

overspread the Southwest, bringing record-breaking low temperatures to many parts, especially in Texas, where it was the most severe cold wave in 30 years. There was considerable damage to tender truck in this area as well as some injury to citrus in the lower Rio Grande Valley, but the extreme Southeast escaped severe harm and the cold did not penetrate to the Florida Peninsula. Winter grain crops were largely well protected during the severe weather, but there were some local reports of damage where there was no snow cover. Fruit buds were also reported injured, especially peaches in the Ozark region and the Ohio Valley. Outside operations were generally at a standstill due to the cold and mostly unfavorable conditions.

*Small grains.*—During the first part of the month the general condition of winter wheat was mostly satisfactory, except for local reports of flooding and heaving in the Ohio Valley. Good snows occurred toward the middle of the month, but some areas were bare, especially in western Kansas and Texas; there were some reports of soil blowing in the former State. A light to ample snow blanket covered the far Northwest, while moisture was beneficial in other parts of the West.

During the severe weather of the last part of the month winter grain crops were mostly well protected by an adequate snow cover, except for some bare fields in the southwestern belt and reports of ice in Missouri and Oklahoma. There was much winterkilling in Texas, while oats were largely killed in Arkansas; much wheat was frozen to the ground in western Kansas. In the Southeast and East winter grains were in good condition, but in the Northwest there was some apprehension because of the scanty snow cover.

*Miscellaneous crops.*—Livestock conditions were generally satisfactory during the first part of the month, with some range open in the northern Rocky Mountain region, and range and water conditions were satisfactory in the

Southwest. Toward the middle part of the month the wintry weather over the Great Plains and northern Rocky Mountains caused considerable deterioration of stock, with heavy feeding necessary. Additional snows extended the winter range in Colorado, while precipitation was beneficial in some western parts of the country.

The low temperatures and generally severe weather caused considerable shrinkage of livestock during the latter part of the month, but there were no widespread reports of losses. Heavy feeding was necessary generally over the great western grazing area, although the range was partly open locally, permitting some ranging. Shed lambing began during the latter part of the month in the Northwest, with good results in Idaho, but serious losses in Oregon.

Much truck was planted and replanted in the southern districts during the first part of the month, but there were reports of only fair condition of those crops which escaped the December freezes. The cold waves during the latter part of the month caused extensive damage to truck in the southern area, especially in Texas, where injury was reported south to the lower Rio Grande Valley. There were no extensive reports of harm in the more southeastern areas and the Florida Peninsula was generally free of damaging cold. Satisfactory conditions prevailed in the western trucking portions. Sugar cane grinding in Louisiana was abandoned about the middle of the month due to continued deterioration of the standing cane as well as acidity and decreasing sucrose. There were reports of extensive injury to peach buds in the Ozark regions of Missouri and Arkansas, with apple trees injured in Utah. Satsuma trees in Alabama that were not in healthy condition were also damaged or killed, while there was some injury to citrus in Texas. Citrus were good in most other portions; picking navels and avocados had been suspended in California due to rains, but this work was resumed at the close of the month.

WEATHER OF THE ATLANTIC AND PACIFIC OCEANS

NORTH ATLANTIC OCEAN

By F. A. YOUNG

The weather over the North Atlantic Ocean during January presented some unusual features. Gales were comparatively rare west of the fortieth meridian, as they were not reported on more than three days in any 5° square in that region. On the other hand, the number of days on which they occurred over the eastern section of the steamer lanes was considerably above the normal and exceptionally severe and protracted disturbances prevailed during the second and third decades of the month.

According to press reports, the Dutch S. S. *Veendam* arrived in Halifax, Nova Scotia, on February 5, three days overdue, having encountered on January 30, what Capt. R. W. Braun described as a hurricane, and one of the worst he ever experienced. The vessel was subjected to considerable damage, and two passengers, as well as five members of the crew were injured.

As shown in Table 1, large negative pressure departures still prevailed at the three land stations on the British Isles, the pressure at Lerwick and Valencia remaining below normal during nearly the entire month, while at London barometric readings ranging from 30.28 to 30.01 were reported during the period from the 16th to 22d.

