AEROLOGICAL OBSERVATIONS

[Aerological Division, D. M. LITTLE in charge]

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February was characterized by above-normal surface temperatures over the western half of the United States and excessive precipitation along the Pacific slope. The northerly winds and abnormal cold of January were replaced by higher temperatures generally and more southerly wind directions during the current month. In the lower levels of the upper air, the monthly mass movement of the atmosphere was somewhat unusual, changing from southerly and southwesterly winds over the Pacific coast and far Northwest to westerly and northwesterly winds over the northern and eastern sections (chart VIII). At the higher levels, as shown on charts IX, X, and XI, as well as in table 2, resultant winds were westerly and northwesterly at most pilot-balloon stations.

The current month was outstandingly wet over much of the United States, particularly in the West and over the Pacific coast. Resultant winds from the southwest quadrant occurred in the lower levels over northern California, Oregon, and Washington. These winds, together with the seasonal position of the Aleutian LOW and frequent masses of greatly modified Polar Pacific and Tropical Pacific air, were directly associated with the excess precipitation on the coastal slope that occurred throughout the month, and which condition is indicated on the isentropic chart for February (chart XII). These resultant-wind directions were oriented considerably south of the February normals, but the resultant velocities were greater than normal.

Mean upper-air pressures were highest at 5,000 feet (chart VIII) over the southern Rocky Mountains, and lowest to the northeast of the United States. High mean pressure existed over the South at all standard levels. The mean pressures for February were higher than those recorded during the preceding month in all sections east of the Divide. Northern radiosonde stations showed the greatest difference in pressure between the two months, while the southern stations were nearly identical at both periods. Gradient pressure differences between the HIGH and LOW areas (Miami, Fla., and Sault Ste. Marie, Mich., respectively) increased sharply with altitude, becoming 32 millibars at 8 kilometers, and then decreasing steadily.

High relative humidity was concentrated over the Pacific northwest at all levels above the surface. Elsewhere, the percentages of humidity were not unusual, and the lowest occurred over El Paso, Tex., in the lower levels, and over Miami, Fla.,in the upper levels.

Over the Pacific slope mean temperatures in the upper air showed that San Diego and Oakland, Calif., Medford, Oreg., Ely, Nev., and Seattle and Spokane, Wash., were not only relatively cold, but decidedly colder than in the preceding month. Fairbanks, Alaska, within the general source region of the Polar Pacific air masses above mentioned, was comparatively cold at all levels. As shown on charts VIII, IX, X, and XI, the current mean temperatures were lowest at Sault Ste. Marie, Mich.; then over Miami, Fla., at 13 kilometers and above. At 17 kilometers the lowest mean temperature recorded during the month occurred also over Miami, Fla. (−74.4° C.). The mean freezing level (0° C.) for February appeared at the surface north of a line extending approximately from northern Maryland to central Missouri, Nevada, and Montana. The level then sloped up toward the south, and reached 2,000 and 3,000 meters roughly along the thirty-fifth and thirtieth parallels, respectively, and 4,040 meters over Miami, Fla.

Except for the Pacific coast, the resultant winds at 1.5 kilometers departed from normal by turning in clockwise rotations so as to become more northerly. At 3 kilometers the winds became more southerly by counterclockwise orientations, except in the far Southwest. The 5 a. m. velocities at 1.5 and 3 kilometers were less than normal over the North and East, and greater than normal in the South and West.

The 5 p. m. winds became more southerly than morning directions at 1.5 and 3 kilometers over the southern half of the country, and assumed more northerly directions over the northern half. Afternoon velocities were generally lower than those occurring in the morning, except on the Pacific slope at 1.5 kilometers. Winds for the month were highest over the East, reaching 81.5 meters per second over Greensboro, N. C., at 11.4 kilometers, a record for that place.

MONTHLY MEAN ISENTROPIC CHART [1]

On the mean isentropic chart θ-296° (chart XII) for February 1940, it will be seen that the belt of westerlies dominates the entire country, with three moist tongues from the south skirting the southern edge of the westerlies. These three moist tongues, apparently parts of frictionally driven eddies, are associated with the abnormal precipitation over California and Nevada, central Texas and Louisiana, and Florida and the south Atlantic coast. Upslope motion and high humidities are also indicated in the far Northwest, where great excesses in precipitation occurred.

[1] Prepared by the Division of Research and Education.

TABLE 1.—*Mean free-air barometric pressure (P.) in millibars, temperature in ° C., and relative humidities (R. H.) in percent, obtained by airplanes and radiosondes during February 1940*

