

NORTH PACIFIC OCEAN

By WILLIS EDWIN HURD

A chart showing the average positions of the cyclones and anticyclones over the North Pacific Ocean during December, 1925, reveals some abnormal as well as normal features. There was the usual high pressure area over the China coast and adjacent seas, and comparatively low pressure over central and northern Japan and thence for some distance seaward. Off the coast of middle California the North Pacific HIGH averaged normal, but to the westward somewhat below normal; it did not cover as great an area between the Hawaiian Islands and the mainland as usual, due to active cyclones from the west and north spreading farther eastward and southward than is ordinarily the case. At Honolulu the pressure was 0.07 inch below normal, while at Midway Island it reached 0.21 inch below. From this general region of low pressure, extending north-northeastward, lay a deepening cyclonic trough culminating in a LOW, deeper than usual for December, and central over the northwestern part of the Gulf of Alaska, near Kodiak. West of this region there was no secondary depression of the Aleutian cyclone this month, pressure being normal at Dutch Harbor and becoming considerably above normal to the westward and northward, particularly toward the Pribilof Islands. Between St. Paul and Kodiak the mean pressure difference was 0.31 inch, the former averaging 0.18 inch above normal; the latter, 0.13 inch below. Normally the difference is only 0.03.

The table herewith shows the pressures, and their differences from the average, for the several island and coast stations.

TABLE 1.—Averages, departures, and extremes of atmospheric pressures at sea level at indicated hours, North Pacific Ocean, December, 1925

Station	Average pressure	Departure from normal	Highest	Date	Lowest	Date
	<i>Inches</i>	<i>Inch</i>	<i>Inches</i>		<i>Inches</i>	
Dutch Harbor <sup>1</sup> .....	29.58	0.00	30.28	17th.....	28.96	28th.
Saint Paul <sup>1</sup> .....	29.79	+0.18	30.50	.....do <sup>1</sup> .....	29.14	21st.
Kodiak <sup>1</sup> .....	29.45	-0.13	29.98	12th.....	28.98	14th.
Midway Island <sup>1,2</sup> .....	29.83	-0.21	30.14	30th.....	29.32	16th.
Honolulu <sup>3</sup> .....	29.94	-0.07	30.06	9th.....	29.64	19th.
Juneau <sup>1</sup> .....	29.69	-0.10	30.23	26th.....	29.06	1st.
Tatoosh Island <sup>1,4</sup> .....	30.03	+0.06	30.39	5th.....	29.35	17th.
San Francisco <sup>1,4</sup> .....	30.11	0.00	30.37	4th.....	29.74	1st.
San Diego <sup>1,4</sup> .....	30.01	-0.03	30.23	.....do.....	29.81	2d.

<sup>1</sup> P. m. observations only.  
<sup>2</sup> 30 days.  
<sup>3</sup> A. m. and p. m. observations.  
<sup>4</sup> Corrected to 24-hour mean.  
<sup>5</sup> Also on 18th.

During more than 20 days the weather of Midway Island and vicinity was affected by cyclones, the first of which was experienced at the beginning of the month. There was considerable wind activity on several days; the highest velocity reported was force 9, NW., on the 21st. The American cable steamer *Dickenson*, lying off Midway during a great part of December, reported gales and much drizzly weather from the 10th to the 22d. On the 18th large hail stones, mingled with excessive rain, fell during a terrific squall. Though the center of the cyclone affecting the island on these dates had moved well toward the Aleutians by the end of the month, it continued to influence the weather at Midway until the 29th.

Between the Hawaiian Islands and our west coast there were several days of rough weather, due partly to the southward spread of the cyclone central over the Gulf of

Alaska, and partly to the eastward extension of the great cyclone just mentioned. Strong gales were experienced east and northeast of Hawaii from the 19th to the 22d, and strong to whole gales near the middle of the San Francisco-Hawaii route on several days between the 17th and the 26th—being most widespread on the 25th and 26th.

At Honolulu southwest (kona) winds occurred from the 18th to the 22d, and a heavy kona rain, amounting to 1.40 inches, fell on the 18th. The maximum wind velocity was 37 SW. on the 21st, but velocities of 36 SW. and 35 SW. occurred on the 20th and 22d, respectively. The prevailing wind at this station continued to be, as heretofore for several months, from the east.