The number of days on which fog was reported in different localities was as follows: Along the American coast between the thirtieth and forty-fifth parallels,

from 5 to 8 days; over the Grand Banks, from 6 to 7 days; in the Gulf of Mexico from 1 to 4 days. The steamer lanes east of the fortieth meridian were unusually free from fog, as it was not reported on more than 2 days in any 5° square in that region.

TABLE 1.—Averages, departures, and extremes of atmospheric pressure at sea level, 8 a. m. (seventy-fifth meridian), North Atlantic Ocean, January, 1930

Stations	Average pressure	Departure	Highest	Date	Lowest	Date
	<i>Inches</i>	<i>Inch</i>	<i>Inches</i>		<i>Inches</i>	
Julianehaab, Greenland.....	29.29	(1)	29.96	15th.....	28.51	21st.
Belle Isle, Newfoundland.....	29.93	+0.13	30.50	12th.....	29.16	16th.
Halifax, Nova Scotia.....	30.21	+0.23	30.88	12th.....	29.62	29th.
Nantucket.....	30.23	+0.18	30.72	5th.....	29.78	15th.*
Hatteras.....	30.21	+0.07	30.68	5th.....	29.68	30th.
Key West.....	30.11	+0.00	30.24	4th.....	29.96	16th.*
New Orleans.....	30.21	+0.05	30.62	4th.....	29.86	14th.
Cape Gracias, Nicaragua.....	29.95	-0.03	29.98	4th.....	29.90	2d.*
Turks Island.....	30.16	+0.11	30.24	19th.....	30.06	8th.
Bermuda.....	30.25	+0.09	30.48	2d.....	29.92	31st.
Horta, Azores.....	30.25	+0.15	30.62	1st.....	29.38	15th.
Lerwick, Shetland Islands.....	29.37	-0.33	30.19	16th.....	28.48	12th.
Valencia, Ireland.....	29.53	-0.37	29.91	2d.....	28.49	31st.
London.....	29.78	-0.22	30.28	16th.....	29.14	11th.

1 No normal available.  
 \* From normals shown on Hydrographic Office pilot charts, based on observations at Greenwich mean noon, or 7 a. m., seventy-fifth meridian time.  
 \* From normals based on 8 a. m. observations.  
 \* And on other date or dates.

From the 2d to 8th, moderate to whole gales occurred over the eastern section of the steamer lanes, and during the same period winds of force 7 and 8 were reported by a

number of vessels between the Bermudas and forty-fifth parallel.

About the 5th, a small cyclonic disturbance developed in approximately latitude 22° 30' N., longitude 56° W., whence it moved rather slowly westward during the ensuing several days. By the morning of the 9th it had reached latitude 27° 30' N., longitude 68° W., and was affecting a number of vessels in that locality. Vessels near the center that have thus far reported to the Weather Bureau experienced moderate to strong gales and high sea. The lowest pressure reported was 29.54 inches. The disturbance, with diminishing intensity, continued to move westward on a course inclining somewhat to the southward and passed through the Florida Strait into the Gulf of Mexico on the 12th-13th. Here, as a shallow depression, it turned northward along the Atlantic seaboard and on the 15th merged with a western continental disturbance in the Gulf of St. Lawrence.

From the 9th to 16th a series of severe disturbances prevailed over an extensive region east of the forty-fifth meridian, and on the 15th and 16th the storm area extended nearly to the thirtieth parallel, with winds of

hurricane force prevailing between the Azores and thirty-fifth meridian as shown by report in table.

From the 18th to 23d, moderate to strong gales were reported over the middle and eastern sections of the steamer lanes, with winds of force 10 and 11 on the 22d and 23d.

On the 26th and 27th northerly to northwesterly gales occurred in the vicinity of the Straits of Gibraltar, and on the latter date a Low was central near 50° N., 30° W., that afterwards developed into the very severe disturbance that swept the eastern section of the ocean during the remainder of the month. Charts VIII to XI cover the period from the 28th to 31st, inclusive; Chart X also shows the disturbance off Hatteras on the 30th, which was the only one of any intensity reported from that region during the month.

