TABLE 4.—*Mean altitudes and temperatures of significant points identifiable as tropopauses during June 1940, classified according to the potential temperatures (10° intervals between 290° and 409° A.) with which they are identified (based on radiosonde observations)*—Continued

Potential temperatures, °A.	Medford, Oreg.			Miami, Fla.			Nashville, Tenn.			Oakland, Calif.			Oklahoma City, Okla.			Omaha, Nebr.			Phoenix, Ariz.		
	Number of cases	Mean altitude (km.) m. s. l.	Mean temperature ° C.	Number of cases	Mean altitude (km.) m.s. l.	Mean temperature ° C.	Number of cases	Mean altitude (km.) m. s. l.	Mean temperature ° C.	Number of cases	Mean altitude (km.) m.s. l.	Mean temperature ° C.	Number of cases	Mean altitude (km.) m. s. l.	Mean temperature ° C.	Number of cases	Mean altitude (km.) m. s. l.	Mean temperature ° C.	Number of cases	Mean altitude (km.) m. s. l.	Mean temperature ° C.
290–299																					
300–309																					
310–319	1	9.5	−46.0																		
320–329	9	9.9	−48.9				2	9.8	−44.5	6	9.8	−45.2	6	10.3	−51.2	3	9.2	−40.0	2	10.2	−48.0
330–339	23	11.1	−52.8	2	10.4	−44.5	13	10.8	−48.8	24	10.9	−49.4	6	10.8	−47.8	12	10.4	−43.5	15	10.7	−46.8
340–349	24	12.2	−56.4	16	12.7	−59.4	12	12.8	−60.4	18	12.2	−56.2	25	12.6	−58.8	22	12.4	−57.6	25	12.0	−52.6
350–359	11	12.9	−57.5	19	14.2	−67.1	17	13.6	−62.1	13	13.3	−61.0	10	13.6	−63.3	14	13.7	−64.2	14	13.4	−60.1
360–369	6	14.1	−60.3	12	15.1	−70.5	4	14.6	−66.8	7	13.8	−61.1	4	14.9	−68.2	4	13.8	−59.0	3	14.3	−62.7
370–379	4	14.9	−63.0	3	15.3	−67.3	8	17.2	−67.8	7	14.8	−65.4	3	15.5	−70.3	1	14.2	−60.0	7	15.2	−66.1
380–389	6	15.4	−63.2	5	16.5	−72.6	3	15.5	−66.0	8	15.5	−65.2	2	16.0	−69.5	4	15.1	−61.0	6	15.9	−68.2
390–399	1	16.6	−69.0	5	17.0	−73.0	4	15.7	−62.2	5	16.3	−65.8	3	16.4	−68.3	2	16.0	−62.0	4	16.3	−65.2
400–409	5	16.7	−65.0	2	17.3	−72.0	2	16.9	−68.0	5	16.6	−65.0	1	17.3	−69.0	3	15.0	−64.7	8	17.2	−69.5
Weighted means		12.5	−56.4		14.4	−66.2		13.6	−59.9		12.9	−57.2		13.0	−59.9		12.7	−56.4		13.3	−57.5
Mean potential temperature ° A. (weighted)		349.5			361.0			356.4			354.7			350.4			352.5			358.0	
Number days with observations		28			24			29			28			26			25			27	

