 | +0.07 | 30.34 | 1st [3] | 29.88 | 5th. |
| Honolulu [5] | 29.94 | −0.08 | 30.07 | 6th | 29.74 | 15th. |
| Juneau [5] | 29.89 | +0.10 | 30.35 | 17th | 29.06 | 26th. |
| Tatoosh Island [5] [6] | 29.97 | 0.00 | 30.44 | 27th | 29.29 | 10th. |
| San Francisco [5] [6] | 30.12 | +0.01 | 30.34 | 21st | 29.84 | 11th. |
| San Diego [5] [6] | 30.04 | 0.00 | 30.29 | 21st | 29.76 | 19th. |

[1] P. m. observations only.
[2] For 28 days.
[3] And on other dates.
[4] For 30 days.
[5] A. m. and p. m. observations.
[6] Corrected to 24-hour mean.

December as a whole was a somewhat stormier month than November over most of the upper half of the ocean, although the number of the more violent gales was less. High winds this month were more widespread as to area and days of occurrence and were reported from some locality or other on every day except the 12th. The greatest number of days with gales reported from any 5° square was 8, occurring east of Japan. Data at hand show that steamships encountered full storm to hurricane velocities on four days; on the 4th, in the lower part of the Bering Sea and also a few hundred miles northwest of Midway Island; on the 20th, south of the western Aleutians; and on the 21st and 25th, east of northern Japan. In November there were seven days with wind forces of 11 to 12 on the ocean, latest reports for the month showing that violent gales, not mentioned in the previous review of North Pacific weather, occurred east and northeast of Japan on the 23d, 24th, and 27th.

During the current month wind forces of 8 to 10 were common along the whole length of the northern and much of the middle routes. From the 2d to the 6th a cyclone that prevailed between the Hawaiian Islands and California occasioned much rough weather, with fresh to whole gales, and anticyclonic gales occurred in the same region on the 30th and 31st. On the 13th, 14th, 22d, 24th, and 25th gales were encountered along the Washington, Oregon, and northern California coasts. The maximum wind velocity at Tatoosh Island was at the rate of 57 miles an hour—force 10—from the east on the 13th.

To the westward of the coast region as far as the one hundred and eightieth meridian, north of the parallel of 40°, while frequent gales blew early in the month, the greatest number occurred in the last decade during the days when the Aleutian cyclone was most active. West of the central meridian the frequent gales were due largely to the presence of a fairly permanent cyclonic area—the westernmost extension of the Aleutian Low—south of Kamchatka, and to the activity of a number of cyclones which entered the ocean from Asia. Off the coast of China gales, usually of moderate force but sometimes becoming fresh, were of the northeast monsoon type. These were apparently of greatest severity on the 3d and 4th, when a powerful anticyclone pushed upon the China and Eastern Seas.

The Gulf of Tehuantepec was the scene this month of frequent strong northers. Gales were reported by seamen as occurring here on at least 12 days, on four of which, the 3d, 19th, 22d, and 23d, they attained to whole gale force. Several of these blew over a wide area of sea to the southward, but ceased rather abruptly to the westward of the gulf, as witness the instance of the British motorship *Loch Goil*, which, in lat. 16° N., long. 99° W., on the 19th was experiencing calms and light airs, while a violent Tehuantepecer was blowing south of the isthmus. At Salina Cruz maximum wind velocities from the north, in miles per hour, occurred as follows: On the 3d, 64 miles; 4th and 26th, 56 miles; 29th, 60 miles, these constituting whole gales to storm winds at the head of the bay.

The prevailing wind direction at Honolulu was northeast, whereas in December it is usually east, and the maximum wind velocity was at the rate of 28 miles an hour from the northeast on the 30th.

Over the northwestern part of the ocean scattered fog showed an increase from two days of occurrence in November to five days in December. It was most widespread in area on the 9th, 10th, and 19th. Occasional fog was met with thence eastward to American waters. Along the American coast it was reported on seven days in the vicinity of Puget Sound, on 13 days outside of San Francisco Harbor, and on eight days outside of San Diego. It decreased southward, but occurred on the 11th and 12th in the Gulf of Tehuantepec. Here the American steamship *Corinto* encountered it with a west-southwesterly wind, immediately following a strong norther from west-northwest on the 11th.

## TYPHOONS AND DEPRESSIONS IN NOVEMBER, 1929

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*One Philippine and China Sea typhoon and one Pacific typhoon.*—There were only two well-developed typhoons noticed over the Far East during the month of November, one of them having traversed the Philippines through the Visayan Islands and the Sulu Sea on the 10th and 11th.

This Philippine typhoon was probably formed on the 8th in very low latitude to the southwest of Pelew Islands near 132° longitude E. and 5° latitude N. It moved northwestward on the 8th and inclined to WNW. on the 9th, reaching the Philippines near to the north of Surigao during the night of the 9th to 10th. In the morning of the 10th it moved NNW. for a few hours, and then it took a westward direction in the afternoon of the same day. This west direction was kept until the 12th when it began to move again to WNW. in the China Sea.

While traversing the Visayan Islands, this typhoon appeared to be only a shallow depression of little importance; but it began to develop more in the Sulu Sea and became a much developed and severe typhoon in the China Sea. The steamer *Calchas* passed through its center at 3:30 p. m. of November 14 in 112° 07′ longitude E. and 13° 57′ latitude N. The barometric minimum recorded at that time was as low as 28.38 inches (720.84 mm.), the winds blowing from ENE. force 9 before the minimum and from SW. force 9 to 10 after the minimum. The captain of the steamer describes thus the passing of the center:

> In the central area, we noticed many land birds including a wild duck. The sun shone clearly for a period of about 20 minutes. The wind was light and variable, and the sea was very rough and confused (pyramidal).

The approximate positions of the center at 6 a. m. of November 8 to 15 were as follows:

November 8, 6 a. m., 132° 15′ longitude E. 5° 25′ latitude N.
November 9, 6 a. m., 129° 45′ longitude E., 7° 45′ latitude N.
November 10, 6 a. m., 124° 25′ longitude E., 10° 30′ latitude N.