The New York Maritime Register reports that the tug *Edgar F. Coney* was sunk in the Gulf of Mexico on January 31, with a loss of 13 lives. An area of high pressure spread over the Gulf on that day but up to time of writing no reports of heavy weather in that locality have been received, although the conditions were favorable for a "norther."

OCEAN GALES AND STORMS, JANUARY, 1930

Vessel	Voyage		Position at time of lowest barometer		Gale began	Time of lowest barometer	Gale ended	Lowest barometer	Direction of wind when gale began	Direction and force of wind at time of lowest barometer	Direction of wind when gale ended	Highest force of wind and direction	Shifts of wind near time of lowest barometer
	From—	To—	Latitude	Longitude									
<b>North Atlantic Ocean</b>													
City of Flint, Am. S. S.	Dundee	Philadelphia	58 42 N	10 30 W	Jan. 1	10 p., 1	Jan. 4	29.46	SW	W 8	NW 9	NW 9	SW-W.
Exbrook, Am. S. S.	Gibraltar	New York	38 36 N	65 45 W	3	10 p., 3	4	29.89	SW	SW, 10	NW	SW, 10	SW-WNW.
Wymeric, Br. S. S.	Shellhaven	Curacao	45 32 N	15 02 W	4	Noon, 4	5	29.44	SW	W, 10	NW	SW, 11	
City of Flint, Am. S. S.	Dundee	Philadelphia	57 14 N	22 44 W	6	3 a., 7	12	29.90	WSW	W, 11	W	—, 11	Steady.
Minnetonka, Br. S. S.	New York	London	49 20 N	19 53 W	10	Noon, 10	11	29.25	SW	WNW	WNW	—, 10	WSW-WNW.
Edgell, Am. S. S.	Houston	do	47 48 N	31 30 W	11	6 p., 11	12	29.38	WNW	WNW	W, 10	—, 10	Var.
Am. Press, Am. S. S.	Manchester	New Orleans	50 22 N	7 00 W	10	6 a., 11	12	29.11	SW	W, 11	WNW	W, 12	SW-W-SW.
Oria, Nor. S. S.	Rotterdam	Boston	50 10 N	5 05 W	10	4 p., 12	14	28.90	SW	WSW, 11	SSW	W, 12	WSW-NW.
Gonzenheim, Ger. S. S.	Emden	do	34 02 N	39 50 W	12	10 p., 14	15	29.95	SW	NW, 9	NW	WSW, 10	WSW-NW.
Independence Hall, Am. S. S.	Havre	New York	39 06 N	32 40 W	7	—, 15	16	29.46	W	NW, 12	NNW	NW, 12	
President Wilson, Am. S. S.	Marseille	do	42 25 N	32 30 W	14	6 a., 15	16	28.87	W	WNW	NW	—, 12	Steady.
Tynfield, Br. M. S.	River Tyne	Baytown	48 25 N	12 00 W	16	10 p., 16	17	29.18	SSE	SSE, 12	SSE	SSE, 12	S-SSE-SSW.
