

TABLE 1.—Averages, departures, and extremes of atmospheric pressure at sea level, North Pacific Ocean, July 1936, at selected stations

Stations	Average pressure	Departure from normal	Highest	Date	Lowest	Date
	<i>Inches</i>	<i>Inch</i>	<i>Inches</i>		<i>Inches</i>	
Point Barrow	29.72	-0.20	30.28	27	29.12	9
Dutch Harbor	30.09	+ .15	30.36	18	29.34	1
St. Paul	30.06	+ .22	30.44	20	29.40	5
Kodiak	29.93	- .01	30.22	18	29.48	9
Juneau	29.93	- .12	30.24	31	29.42	9
Tatoosh Island	30.04	- .01	30.23	29	29.68	4
San Francisco	29.59	- .06	30.00	11	29.74	14
Mazatlan	29.53	- .03	29.92	29	29.66	14
Honolulu	30.02	.00	30.12	31	29.92	15
Midway Island	30.10	- .01	30.20	23	29.98	13, 14
Guam	29.83	- .01	29.94	6	29.74	13, 16
Manila	29.74	.00	29.88	8	29.62	17, 29
Hong Kong ¹						
Naha	29.76	+ .04	29.96	7	29.52	20, 21
Chichishima	29.91	+ .06	30.04	16, 17	29.56	10
Urakawa	29.78		30.20	6	29.42	11

¹ Data missing.

NOTE.—Data based on 1 daily observation only, except those for Juneau, Tatoosh Island, San Francisco, and Honolulu, which are based on 2 observations. Departures are computed from best available normals related to time of observation.

Cyclones and gales.—North Pacific weather in higher latitudes was for the most part quiet in July 1936. A few extratropical disturbances occurred; but only a small number was reported as causing winds of gale intensity, and these on only 5 days. The American steamship *Washington* was the only vessel to report a gale in excess of force 8. This was of force 9, encountered during the night of the 5th–6th, lowest barometer 29.93, in the neighborhood of 52° N., 153° W.

Tropical disturbances.—Subjoined is a report, by the Reverend Bernard F. Doucette, S. J., of the Philippine Weather Bureau, on five typhoons and one depression that occurred in the Far East during July 1936.

There is little to add to this account beyond a mention, in connection with the typhoon of July 16–25, of the fact that two vessels, the British motorships *Laganbank* and *Silveryew*, reported encountering gales of force 8 on the 19th within the neighborhood 15°–16° N., 128°–132° E.

Fog.—Along the northern steamship routes fog was frequent to the westward of the one hundred and sixtieth meridian of west longitude, the occurrence increasing from about 20 percent in the eastern area to about 70 percent in the neighborhood of northern Japan. As an illustration of the persistence of fog in the trans-Pacific travel of the month: The American S. S. *President Jefferson* entered fog at 3 p. m. of the 15th, in 38°13' N., 145°43' E., and did not leave it until 4 p. m. of the 18th in 47°30' N., 171°36' E. There were 13 days with fog reported off the California coast; and 9 days off the coast of Lower California.

TYPHOONS AND DEPRESSION OVER THE FAR EAST, JULY 1936

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Five typhoons and one depression occurred during the month of July 1936 over the Philippines and adjoining regions.

Typhoon, July 1 to 5, 1936.—A typhoon appeared the morning of July 1 about 400 miles east of southern Samar and moved west-northwest toward northern Luzon, which was in danger until the forenoon of July 3. The storm then shifted to the north, afterward northwest, and moved rapidly across the Balintang Channel. It entered the continent close to Swatow the morning of July 5 and soon changed its course to the east. By this time it had

weakened considerably and on the following morning had disappeared. The typhoon was small and the winds were not violent over northern Luzon, July 3, consequently little damage resulted.

Typhoon, July 5–10, 1936.—From July 2 to 4, pressure was low over the Eastern and Western Caroline Islands; but no definite center appeared until July 5, when the morning weather map showed the existence of a depression about 200 miles north-northeast of Yap. During the next 2 days the depression moved west-northwest quite rapidly, intensifying as it progressed. The morning of July 8 found it about 300 miles east-northeast of Manila moving west-northwest. It passed north of and close to Tuguegarao, Cagayan Province, the afternoon of the same day. The next morning, the typhoon was over the northern part of the China Sea, much decreased in intensity, and moving northward toward the Continent, which it entered July 10.

