OCEAN GALES AND STORMS, MAY, 1931

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									
NORTH ATLANTIC OCEAN			° ′	° ′				*Inches*					
Ima, Nor. M. S.	Singapore	Lands End	3 10 N	12 08 W	May 2	1 p. 2	May 2		NE.	NE, 8	NE.	NE, 9	Steady.
Greystoke Castle, Br. M. S.	Port Said	New York	39 23 N	65 00 W	May 3	9 a. 3	May 3	29.74	S.	S, 7	W.	—, 8	S-SSW.
Boston City, Br. S. S.	Fowey	Portland, Me.	45 13 N	38 52 W	May 4	2 p. 6	May 8	29.54	S.	WNW.	NW.	NW, 9	W-WNW.
General von Steuben Ger. S. S.	Southampton	New York	43 14 N	43 31 W	May 6	9 a. 6	May 7	29.57	W.	WSW, 7	NW.	WNW, 9	
East Indian, Am. S. S.	Antwerp	do	45 30 N	42 15 W	May 7	2 p. 7	May 8	29.16	WNW.	W, 9	NNW.	WNW, 10	W-NNW.
Sarcoxie, Am. S. S.	Harve	do	46 41 N	30 25 W	do	7 a. 7	do	29.28	S.	W, 10	W.	W, 10	S-W.
Tulsa, Am. S. S.	Manchester	Savannah	50 08 N	19 50 W	May 10	1 p. 10	May 10	29.48	SSW.	SSW, 9	W.	SSW, 9	SSW-W.
Bellhaven, Am. S. S.	Boston	Manchester	48 31 N	38 50 W	do	Mdt. 11	May 13	29.01	SW.	SW, 7	WNW.	W, 11	SW-W.
Dresden, Ger. S. S.	Bremerhaven	New York	48 54 N	26 06 W	May 11	8 p. 11	May 12	29.37	SSW.	SW, 10	WNW.	W, 10	
Statendam, Du. S. S.	Rotterdam	do	47 50 N	25 36 W	do	10 a. 12	May 13	29.67	SSW.	WSW, 8	WNW.	WSW, 9	WSW-W.
Europa, Gr. S. S.	Cherbourg	do	49 04 N	19 24 W	May 12	2 a. 13	do	29.54	SSW.	WSW, 7	W.	W, 10	WSW-W.
Bannock, Am. S. S.	Cork	do	50 43 N	30 42 W	May 17	2 a. 17	May 20	29.37	SW.	SW, 6	NW.	W, 10	SW-W.
Ambridge, Am. S. S.	Antwerp	do	49 08 N	21 58 W	do	Noon 17	May 18	29.23	WNW.	WNW, 8	NW.	WNW, 10	WNW-NW.
Meanticut, Am. S. S.	Rotterdam	Galveston	46 17 N	14 41 W	do	do	do	29.34	W.	W, 7	NW.	WNW, 10	W-WNW.
Ambridge, Am. S. S.	Antwerp	New York	46 49 N	31 23 W	May 19	Noon 19	May 22	29.87	WSW.	WSW, 7	W.	W, 10	
Jean Jadot, Belg. S. S.	do	do	47 00 N	30 00 W	May 21	4 p. 21	do	29.51	NW.	NW, 8	NW.	—, 10	
Elmsport, Am. S. S.	Hull	Jacksonville	42 05 N	21 10 W	do	6 p. 21	May 23	29.63	WNW.	NW, 10	WNW.	NW, 10	WNW-NW.
Gonzenheim, Ger. S. S.	Emden	Baltimore	50 43 N	17 33 W	May 22	4 a. 23	May 24	29.13	ESE.	NE, 10	NNW.	N, 10	NE-N.
SOUTH ATLANTIC OCEAN													
Lekhaven, Du. S. S.	Buenos Aires	Amsterdam	32 40 S	49 10 W	May 3	Noon 5	May 6	29.67	SW.	WNW, 8	WSW.	WNW, 9	
Portfield, Br. S. S.	Penarth	River Plate	34 30 S	53 00 W	May 19	8 p. 19	May 20	29.37	SW.	SW, 8	SW.	SW, 9	Steady.