President Roosevelt, Am. S. S.	Charbourg	New York	49 19 N	19 30 W	18	10 a., 18	22	29.47	SW	SW, 8	W	W, 11	SW-W.
Berlin, Ger. S. S.	Bremerhaven	do	49 38 N	30 24 W	21	—, 21	22	29.28	W	W, 10	W	W, 10	
Muenchen, Ger. S. S.	New York	Southampton	49 09 N	16 09 W	23	11 a., 23	23	28.86	S	S, 12	S	S, 12	S-SWSW.
Saco, Am. S. S.	Rotterdam	New York	40 51 N	26 34 W	25	—, 25	25	29.39	NW	NW, 10	NW	—, 10	Steady.
Scantico, Am. S. S.	Naples	Tampa	34 12 N	11 20 W	25	1 a., 26	27	29.67	WSW	NW, 10	N	NW, 10	WSW-SW-NW.
Dresden, Ger. S. S.	Cobh	New York	50 08 N	23 55 W	27	4 p., 27	29	29.10	S	SW, 8	WNW	W, 11	
Cabo Espartel, Span. S. S.	Malaga	do	30 00 N	67 00 W	28	8 a., 28	30	30.01	N	N, 5	ENE	ENE, 10	
West Cobalt, Am. S. S.	New Orleans	Liverpool	49 34 N	20 16 W	27	Mt. dt. 28	29	29.42	WSW	W, 9	W	WSW, 10	Steady.
Quaker City, Am. S. S.	Dundee	Philadelphia	58 20 N	30 10 W	27	2 a., 29	29	28.90	S	SE, 8	N	SE, 10	
Milwaukee, Ger. S. S.	Bishops Rock	New York	49 12 N	22 08 W	28	11 a., 29	31	29.34	WSW	W, 9	SE	W, 12	WSW-WNW.
El Almirante, Am. S. S.	New Orleans	do	33 00 N	77 00 W	29	11 a., 29	31	30.08	NNE	NNE, 8	NNW	NW, 10	
George Washington, Am. S. S.	Cobh	do	47 08 N	40 25 W	30	4 a., 30	31	29.53	WSW	WSW, 10	NW	W, 12	SE-WSW.
Dresden, Ger. S. S.	do	do	47 26 N	37 29 W	30	Noon, 30	31	29.23	W	W, 10	WNW	W, 12	
Veendam, Du. S. S.	Rotterdam	do	49 25 N	33 20 W	26	11 a., 30	30	28.84	ENE	W, 9	WNW	WNW, 12	S-W.
Lord Kelvin, Br. S. S.	Halifax	Cable repairs	43 22 N	56 25 W	31	1 a., 31	31	30.04	ENE	ENE, 8	NNW	E, 10	E-NNW.
Balsam, Am. S. S.	Cork	New York	45 16 N	23 07 W	31	Noon, 31	Feb. 1	28.98	NW	NW, 12	W	NW, 12	NW-W.
Belleplaine, Am. S. S.	Antwerp	do	49 30 N	21 04 W	28	8 a., 31	1	28.32	S	WSW, 11	WNW	NW, 12	WSW-NW.
West Harcourar, Am. S. S.	Bremen	Boston	44 02 N	12 09 W	30	8 p., 30	1	29.61	SW	SW, 9	W	W, 11	SW-W.
<b>North Pacific Ocean</b>													
Carlier, Belg. S. S.	Muroran	Vancouver	42 01 N	178 23 W	1	—, 2	2	29.65	SSE	S, 9	S	S, 12	