In the American Tropics gales were reported by vessels in the Gulf of Tehuantepec on the 23d, 24th, and 29th. The 23d and 24th the American steamer *Lancaster* encountered whole gales to storm winds from the north.

On the 11th a maximum wind velocity of 75 miles an hour from the south was recorded at Tatoosh Island, the storm center being over southeastern Alaska.

Along the northern sailing routes gales seem to have been comparatively infrequent east of the 170th meridian of west longitude. West of this meridian the weather was stormier, with more frequent gales. Between the Japanese coast and the meridian of 160° E. storm to hurricane velocities were reported on the 16th, 18th, 21st, and 22d, those of the 21st and 22d being due to a typhoon which was crossing the islands of Japan. This storm was experienced by the Swedish steamer *Hellenic*, Capt. Carl Camp, Cebu to Mororan, while in and near 40° 54' N., 141° 48' E. The quotation is from the report of the third officer, Mr. B. Peterzan:

December 21, 3 p. m.; barometer 29.85. The wind and sea moved to east and increased to a violent hurricane, with hard breaking sea.

12 midnight. Barometer 29.66 and dropping fast. The wind reached its highest velocity between 12 and 2 a. m., and was accompanied by tremendous squalls.

December 22, 2 a. m. Barometer 29.51. The wind suddenly died out. Above the ship the sky was clear and the stars shone bright. Round the eastern horizon much lightning. This calm period was about 25 minutes' duration, then the wind turned right over to west and came with the force as before. The sky overcast again.

4.50 p. m. Ship in port. Barometer still going down, and it reached the lowest point, 10 p. m., 28.66, then began to raise fast. Weather squally with snow and rain.

Concerning another typhoon in the Far East, see the following report by the Rev. José Coronas, S. J., of the Manila Observatory.

Fog was of frequent occurrence off the central California coast. It was observed on a number of days over the southern waters of the Gulf of Alaska, and occasionally south of the easternmost islands of the Aleutian chain, but no report of its occurrence west of the 180th meridian has yet been received.

TYPHOONS AND DEPRESSIONS

A TYPHOON OVER YAP IN DECEMBER, 1925

By Rev. JOSÉ CORONAS, S. J.

[Weather Bureau, Manila, P. I.]

This typhoon was shown for the first time on our weather maps on December 14 to the south of Guam, in about 145° longitude E., between 8° and 9° latitude N. It moved W. on the 14th, and passed over or very close to Yap in the afternoon or evening of the 15th. The last weather report received from that station was

that of 2 p. m. of the 15th with a barometric reading 743.8 mm. (29.28 ins.) and a strong gale from NNE. The communication with Yap was then interrupted, and up to the present no information has been received from our observer there, although news has reached us to the effect that our meteorological station was practically destroyed by the typhoon.

Observations from the U. S. A. T. *Chaumont*, on her way from Guam to the Philippines, show clearly that the typhoon recurved gradually to the N. and NE. after passing over Yap. The barometric minimum observed

on the *Chaumont* was 749.5 mm. (29.51 ins.) on the 18th, while a strong gale was blowing from the SE.

The approximate position of the center at 6 a. m. and 2 p. m. of the 17th to 20th was as follows:

December 17, 6 a. m.	132 35	longitude E.,	10 50	latitude N.
December 17, 2 p. m.	131 30	longitude E.,	11 30	latitude N.
December 18, 6 a. m.	130 35	longitude E.,	12 40	latitude N.
December 18, 2 p. m.	130 30	longitude E.,	13 00	latitude N.
December 19, 6 a. m.	130 20	longitude E.,	13 40	latitude N.
December 19, 2 p. m.	130 20	longitude E.,	13 50	latitude N.
December 20, 6 a. m.	130 40	longitude E.,	15 40	latitude N.