Potential temperatures, ° A.	Portland, Maine			St. Louis, Mo.			San Antonio, Tex.			San Diego, Calif.			Sault Ste. Marie, Mich.			Spokane, Wash.			Atlantic Station			Atlantic Station		
	Number of cases	Mean altitude (km.) m.s.l.	Mean temperature ° C.	Number of cases	Mean altitude (km.) m.s.l.	Mean temperature ° C.	Number of cases	Mean altitude (km.) m.s.l.	Mean temperature ° C.	Number of cases	Mean altitude (km.) m.s.l.	Mean temperature ° C.	Number of cases	Mean altitude (km.) m.s.l.	Mean temperature ° C.	Number of cases	Mean altitude (km.) m.s.l.	Mean temperature ° C.	Number of cases	No. 1[1] Mean altitude (km.) m.s.l.	Mean temperature ° C.	Number of cases	No. 2[2] Mean altitude (km.) m.s.l.	Mean temperature ° C.
290–299													1	6.7	−41.0									
300–309	2	7.0	−35.5																					
310–319	8	7.9	−38.2										5	8.1	−42.2	1	8.4	−40.0				1	7.6	−33.0
320–329	9	9.4	−44.4	4	9.4	−45.0	1	12.6	−69.0	2	9.8	−44.0	6	9.6	−46.2	14	9.8	−48.5	2	9.6	−42.5	7	9.4	−41.7
330–339	20	10.9	−50.6	11	11.2	−50.9	9	11.2	−51.7	10	10.9	−49.5	18	11.0	−53.5	21	11.2	−54.1	15	10.5	−45.9	24	11.2	−52.9
340–349	22	12.5	−59.3	20	12.3	−56.0	25	12.0	−53.2	7	12.5	−58.6	16	12.5	−60.9	12	12.0	−56.2	21	12.7	−57.5	16	12.4	−58.9
350–359	10	13.2	−61.2	15	13.5	−62.6	16	13.2	−57.9	6	13.3	−60.8	6	13.0	−60.5	7	13.0	−57.7	17	13.6	−62.7	10	13.1	−60.5
360–369	5	13.3	−56.6	8	14.4	−64.6	13	14.6	−65.8	3	14.1	−61.7	1	13.6	−59.0	2	13.8	−58.5	5	14.3	−64.4	6	14.0	−61.0
370–379	4	14.7	−63.2	2	15.0	−64.0	6	15.2	−65.7	2	14.8	−64.5	2	14.0	−60.0	2	14.8	−64.0	1	15.1	−66.0	2	15.1	−66.5
380–389	6	14.3	−54.7	8	15.8	−65.1	4	16.0	−67.8	4	15.7	−67.0	4	14.0	−54.0	4	14.4	−55.2	4	15.2	−61.5	1	14.7	−58.0
390–399	3	15.2	−57.7	1	15.7	−63.0	5	16.3	−67.2	3	16.6	−69.7	3	15.1	−59.0	3	15.3	−60.0	1	16.4	−66.0	1	16.0	−62.0
400–409	2	15.8	−59.5	6	16.5	−63.0	4	16.9	−66.2	1	17.2	−69.0	1	15.9	−61.0	4	16.0	−59.5	1	16.2	−62.0	2	16.4	−61.5
Weighted means		11.8	−53.4		13.3	−58.7		13.5	−59.2		13.1	−58.4		11.8	−55.0		12.0	−54.5		12.7	−56.9		12.1	−55.4
Mean potential temperature ° A. (weighted)		346.2			356.7			358.3			354.9			344.1			348.1			350.2			345.4	
Number days with observations		29			27			25			17			26			26			25			27	

[1] In or near the 5 square: Lat. 35°00′ N. to 40°00′ N. Long. 55°00′ to 60°00′ W.
[2] In or near the 5 square: Lat. 40°00′ N. to 45°00′ N. Long. 40°00′ W. to 45°00′ W.

WEATHER ON THE NORTH ATLANTIC OCEAN

By H. C. HUNTER

Atmospheric pressure.—The pressure averaged somewhat above normal over the southeastern portion but near normal over the southwestern. A considerable deficiency appears near the coasts of New England and Nova Scotia, where the last week of the month was marked by quite low pressure for the season.

The extremes of pressure in available vessel reports were 1034.9 and 992.6 millibars (30.56 and 29.31 inches). The high mark was noted near 45° N., 45° W., during the afternoon of the 21st, on the American steamship *Gateway City*. In the very same part of the ocean (44° N., 43° W.) the low reading was made very clearly on the 6th, by the American liner *President Roosevelt*. Table 1 shows that a lower pressure was noted on the 14th at Belle Isle, Newfoundland.

TABLE 1.—*Averages, departures, and extremes of atmospheric pressure (sea level) at selected stations for the North Atlantic Ocean and its shores, June 1940*

Station	Average pressure	Departure from normal	Highest	Date	Lowest	Date
	Millibars	*Millibars*	*Millibars*		*Millibars*	
Lisbon	1,017.6	+0.7	1,025	26	1,009	23
Horta	1,025.0	+1.0	1,032	12, 17	1,015	6, 27
Belle Isle, Newfoundland [1]	1,010.6	−0.6	1,023	8, 10, 22	982	14
Halifax, Nova Scotia	1,012.1	−2.8	1,026	10	1,001	29
Nantucket	1,012.9	−2.3	1,027	17	998	26
Hatteras	1,015.6	−0.7	1,024	22	1,002	25
Turks Island	1,016.8	−0.1	1,020	13	1,012	20
Key West	1,015.9	+0.3	1,021	27	1,013	25
New Orleans	1,015.2	0.0	1,021	30	1,010	16

[1] For 23 days.