Siberia Maru, Jap. S. S.	Victoria	Yokohama	47 40 N	165 40 E	1	Mdt., 2	3	28.92	ESE	SW, 7	WSW	SSW, 12	SSW-WSW.
Chief Capilano, Br. S. S.	Seattle	do	45 13 N	159 10 E	1	8 a., 1	3	28.15	E	ENE, 8	WNW	W, 12	ENE-N.
Golden Dragon, Am. S. S.	San Francisco	Shanghai	48 00 N	142 00 W	1	—, 1	4	29.70	WSW	SW, 9	NW	WNW, 10	SW-W.
Kaisho Maru, Jap. S. S.	Muroran	Vancouver	47 10 N	160 10 E	1	4 p., 4	5	29.14	NNW	W	SW	W, 11	6 pts.
Northwestern, Am. S. S.	Seattle	Seward	58 41 N	139 20 W	2	6 p., 2	3	29.99	NE	NE, 7	NE	NE, 9	Steady.
Pres. Taft, Am. S. S.	San Francisco	Yokohama	34 30 N	166 05 E	2	10 p., 3	4	29.12	NNW	SW, 10	NNW	SW, 10	SW-NW.
San Rafael, Am. S. S.	Portland	Canal Zone	12 30 N	94 30 W	3	6 p., 4	4	28.76	NE	NE, 9	N	NNW, 9	SW-WSW.
Pres. McKinley, Am. S. S.	Victoria	Yokohama	49 35 N	178 45 W	3	4 a., 5	6	28.74	SW	WSW	W	WSW, 11	S-SSW.
Nevada, Am. S. S.	Manila	San Francisco	39 00 N	175 45 E	4	6 p., 4	4	29.54	S	S, 11	W	S, 11	SE-SW.
Akagisan Maru, Jap. M. S.	Yokohama	do	48 44 N	179 25 W	4	Noon, 4	4	28.99	SE	S, 10	S	S, 11	ENE-E.
Pres. Lincoln, Am. S. S.	do	do	26 20 N	149 30 W	4	2 p., 4	6	29.75	ENE	ENE, 6	E	E, 9	
Lubrico, Am. S. S.	Richmond	Honolulu	35 49 N	129 45 W	6	4 a., 6	6	30.06	NW	NW, 8	N	NW, 9	
Golden Dragon, Am. S. S.	San Francisco	Shanghai	51 02 N	165 15 W	6	—, 7	7	29.74	SSE	SSE, 9	SW	SSE, 9	Steady.
Pres. Cleveland, Am. S. S.	Yokohama	Victoria	49 10 N	179 30 W	7	11 p., 7	7	28.67	E	E, 5	SW	SSW, 10	
Kurohime Maru, Jap. S. S.	Wakamatsu	Grays Harbor	49 36 N	179 25 W	8	7 p., 10	11	28.45	SW	ESE, 9	S	ESE, 11	SE-ESE.
Sierra, Am. S. S.	Pago Pago	San Francisco	35 40 N	129 20 W	9	1 a., 9	9	30.09	NW	NW, 7	—	—, 10	Steady.
Teumseh, Br. S. S.	San Pedro	Osaka	32 45 N	155 03 E	9	Noon, 9	9	29.70	W	W, 9	WNW	W, 10	W-WNW.
Mauna Ala, Am. S. S.	Seattle	Honolulu	31 25 N	150 50 W	9	1 p., 10	10	29.80	E	ESE, 10	SSE	E, 10	E-SSE.
Tahchee, Br. S. S.	Shanghai	San Pedro	38 50 N	162 27 E	9	6 p., 9	12	29.07	NE	NNE, 9	WNW	N, 10	NNE-N.
Calawali, Am. S. S.	Honolulu	Los Angeles	30 06 N	126 37 W	10	Mdt., 10	11	29.88	WNW	WNW, 9	NW	WNW, 9	WNW-NW.