NORTH PACIFIC OCEAN													
Golden Star, Am. S. S.	Hong Kong	San Francisco	43 10 N	159 35 E	Apr. 30	6 p. 30	May 1	29.03	SE.	SE, 8	SW.	SE, 9	SE-SW.
Chattanooga City, Am. S. S.	Kahului	Kobe	30 05 N	154 30 E	May 1	8 a. 2	May 2	29.65	SW.	W, 8	N.	W, 8	SW-W-WNW.
Grays Harbor, Am. S. S.	Hong Kong	San Francisco	27 08 N	123 58 E	May 7	2 p. 8	May 8	29.92	NW.	NNW, 8	N.	NNW, 8	N-NNW.
Resolute, Ger. S. S.	Hilo	do	37 17 N	123 38 W	do	Mdt. 7	do	30.09	NNE.	N, 8	N.	N, 9	Steady.
Golden Star, Am. S. S.	Hong Kong	do	[1]47 00 N	154 00 W	May 8		May 9		SSE.		WNW.	SW, 11	
Silveryew, Br. M. S.	San Francisco	Yokohama	45 54 N	170 40 E	May 9	4 p. 9	May 10	29.68	SW.	SW, —	NNW.	W, 10	SW-W.
Pres. Taft, Am. S. S.	Victoria	do	50 14 N	177 04 E	do	1 a. 10	do	29.12	S.	WSW 8	NW.	WNW, 9	WSW-W-WNW
Fukuyo Maru, Jap. S. S.	Japan	Coos Bay	46 35 N	166 35 E	May 8	10 p. 8	May 12	[2]29.69	SW.	WSW, —	WNW.	WNW, 9	
San Diego Maru, Jap. M. S.	Elwood	Kudamatsu	33 25 N	137 25 E	May 11	6 p. 12	May 13	29.72	E.	NE, 10	NE.	NE, 10	E-NE.
Everett, Am. S. S.	Tacoma	Yokohama	51 37 N	172 00 W	May 12	6 p. 12	do	29.33	NE.	NE, 7	NW.	NW, 9	N-NW.
Chief Capilano, Br. S. S.	Yokohama	Port Alberni	49 11 N	179 37 W	May 13	2 p. 13	May 14	29.05	E.	NNE, 7	NW.	NNE, 8	NNE-N-NNW.
Shelton, Am. S. S.	Aomori	San Francisco	48 20 N	156 30 W	May 15	2 a. 15	May 16	[2]29.27	WNW.	WNW, 8	W.	N, 9	WNW-W.
Oregon, Am. S. S.	Weihaiwei	do	32 41 N	133 54 E	do	Noon 15	do	29.37	SE.	SE, 11	WSW.	SE, 11	SE-SSE.
Emidio, Am. S. S.	San Pedro	Vancouver	35 40 N	121 36 W	May 16	6 p. 16	May 19	30.02	NW.	NW, 7	N.	N, 9	
Silverhazel, Br. M. S.	Honolulu	San Francisco	37 15 N	123 30 W	May 17	8 a. 18	May 18	30.15	NNW.	NNW, 8		NNW, 10	Steady.
Everett, Am. S. S.	Tacoma	Yokohama	39 00 N	144 05 E	May 22	6 p. 23	May 24	29.22	SE.	S, 8	NNW.	SE, 10	SE-S-NW.
Hakubasan Maru, Jap. M. S.	Yokohama	San Francisco	[3]42 27 N	162 15 W	May 25	— 25	May 26	[3]29.30	NNE.	NNE, —		NNE, 9	NNE-SSE.
SOUTH PACIFIC OCEAN													
Brunswick, Pan. M. S.	San Pedro	Auckland	35 00 S	177 00 E	May 7	4 a. 8	May 8	[2]29.44	NNE.	SE, 10	SSE.	SE, 10	ENE-SE.
Crown City, Am. M. S.	Port Lincoln	Shanghai	35 34 S	122 46 E	May 9	Noon 11	May 13	29.25	NE.	NW, 10	SW.	NW, 11	NE-N-NW.