## DETAILS OF THE WEATHER IN THE UNITED STATES

### GENERAL CONDITIONS

The outstanding features of the pressure distribution were as follows: The continental extension of the North Pacific statistical anticyclone was centered over the Great Basin with pressure 30.30 inches or higher on 19 days; pressure in the oceanic part of this anticyclone was considerably diminished and was probably 0.20 inch below normal values. Coincidentally with decreased pressure over the ocean, continental over western United States were higher than usual. The continuity of the high pressure over the Great Basin was interrupted in the last half of the month, thus facilitating the development and movement of cyclonic storms in lower latitudes. Several such storms converged over the North Atlantic in the neighborhood of the Grand Bank where very low pressure was registered.

In the United States the single outstanding cold spell was inaugurated by the southward movement of high pressure as shown in Chart I.

The usual details follow.

### CYCLONES AND ANTICYCLONES

By W. P. DAY

The number of both low-pressure and high-pressure areas was below the normal for December. There were 13 LOWS as compared with 18 for November and 23 for October, and the 8 HIGHS were the least number occurring in any month during the year. A persistent Plateau HIGH with extensions to the southeast, continuing from the 3d to the 11th, shielded the country from the rather active Pacific LOWS; and when the Plateau HIGH finally gave way, it was succeeded by two great HIGHS from the Canadian interior which successively occupied much of the country. The second and larger of the two covered practically the entire interior of the continent from the 26th until the 31st, and of course no LOWS of importance were charted during this interval.

### FREE-AIR SUMMARY

By V. E. JAKL

The mean free-air temperatures were below normal at all aerological stations except Drexel and Ellendale, where they were approximate normal at the former station and slightly above at the latter. (See Table 1.) Observed departures aloft were, moreover, about the same as at the surface. Their geographical distribution is therefore quite well represented by the map of surface temperature departures, Chart III in this REVIEW.

The greatest negative departure was at Groesbeck, where the resultant winds (Table 2) were generally northwesterly, instead of about west-southwest, as is normal for the altitudes usually obtained there. At those

other stations where negative temperature departures were also recorded, the excess of northerly component (or lack of southerly component) as compared with the normal, was not so pronounced as at Groesbeck; in some cases, as at Royal Center, the deviation from the normal was barely perceptible.

The general wind resultants derived from both balloon and kite observations were northwesterly, varying, however, from more nearly westerly to decidedly northwesterly with increase in altitude and latitude. Westerly winds aloft were dominant in the lower latitudes as far south as Key West, where above 2,000 meters the prevailing winds were of moderate force from almost due west. At this station the winds had an easterly component up to about 1,000 meters, above which there was a transition zone of southerly winds extending to about 2,000 meters. San Francisco also showed winds with an easterly component in the lower levels, but to a slightly greater depth than at Key West. Easterly components are not apparent in the resultants from observations at any of the other stations. Resultant velocities were close to normal at all levels at practically all stations.

The northern stations showed, as usual for the time of year, decided temperature inversions at levels of moderate height (about 1,500 meters). They were most pronounced at Ellendale, where at 1,500 meters the average temperature was 3.2° higher than on the ground. The average inversion at Ellendale was accumulated for the most in the first decade of the month, when temperatures were usually considerably above normal, owing to cold periods being of but short duration. Typical inversions occurred, for instance, on the 10th, when it was 12° warmer at 1,200 meters than on the ground. On the 31st temperature increased with altitude from -16.8° on the ground to 7.1° at 2,000 meters, and decreased thence to -13.4° at 5,000 meters. These were well-defined examples of the reaction to warmer with free-air winds of south component, following a change to colder with northerly winds. This condition is always productive of large inversions due to the southwesterly to westerly winds aloft bringing higher temperatures more rapidly than the southerly wind near the ground which is mostly dependent on insolation for raising the temperature at the place of observation.

In the latter part of the month, when the cold was more intense and more persistent, the vertical temperature gradients showed a tendency to a more nearly isothermal state. Thus at Ellendale and Drexel, on the 26th and 27th, respectively, the effects of a pronounced HIGH on the vertical temperature gradient are shown by the following figures: Ellendale on the 26th: Ground, -22.3°; 900 meters, -26.1°; 2,000 meters, -20.9°; 2,600 meters, -22.4°. Drexel on the 27th: Ground, -22.8°; 1,200 meters, -26.1°; 2,000 meters, -17.5°;