OCEAN GALES AND STORMS, JANUARY, 1930—Continued

Vessel	Voyage		Position at time of lowest barometer		* Gale began	Time of lowest barometer	Gale ended	Lowest barometer	Direction of wind when gale began	Direction and force of wind at time of lowest barometer	Direction of wind when gale ended	Highest force of wind and direction	Shifts of wind near time of lowest barometer
	From—	To—	Latitude	Longitude									
<b>North Pacific Ocean—Continued</b>													
Courageous, Am. M. S.	Manila	Shanghai	20 17 N	120 55 E	11	1 p, 11	13	30.02	NNE	NNE, 6	NE	NNE, 9	
Emp. of Asia, Br. S. S.	Vancouver	Honolulu	31 35 N	148 64 W	11	2 p, 15	18	29.30	S	WSW, 8	W	W, 9	WSW-W.
Lubrico, Am. S. S.	Richmond	do	28 02 N	146 45 W	9	Noon, 10	10	29.68	E	SE, 9	SSE	SE, 9	SE-SSW.
Do	do	do	23 00 N	154 30 W	12	8 p, 12	13	29.68	SW	SW, 9	NW	NW, 10	SW-NW.
Kaisho Maru, Jap. S. S.	Muroran	Vancouver	49 50 N	151 00 W	12	2 a, 15	10	29.57	SE	E	E	E, 12	4 pts.
Hawaii Maru, Jap. S. S.	San Pedro	Yokohama	30 05 N	175 00 W	12	Noon, 15	17	29.57	NNW	NW, 8	NW	NW, 9	NW-WNW.
Wilhelmina, Am. S. S.	Honolulu	Seattle	45 08 N	131 16 W	13	8 a, 14	14	29.60	NW	W, 10	NW	NW, 11	W-NW.
Tahchee, Br. S. S.	Shanghai	San Pedro	38 20 N	172 13 W	13	5 a, 14	14	28.98	W	W, 10	NW	NW, 9	WSW-W.
Cingalese Prince, Br. M. S.	San Pedro	Yokohama	29 37 N	175 40 E	13	4 a, 14	14	29.85	WSW	WSW, 8	NW	NW, 9	
Seattle, Am. S. S.	Hakodate	Seattle	50 20 N	152 26 W	13	1 p, 16	16	28.81	E	E, 8	S	NE, 11	E-ENE.
Glentworth, Br. S. S.	San Pedro	Kobe	33 36 N	170 58 W	13	—, 16	21	29.08	N	WSW, 10	SW	W, 12	
Kurohime Maru, Jap. S. S.	Wakamatsu	Grays Harbor	50 00 N	158 30 W	14	1 p, 14	15	29.16	E	E, 7	E	E, 11	ESE-E.
Silvercobar, Br. M. S.	Sourabaya	San Francisco	33 22 N	164 00 W	14	11 p, 16	17	29.09	WSW	W, 8	WSW	W, 10	SW-W.
Pres. Harrison, Am. S. S.	San Francisco	Honolulu	27 49 N	147 00 W	15	10 a, 15	16	29.64	SW	SW, 8	NW	W, 10	SW-W.
Tahchee, Br. S. S.	Shanghai	San Pedro	38 07 N	158 55 W	16	6 p, 16	16	29.07	SSE	SSE, 10	SSW	SSE, 10	SSE-S.
Wilhelmina, Am. S. S.	Seattle	Honolulu	47 50 N	125 45 W	17	8 a, 17	17	29.54	E	E	E	E, 9	E-ESE.
Cambrai, Am. S. S.	Manila	San Francisco	34 12 N	170 06 E	17	2 a, 17	17	29.25	W	WNW, 8	WNW	WNW, 11	Steady.
Choyo Maru, Jap. S. S.	Uraga	Coos Bay	47 06 N	168 40 E	18	4 p, 19	20	28.45	WSW	W, 7	SW	WSW, 10	WSW-W.
Toyama Maru, Jap. S. S.	Yokohama	Victoria	49 41 N	186 00 W	20	Mt., 20	21	29.18	SE	ESE, 9	SE	ESE, 9	ESE-SE.
Glentworth, Br. S. S.	San Pedro	Kobe	33 10 N	169 50 E	24	8 a, 24	24	29.52	S	N, 10	W	WNW, 12	WSW-NW.
Do	do	do	33 08 N	164 33 E	25	2 p, 25	26	29.52	S	N, 10	WNW	SW, 11	SW-NW.
Montana, Am. S. S.	Yokohama	Seattle	49 40 N	178 40 E	25	10 a, 26	26	29.32	ESE	ESE, 9	SE	ESE, 9	ESE-SE.
Modjerkoto, Du. S. S.	Balik	Los Angeles	33 20 N	155 20 W	28	2 p, 28	28	29.51	W	W, 8	SW	NW, 9	NW-WNW.
Tatsuno Maru, Jap. S. S.	Yokohama	San Francisco	40 40 N	152 29 E	29	4 p, 30	31	28.72	SE	SW, 8	SW	SSE, 9	
Ibukisan Maru, Jap. S. S.	do	do	39 58 N	150 25 W	29	Noon, 30	31	28.78	SSE	SW, 9	W	W, 10	
Montana, Am. S. S.	do	Seattle	50 20 N	159 48 W	30	Noon, 31	31	28.76	N	—, 8	NW	—, 9	N-N W.
Pres. Taft, Am. S. S.	do	do	44 00 N	157 00 E	30	6 a, 30	31	29.18	E	SE, 11	ESE	SE, 11	E-SE.