[1] Position approximate. [2] Barometer uncorrected. [3] From G. M. N. observation.

NORTH PACIFIC OCEAN

By WILLIS E. HURD

Atmospheric pressure.—Sharp contrasts of atmospheric pressure between different periods of the month occurred over most of the Aleutian region and the Gulf of Alaska during May, 1931. For the first 17 days a fairly strong development of the Aleutian cyclone was in evidence, and for the last 14 days a considerable reversal of the LOW in favor of strong high pressure occurred, with barometer readings as high as 30.60 inches on the 19th and 22d, so that the average for the month showed practically normal pressure over the entire gulf and the Aleutians.

In the region usually occupied by the North Pacific HIGH there were few intruding low-pressure areas in May, and none of a marked stormy nature, the anticyclone remaining generally in a well developed state in west longitudes.

In middle latitudes on the Asiatic side of the ocean pressure was unstable, and numerous LOWS appeared, some of continental and some of oceanic origin. These caused frequently unsettled weather, such as is characteristic of the transition period between the summer and winter monsoons.

The following table gives barometric data for several island and coast stations in west longitudes, including Point Barrow on the Arctic Ocean.

TABLE 1.—*Averages, departures, and extremes of atmospheric pressure at sea level at indicated hours, North Pacific Ocean and adjacent waters, May, 1931*

Stations	Average pressure	Departure from normal	Highest	Date	Lowest	Date
	Inches	*Inch*	*Inches*		*Inches*	
Point Barrow [1] [2]	30.11	+0.02	30.90	1st	29.44	24th.
Dutch Harbor [1]	29.88	+0.04	30.64	22d	29.08	10th.
St. Paul [1] [2]	29.88	+0.04	30.60	22d	29.04	5th.
Kodiak [1]	29.79	−0.05	30.60	19th	29.16	4th. [3]
Midway Island [1]	30.09	+0.04	30.30	19th	29.68	1st.
Honolulu [4]	30.03	−0.02	30.13	15th	29.92	20th.
Juneau [4]	29.97	−0.02	30.60	19th	29.39	23d.
Tatoosh Island [4] [5]	30.09	+0.05	30.59	18th	29.67	21st.
San Francisco [4] [5]	29.94	−0.04	30.18	17th	29.75	21st.
San Diego [4] [5]	29.93	0.00	30.03	23d	29.84	25th.

[1] P. m. observations only.
[2] For 30 days.
[3] And on the 10th.
[4] A. m. and p. m. observations.
[5] Corrected to 24-hour mean.

Cyclones and gales.—With the near approach of summer there was a considerable diminution of storminess over

the upper and middle waters of the North Pacific, and no severe disturbances seem to have occurred in the tropics. The regions over which the principal gales of the month occurred may be grouped as follows: One lying immediately south of Japan; another stretching southwestward from the western Aleutians well toward northern Japan; a third running closely along the American coast between Vancouver Island and about Point Conception, Calif.

The gales in lower Japanese waters were mostly caused by two cyclones which came from the Asiatic mainland near the middle of the month. The earlier passed along the lower coasts of the islands and caused strong to whole gales on the 12th. The second cyclone at time of greatest intensity was central over the Japan Sea on on the 15th, during which day gales with force as high as 11 occurred in the southern quadrants east of Kiushu Island. On the 23d, in connection with another cyclone over the Archipelago, a whole southeast gale was reported near the east coast of Honshu.

For that portion of the upper steamship routes lying southwest of the Aleutians the principal gale period embraced the 9th to 11th, with local maximum wind forces of 9 and 10 on the 9th. On other days scattered gales were encountered by steamships, but none was reported as exceeding force 8.

In the American coastal region northerly to westerly gales occurred on the 7th to 9th, and again on the 17th to 19th. In the earlier period the high velocities were due to the steep pressure gradients on the eastern slope of the Pacific anticyclone impinging upon a LOW, the western side of which bordered on the coast. At this time the strongest gale reported was of force 9, experienced about 100 miles west of San Francisco. In the second period there was a strong concentration of the ocean HIGH off the Washington and Oregon coasts, and in consequence of steep gradients east of the crest anticyclonic gales of force 8 to 10 roughened the weather off Oregon and the upper half of California, with moderate gales (force 7) covering a wider range of sea.