NOTE.—All data based on available observations, departures compiled from best available normals related to time of observation, except Hatteras, Key West, Nantucket, and New Orleans, which are 24-hour corrected means.

Cyclones and gales.—There was little of note in the matter of high winds. The middle portion of the month, from 10th to 21st, was particularly quiet.

On the 3d a well-marked LOW was central nearly over Labrador, advancing eastward. A trough was developing to southward of the center, and by the evening of the 4th was of considerable strength, with well-marked center near 45° N., 45° W. There was little change in location of this center until the 6th, when it began to move with moderate speed toward the east-northeast, but with decreasing energy. Several vessels met fresh to strong gales in connection with this LOW system.

On the evening of the 21st a cyclone of moderate strength was centered over Labrador with a trough developing to the southward. Within this trough a well-marked center formed by the morning of the 22d when it was located about 39° N., 59° W. From this position it traveled toward the northwest till it was over New Brunswick on the evening of the 23d, but thereafter it advanced eastward, passing near Cape Race on the 25th and being near mid-ocean at about latitude 50° N., on the 27th. As with the LOW system during the early portion of the month, there were several reports of vessels meeting fresh to strong gales.

Fog.—To the southward of the 35th parallel of latitude, where fog rarely forms at this season, there was no fog reported, save a very little during the early days of the month, at a short distance off the Carolina coast. Over the waters from Hatteras to Nova Scotia there was usually somewhat more fog than the average June amount for past years, but comparatively little was recorded after the 20th. The 5° square, 40° to 45° N., 65° to 70° W., had fog on 15 days, a number not equaled by any other North Atlantic region, so far as reports indicate.

To the southeastward and eastward of Nova Scotia, as far as the eastern limits of the Grand Banks, the reports available establish but few occurrences of fog, very many less than the June averages of earlier years; this relative scarcity of fog reports seems, however, to be in considerable measure due to the diminished number of vessels now reporting for this area.

Between the southeastern edge of the Grand Banks and the eastern Azores there was a little fog, mainly between the 8th and 11th or else during the final days of June. To northward of the 45th parallel and to eastward of the 40th meridian scarcely any fog is known to have occurred; however, there have been but few vessels sending reports for this part of the ocean.

