

Mr. Griffiths. The readings employed in constructing the curve have not been corrected for instrumental error, which, according to comparisons made at the end of the voyage, is  $-0.15$  inch.

The *Empress of Asia* was also heavily involved in the storm and recorded the lowest barometer in the group of four vessels named, 27.39 inches, corrected. This vessel, under command of Capt. L. D. Douglas, R. N. R., Observer J. F. Patrick, was bound from Vancouver to Yokohama. Her storm log is given herewith, as well as a reproduction of the barograph trace obtained, figure 2.

October 20. Noon position, latitude  $49^{\circ} 51' N.$ , longitude  $174^{\circ} 09' E.$ , barometer 29.81 inches, wind S., force 5, backing to ESE. at 1 p. m. and increasing in force. 4 p. m., barometer 29.29, temperature  $48^{\circ}$ , wind force 7, raining. 8 p. m., latitude  $49^{\circ} 05' N.$ , longitude  $170^{\circ} 34' E.$ , barometer 28.78, wind increasing to strong ESE, gale with high seas and continuous rain. 10 p. m., wind force 10, barometer 28.13, falling rapidly. Midnight, wind decreasing and backing to NE., barometer 27.53, temperature  $50^{\circ}$ .

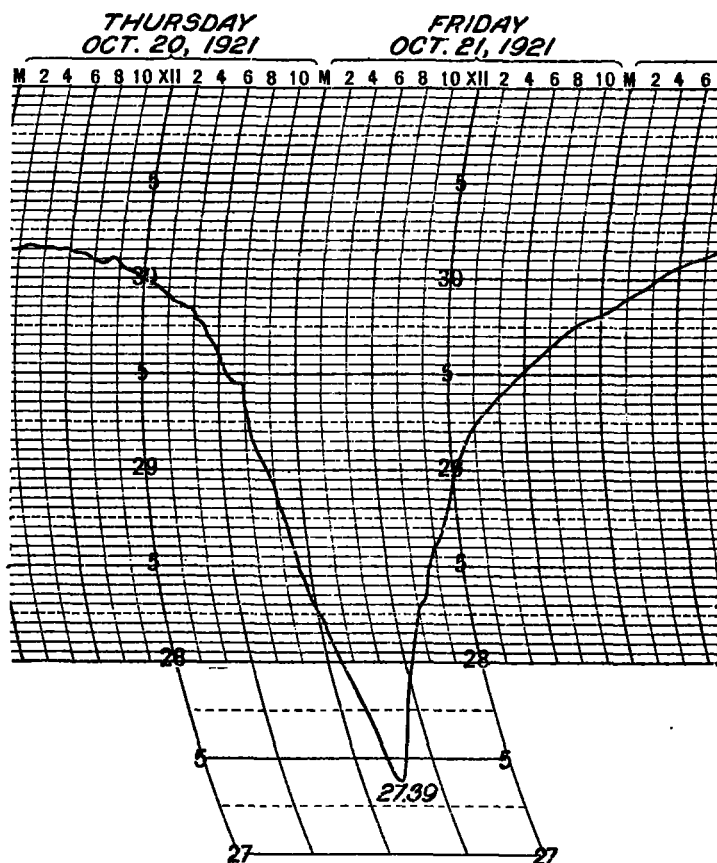


FIG. 2.—Barograph trace, October 20-21, 1921, British S. S. *Empress of Asia*.