The location of the typhoon on the morning of July 8 was known from observations sent to the Observatory by Captain Weber of the S. S. *Barentsz*. His ship encountered the typhoon winds and rain and passed through the center (9:20 to 9:30 a. m., position at 9 a. m. lat. 16.32 long. 123.44) with a barometric minimum of 727.7 mm (28.650 in.). The pressure had fallen from 750.0 mm (29.528 in.) to this value in about 1 hour (8.25 a. m. to 9:20 a. m.) and regained the higher value at 10:30 a. m. The winds were of hurricane force but there was no warning swell in advance of the typhoon. The evidence obtained by the officers of the ship plainly indicates that the typhoon was very small, with the destructive winds extending only over a small area. At Tuguegarao, Cagayan Province, a barometric minimum of 742.46 mm (29.270 in.) was observed July 8, 5:16 p. m.

Two people were crushed by falling trees near Tuguegarao. The M. S. *Marie* was lost 8 or 10 miles south of Palinan along the eastern coast of Luzon. (Palinan Point is in lat. 17.10 N, long. 122.27 E). The crew, reported to be 26 in number, and 2 passengers were lost with the ship, according to newspaper reports, July 22.

Typhoon, July 16 to 25, 1936.—A depression appeared, July 16, about 200 miles west-northwest of Yap, moved west-northwest, gradually inclining to the north, passing over 300 miles east of the Philippines. When east of Formosa (July 21), it intensified and was a severe disturbance as it crossed the Loo Choos (Nansei) Islands about 50 miles west of Naha. It gradually recurved to the northeast, passing close to Kiushu Island on its way to and across the Sea of Japan. Thence it moved rapidly across northern Japan toward the Aleutian Islands. The newspapers of July 24 reported 4 deaths in Japan, many fishing boats lost, and certain districts flooded, with greatest damage at Kagoshima. The navy service ship, *Mamiya*, and the submarine *S-55* were beached near Sasebo, with some damage.

Typhoon, July 18 to 21, 1936.—A depression appeared about 300 miles west by south of Manila on July 18 and moved slowly in a northwesterly direction. On the 19th and 20th it intensified into a typhoon, which continued toward Hainan Island, but changed to the west when close to and south of the island. It entered Indochina, moving westerly, and gradually decreased in intensity.

It is to be noted that this typhoon, west of the Archipelago, and the preceding typhoon, east of the Archipelago, were phenomena along the front extending from Indochina to the Caroline Islands. Both of these typhoons intensified within a day of each other, the one in the China Sea on the 19th, the Pacific disturbance on the 20th. Observations received from the S. S. *Kota Agoeng*

and the S. S. *Tjimanook* showed the existence and position of this front east of the Archipelago, about latitude 13° N, on July 14 to 16, and on July 19, respectively. This intensification, in the opinion of the writer, was due to an increase of velocity of the easterly current of air, north of the front.

Typhoon, July 22 to August 3, 1936.—Forming between Yap and Palau Islands, a depression appeared July 24 and moved in a west-northwest direction. It was practically stationary July 27 and 28 about 300 miles east of San Bernardino Strait. About 10 a. m. on the latter day, it began to move in a northwest direction, developing as it moved. As it approached northern Luzon, it was a typhoon moving quite rapidly, and during the night of July 29 it crossed the Island between Aparri and Tuguegarao, inclining to the west-northwest. The next morning found it about 60 miles west of Laoag, Ilocos Norte, and very intense. From this position, it moved a short distance to the west-northwest and then inclined to the northwest and finally north, entering the continent close to Swatow. On August 3, the storm was located southwest of Shanghai, of considerable intensity, and moving in a northeast direction.

As the typhoon crossed northern Luzon, there were no high-velocity winds nor very low barometric minima. In

the early morning hours of July 31 there seemed to be a secondary disturbance south of Vigan, Ilocos Sur, which caused easterly winds and heavy rains. This did not last very long, because of the very great intensity of the typhoon as it entered the China Sea. The S. S. *Empress of Russia*, enroute Hong Kong to Manila, passed through the center, reporting "July 31, 0230 G. M. T. lat. 18.45 N, long. 116.52 E. Now passing center typhoon, winds calm, 28.65 mer. cor." The next day, at 6 a. m. Pratas Island reported "variable winds, force 2, overcast 714.73 mm" (28.143 in.). Many ships around the typhoon, both north and south, reported winds of hurricane force while the storm was moving northward toward the continent.

Newspapers at Manila on August 1 reported a loss of life totaling seven, with possibility of more being reported later. The heavy rains in the mountains along the western coast of Luzon caused disaster along the river banks in the lowlands as the torrents rushed down the slopes to the sea. No reports have been received to date (Aug. 3) from China.

Depression, July 26 to August 3, 1936.—A depression of minor importance formed over the Western Caroline Islands, moved west-northwest and filled up over 300 miles east of northern Luzon.