OCEAN GALES AND STORMS, JUNE 1940

Vessel	Voyage		Position at time of lowest barometer		Gale began June	Time of lowest barometer June	Gale ended June	Lowest barometer	Direction of wind when gale began	Direction and force of wind at time of lowest barometer	Direction of wind when gale ended	Direction and highest force of wind	Shifts of wind near time of lowest barometer
	From—	To—	Latitude	Longitude									
NORTH ATLANTIC OCEAN			° ′	° ′				*Millibars*					
Pan Royal, Am. S. S.	Gibraltar	Dingwall, N. S.	[1]40 45 N.	45 10 W.	4	6p, 4	4	998.6	SSW	W, 5	W	SE, 9	SE-W-NNW.
Capulin. Am. S. S.	Bilbao	New York	42 24 N.	40 42 W.	5	10a, 5	6	1,002.4		W, 8		W, 8	SW-W.
President Roosevelt, Am. S. S.	Galway	do	44 12 N.	42 42 W.	6	3a, 6	6	992.6	W	WSW, 6	W	W, 8	WSW-W.
Pontchartrain, U. S. C. G.	On Station #1	Out from New York.	38 36 N.	58 48 W.	9	5p, 7	9	[2]1,005.1	NNW	W, 4	NNW	NNW, 8	WNW-S.
Bibb, U. S. C. G.	do	Out from Norfolk.	38 36 N.	58 48 W.	21	7a, 22	22	1,009.8	SSE	NNW, 8	NNW	S, 9	S-NNW.
Mosfruit, Nor. M. S.	Liverpool	New York	55 21 N.	06 10 W.	22	12m, 22	22	999.5		NNW, 5		N, 8	
Duane, U. S. C. G.	On Station #2	Out from Boston.	40 18 N.	44 00 W.	25	8p, 25	25	1,004.1	S	S, 8	WSW	S, 8	S-W.
Mosfruit, Nor. M. S.	Liverpool	New York	46 05 N.	36 31 W.	26	6p, 26	27	998.2		SW, 8	W	W, 8	SW-WSW.
Examiner, Am. S. S.	Lisbon	do	42 36 N.	28 48 W.	27	11p, 27	27	1,010.8	WSW	W, 6	W	WSW, 8	
Bibb, U. S. C. G.	On Station #1	Out from Norfolk.	39 06 N.	59 06 W.	29	2p, 30	[3]2	1,017.3	SW	SW, 9	SW	SSW, 10	SSW-WSW.
Steel Scientist, Am. S. S.	Cristobal	Boston	12 22 N.	78 15 W.	30	6p, 30	[3]2	1,008.5	NE	NE, 7	E	ENE, 8	NE-ENE.
NORTH PACIFIC OCEAN													
Yamahagi Maru, Jap. S. S.	Yokohama	Seattle	40 56 N.	150 32 E.	4	12m, 3	5	999.0	NW	NW, 3		NW, 8	
W. S. Miller, Am. S. S.	San Francisco	do	39 00 N.	124 06 W.	4	6p, 4	6	1,012.2	NW	NW, 8	N	NW, 9	None.
Manulani, Am. S. S.	do	Honolulu	37 00 N.	125 12 W.	5	9a, 5	5	1,018.0		NNW, 9	NNW	NNW, 10	
Daiiti Ogura Maru, Jap. M. S.	Yokohama	Port San Luis	42 06 N.	147 42 W.	11	2a, 11	11	982.7		W, 2		WNW, 8	E-W.
Texas, Am. S. S.	Hakodate	Coos Bay, Oreg.	45 30 N.	133 18 W.	10	3p, 11	11	1,004.4	SE	SE, 7	SE	SE, 8	
Hoegh Silverstar, Nor. M. S.	Cebu, P. I.	Los Angeles	16 22 N.	133 00 E.	14	2p, 14	14	1,003.0	S	S, 7	S	S, 7	
Winona, Am. S. S.	Los Angeles	Balboa	17 24 N.	101 54 W.	18	4a, 18	18	985.1	NNE	Calm	WSW	SW, 12	NNE-calm-SW.
La Placentia, Am. S. S.	Port San Luis	do	17 36 N.	102 18 W.	18	4a, 18	18	979.0	WNW	Calm	WSW	N, 12	N-calm-SSE.
Collingsworth, Am. S. S.	Yokohama	Seattle	48 24 N.	176 00 E.	17	8p, 18	19	976.0	S	E, 4	S	ESE, 8	E-S.
Maliko, Am. S. S.	Honolulu	San Francisco	[1]37 40 N.	122 59 W.	20	12m, 21	21	1,012.9	N	NW, 6	NW	N, 8	None.
Huguenot, Am. S. S.	Los Angeles	Seattle	39 30 N.	124 18 W.	26	4a, 26	27	1,013.5	NW	NW, 7	N	NW, 9	
Norfolk Maru, Jap. S. S.	Kobe	Victoria, B. C.	48 30 N.	178 36 W.	27	12p, 26	28	[2]1,013.9		SE, 8	E	SE, 8	
Chateau Thierry, U. S. A. T.	Honolulu	San Francisco	[1]36 57 N.	124 53 W.	26	2a, 28	28	1,012.9	N	NW, 5	NW	NNW, 8	NNW-NW.

[1] Position approximate. [2] Barometer uncorrected. [3] July.

WEATHER ON THE NORTH PACIFIC OCEAN

By WILLIS E. HURD

Atmospheric pressure.—Little change occurred in the general pressure situation over the North Pacific Ocean in June as compared with that of May. The Aleutian LOW continued in northern waters, with average barometer of 1,008.8 millibars (29.77 inches) at Dutch Harbor. This reading is −3.7 millibars (−0.11 inch) below the normal of the month.

A wide band of high average pressure extended along the coast from southeastern Alaska to Oregon and southwestward two-thirds across the ocean. At both Midway Island and Tatoosh Island, within this belt, the average pressures were 2.7 and 3.7 millibars (0.08 and 0.11 inch), respectively, above their June normals.

Low pressure from Asia overspread Far Eastern waters, but with averages above normal at Manila and Naha, and below normal at Guam.