The only severe gale mentioned for the entire ocean area apart from the regions noted was a southwesterly wind of storm force (11) reported on the 8th in approximately 47° N., 154° W., this locality being at the time under the influence of the Aleutian disturbance.

Winds at Honolulu.—At Honolulu the prevailing direction of the wind during May was from the northeast, with maximim velocity 25 miles from the east on the 4th. An unusually large number of *konas*, or southerly winds, was reported.

Fog.—Fog showed a distinct increase in frequency over that of April throughout the western part of the upper routes. It was reported on 20 days for the whole region between latitudes 40° and 50° N., and longitude 180° and the Japanese coast. It was most frequent between longitudes 150° and 170° E., where it formed in some 5-degree localities on approximately one-third of the days of the month. East of 180°, in these latitudes, fog occurrence diminished to three or less days per 5-degree square, except east of 160° W., where it became slightly more frequent. Between 40° and 45° N., 130° and 140° W., the whole area seems to have been mantled in fog during the first five days. Between Tatoosh Island and San Diego, 10 to 20 per cent of the days had fog, the highest percentage forming near the coast below San Francisco.

BUCKET OBSERVATIONS OF SEA-SURFACE TEMPERATURES

By GILES SLOCUM

STRAITS OF FLORIDA AND CARIBBEAN SEA

The temperatures herein published are the means of the average temperatures for the four quarters of the month, except that, in the case of the 5-degree subdivisions of the Caribbean Sea, the figures shown are the simple means of the observed temperatures with the entire month taken as a unit. Table 1 shows the lengths of the quarters for each length of month.

Table 2 shows the average temperature for the Caribbean Sea and the Straits of Florida for May of each year from 1919 to 1930, inclusive, and Table 3 summarizes the temperature for the month in the same areas, including the departures of the May, 1930, means from the 11-year means for May, 1920–1930, and the changes from the temperatures, for the preceding month of April, 1930.

The chart shows the number of observations taken during the month of May, 1930, within each 1-degree square; the mean temperature of the Straits of Florida, and of each 5-degree[1] subdivision of the Caribbean Sea; the 11-year means (1920–1930) for these areas; and the local mean time corresponding to Greenwich mean noon, at which time the mariners are instructed to make the temperature readings.

May is a month of rapid warming of the surface water in the Straits of Florida, being second only to June in this respect, while in the Caribbean Sea, the greatest upward change in the temperature takes place, on the average, during this month. The amount of this rise in temperature averages somewhat more than 1° in the Caribbean Sea, and nearly 2½° in the Straits of Florida.

During May the principal discharge from the Caribbean Sea, at the Yucatan Channel, begins to follow summer tracks, with relatively little of the water taking the direct route north of Cuba and out the Straits of Florida. A considerable bulk of the water makes instead a circuit of the entire Gulf of Mexico. Summer conditions have begun to prevail in the Mexican and Gulf States littoral, and consequently, the near-by land is slightly warmer than the sea currents over most of the route.

The water from the Caribbean, mixed with that from more local Gulf currents, finally approaches the vicinity of the Straits of Florida from the west and northwest, having been flowing at all times during the circuit, with relatively low velocity. Examination of current charts indicates that the rates of flow during May are such that the currents setting north and northwest from the Yucatan Channel at this time can hardly complete more than a minor fraction of their circuit in a month; it is therefore presumable that in the latter part of May and in early June, the current through the Straits of Florida may normally contain a minimum of direct flow from the Caribbean through the Yucatan Channel past the northwestern coast of Cuba.

Temperatures were somewhat above the average, during the month of May, 1930, in the region immediately southwest of the Leeward Islands and generally in the Caribbean Sea west of 75° W., and approximately

[1] In three cases, as indicated on the chart, the observations from small, little traveled, and unimportant areas at the outer limits of the Caribbean Sea have been treated as parts of contiguous 5-degree subdivisions.