NORTH PACIFIC OCEAN

By WILLIS E. HURD

A very unusual average pressure condition characterized the weather of the central and northern portions of the North Pacific Ocean during January, 1930. The Aleutian cyclone, which ordinarily appears centered over the Gulf of Alaska or nearly along the chain of the Aleutian Islands, now lay farther southward in midocean. To its eastward the California-Pacific anticyclone, although at times occupying its normal position, was for the most part restricted to extreme eastern and north-eastern waters. The average oceanic maximum of about 30.30 inches covered the upper eastern part of the Gulf of Alaska and British North America. The average barometer at Juneau and Kodiak was, respectively, 0.56 and 0.45 inch above the normal. This anticyclonic condition gave the lower Alaskan coast, as exemplified by Juneau, the clearest skies on record for any month. Over the central and west-central parts of the ocean, between latitudes 30° and 50° N., the low pressure was associated with extraordinary meteorological activity, marked by high winds, frequent rains, snows, and hail squalls, departures from the usual prevailing winds, and the extension of abnormally low monthly pressures into tropical latitudes. At Honolulu the negative pressure departure was slightly more than a tenth of an inch. At Midway Island the average pressure was 29.89 inches, which may be compared with the value of 29.81 inches in January, 1916, when the absolute minimum of record at that station occurred.

In the Far East more normal conditions prevailed. Several minor cyclones appeared in various parts of the sea, but during most of the month high pressure overlay China and the adjoining coastal waters, with the result that the northeast monsoon prevailed from the Eastern to the China Sea with few intermissions.

Barometric data for several island and coast stations in west longitudes, including Point Barrow on the Arctic Ocean, are given in the following table:

TABLE 1.—Averages, departures, and extremes of atmospheric pressure at sea level at indicated hours, North Pacific Ocean and adjacent waters, January, 1930

Stations	Average pressure	Departure from normal	Highest	Date	Lowest	Date
	Inches	Inch	Inches		Inches	
Point Barrow <sup>1</sup>	30.25		30.70	27th	29.50	6th.
Dutch Harbor <sup>1</sup>	29.79	+0.15	30.58	2d	29.14	17th.
St. Paul <sup>1</sup>	29.82	+0.13	30.60	27th	29.00	13th.
Kodiak <sup>1</sup>	30.20	+0.56	30.64	26th	29.12	21st.
Midway Island <sup>1</sup>	29.89	-0.11	30.16	3d	29.50	29th.
Honolulu <sup>2</sup>	29.89	-0.12	30.09	31st	29.72	28th.
Juneau <sup>3</sup>	30.33	+0.45	30.74	14th	29.18	31st.
Tatoosh Island <sup>4</sup>	30.05	+0.11	30.57	20th	29.36	4th.
San Francisco <sup>5</sup>	30.04	-0.05	30.36	21st	29.65	10th.
San Diego <sup>6</sup>	30.03	-0.03	30.29	22d	29.75	11th.

<sup>1</sup> P. m. observations only. <sup>2</sup> And on 28th. <sup>3</sup> A. m. and p. m. observations. <sup>4</sup> For 26 days. <sup>5</sup> For 30 days. <sup>6</sup> Corrected to 24-hour mean.

Few, if any, months since our special studies of the weather of the North Pacific Ocean began have been so generally stormy as was January, 1930, winds of storm to hurricane force in themselves occurring on at least 11, and probably more, days. On the American-Hawaiian routes, though none of the deep cyclones characteristic of more westerly areas occurred there, several active depressions formed and the accompanying gales of force 8 to 10 were encountered on at least 13 days out of the first 16 of the month. These were largely experienced some 10 to 20 degrees northeast of the islands, the frequency lessening considerably thence toward the California coast. In the vicinity of Hawaii gales occurred on the 13th and 15th, being of force 10 from the northwest in the lee of Oahu Island on the 13th. At Tatoosh Island, Wash., winds of force 11 were registered at the Weather Bureau station on the 16th and 17th, and lesser high velocities on several other days. Over the eastern part of the ocean there were fewer days with gales on the upper than on the lower routes this month. The easternmost gales to attain hurricane force occurred on the 15th near the fiftieth parallel between 150° and 160° west longitude. This was in the region of greatest pressure gradient between the Alaskan anticyclone and the extensive mid-Pacific cyclone of that date.