October 21. 1 a. m., latitude  $48^{\circ} 33' N.$ , longitude  $168^{\circ} 03' E.$ , light variable winds with high SE. swell, barometer 27.48 (correction  $-0.09$  inch). 1:15 a. m., wind changed to NW., force 6, with high, confused sea. 2 a. m., barometer 27.50. 3 a. m., barometer 27.66, wind increasing to force 10, mountainous seas. Reduced speed, wind and sea brought 3 points on starboard bow. 4 a. m., latitude  $48^{\circ} 14' N.$ , longitude  $166^{\circ} 33' E.$ , wind increasing to hurricane force with very high, confused sea, barometer 27.91. 5 to 7 a. m., terrific squalls and high drift, being unable to see more than a ship's length, seas phenomenal. 8 a. m., latitude  $48^{\circ} 12' N.$ , longitude  $165^{\circ} 52' E.$ , barometer 28.60, patches of blue sky appearing. 8 to 11 a. m., wind continuing to force 12 with heavy hail squalls. Noon, latitude  $48^{\circ} 08' N.$ , longitude  $165^{\circ} 15' E.$ , weather moderating slightly to force 7 at midnight. Position at midnight, latitude  $46^{\circ} 58' N.$ , longitude  $162^{\circ} 01' E.$

This storm possessed at a high latitude the pressure characteristics of a tropical cyclone, in this respect resembling the West Indian hurricane of September 7-18, 1921, in the North Atlantic Ocean. It continued

its northeasterly movement to Bering Sea where, on the evening of the 21st, a barometer reading of 28.66 inches was recorded at St. Pauls, Pribilof-Islands. On the following day it was central over the Alaskan Peninsula, very much diminished in energy.

Aside from the four storms mentioned no other disturbance of a general character prevailed during the month, so far as known. One of moderate extent and intensity, however, developed on the 9th off the southwest Mexican coast. It was experienced by the British S. S. *Mongolian Prince*, Capt. J. Halloway, Observer J. McLoughlin, Vancouver for Panama. The storm log of this vessel is as follows:

Gale began on the 9th, wind ESE.; heavy southerly swell; lowest barometer, 29.68 inches, occurred at 4 a. m., same date, in latitude  $17^{\circ} 15' N.$ , longitude  $101^{\circ} 51' W.$ ; gale ended on 10th; highest force of wind, 7, SE.; shifts ESE.-SE.

Pressure conditions at the island stations of Dutch Harbor, Honolulu, and Midway Island were not marked by any unusual fluctuations. For the month as a whole pressure was below normal by small amounts at all three stations.

#### NO TYPHOON IN THE PHILIPPINES DURING OCTOBER, 1921. ONLY THREE IN THE PACIFIC.

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[Weather Bureau, Manila, P. I., Nov. 4, 1921.]

There was not a single typhoon traversing the Philippines during last October; and even of the three typhoons that have been observed in the Pacific only one approached sufficiently near to influence slightly our weather in the archipelago. Hence the lack of rain reported generally from our stations, especially from those of the western and northern part of Luzon as can be seen in the following table:

Rainfall data for October, 1921.

Station.	Total.	Departure from normal.
	mm.	mm.
Surigao.....	231.3	- 16.4
Cebu.....	146.3	- 60.2
Hollo.....	146.4	-114.0
Legaspi.....	258.7	- 68.8
Batangas.....	110.3	- 37.6
Manila.....	37.4	-151.0
San Isidro.....	122.7	- 36.4
Iba.....	104.9	- 68.6
Ipagupan.....	97.0	- 99.8
Baguio.....	115.6	-271.5
San Fernando, La Union.....	2.0	-142.8
Vigan.....	2.5	-182.6
Tuguegarao.....	24.6	-227.5
Laong.....	4.6	-215.9
Aparri.....	190.8	-107.1

The first Pacific typhoon was formed on 27th to 28th of September near longitude  $130^{\circ} E.$  and latitude  $10^{\circ} N.$ ; it moved practically to the north until the 30th when it recurved northeastward, probably filling up on the 2d or 3d of October near longitude  $135^{\circ} E.$  and latitude  $20^{\circ} N.$

The second typhoon formed on October 1 to 2 over the western Carolines in about longitude  $145^{\circ} E.$  and latitude  $8^{\circ} N.$  It moved northwestward, passing about halfway between Guam and Yap on the 3d. On the 6th the typhoon began to recurve northeastward near longitude  $135^{\circ} E.$  and latitude  $20^{\circ} N.$  The weather maps of Tokyo show this typhoon moving north-northeast near the eastern coast of Japan on the 10th and 11th.