Stations and elevations in meters above sea level

Altitude (meters) m. s. l.	Albuquerque, N. Mex. (1,620 m.)				Atlanta, Ga. (300 m.)				Billings, Mont. (1,089 m.)				Bismarck, N. Dak. (505 m.)				Boise, Idaho (824 m.)				Buffalo, N. Y. (220 m.)				Charleston, S. C. (14 m.)			
	Number of observations	P.	T.	R. H.	Number of observations	P.	T.	R. H.	Number of observations	P.	T.	R. H.	Number of observations	P.	T.	R. H.	Number of observations	P.	T.	R. H.	Number of observations	P.	T.	R. H.	Number of observations	P.	T.	R. H.
Surface	29	837	3.0	59	29	981	3.5	81	29	889	−3.9	81	29	958	−9.7	92	28	916	2.5	81	29	989	−5.2	89	29	1,015	6.2	78
500					29	957	3.8	78													29	955	−5.6	81	29	957	7.4	65
1,000					29	901	2.9	74					29	899	−8.8	91	28	901	3.5	79	29	896	−7.0	81	29	901	5.2	61
1,500					29	847	2.1	69	29	844	−2.2	75	29	843	−7.2	82	28	847	1.2	74	29	839	−8.2	80	29	847	3.7	56
2,000	29	799	3.0	57	29	795	.8	64	29	792	−3.7	73	29	790	−7.1	75	28	795	−2.3	78	29	787	−9.2	77	29	796	2.2	54
2,500	29	750	−.4	58	29	747	−1.2	59	29	743	−6.3	75	29	741	−8.7	72	28	746	−5.4	81	29	738	−11.0	74	29	748	.5	52
3,000	29	705	−3.7	59	28	701	−3.1	53	29	697	−9.7	78	29	695	−10.9	70	28	700	−8.5	81	29	691	−12.6	72	29	703	−1.9	51
4,000	29	620	−9.7	56	28	617	−8.7	48	29	611	−15.5	76	29	609	−16.7	66	27	615	−14.6	79	29	605	−17.2	68	28	619	−7.3	48
5,000	29	544	−16.4	52	28	542	−15.3	49	29	535	−22.1	74	29	532	−23.3	62	27	538	−21.4	73	28	529	−23.4	65	28	544	−13.0	49
6,000	29	475	−23.1	49	28	474	−22.5	46	29	466	−29.6	72	29	464	−30.6	61	27	469	−28.3	71	28	461	−30.4	63	28	476	−19.9	49
7,000	29	414	−30.1	47	28	413	−29.5	44	28	404	−37.5	70	29	401	−38.7	59	26	407	−36.1	66	28	399	−37.8	61	28	415	−27.3	46
8,000	29	359	−38.0	46	28	358	−36.7	43	28	348	−45.6		27	346	−46.4		26	351	−43.8		28	345	−45.0		28	360	−34.5	45
9,000	29	309	−45.7		28	303	−43.9		28	300	−52.4		26	297	−53.7		26	302	−50.2		27	296	−51.8		28	312	−41.7	
10,000	28	266	−52.1		28	266	−49.9		26	256	−56.6		25	254	−59.2		26	259	−54.5		27	253	−57.3		26	268	−48.4	
11,000	28	228	−55.8		27	228	−54.0		24	219	−57.9		25	216	−60.1		26	222	−56.5		27	216	−57.9		24	230	−53.6	
12,000	28	194	−57.1		26	195	−56.5		21	187	−55.7		25	184	−56.6		25	189	−55.5		25	184	−56.4		24	197	−56.4	
13,000	26	166	−58.3		24	166	−57.9		20	160	−53.7		21	157	−55.0		22	162	−54.7		21	157	−55.3		18	168	−57.9	
14,000	24	141	−59.6		22	141	−59.5		16	136	−54.1		21	134	−55.3		20	138	−54.7		16	134	−56.1		18	142	−60.5	
15,000	22	120	−62.0		19	120	−61.1		14	116	−55.2		17	115	−56.0		18	118	−55.7		12	114	−57.6		13	121	−62.6	
16,000	19	102	−64.2		18	102	−63.1		11	99	−56.1		8	98	−57.4		14	102	−56.5		6	97	−58.5		12	103	−65.0	
17,000	15	86	−64.9		12	87	−63.7		6	85	−56.7						9	86	−57.6						8	87	−66.5	
18,000	9	73	−63.7																						5	73	−66.1	

Stations and elevations in meters above sea level

Altitude (meters) m. s. l.	Dayton, Ohio [1] (250 m.)				Denver, Colo. (1,616 m.)				El Paso, Tex. (1,193 m.)				Ely, Nev. (1,908 m.)				Fairbanks, Alaska (153 m.)				Joliet, Ill. (178 m.)				Juneau, Alaska (49 m.)			
	Number of observations	P.	T.	R. H	Number of observations	P.	T.	R. H.	Number of observations	P.	T.	R. H.	Number of observations	P.	T.	R. H.	Number of observations	P.	T.	R. H.	Number of observations	P.	T.	R. H.	Number of observations	P.	T.	R. H.
Surface	24	988	−1.6	82	29	835	−1.7	74	29	882	7.7	49	29	808	−1.6	82	28	994	−13.9	69	26	996	−3.4	89	28	1,006	0.2	60
500	24	957	−2.1	85													28	951	−9.7	70	26	956	−4.0	84	28	951	−1.8	61
1,000	24	899	−3.9	85													28	892	−7.5	68	26	897	−5.1	79	28	893	−4.6	60
1,500	23	843	−4.9	81					29	850	9.4	47					28	836	−8.5	67	26	842	−4.8	71	28	838	−7.0	61
2,000	23	791	−6.1	77	29	796	.2	68	29	800	6.2	46	29	798	−1.2	79	28	783	−10.7	64	26	790	−5.9	69	28	786	−9.2	62
2,500	23	742	−7.8	73	29	747	−2.0	63	29	752	3.0	44	29	750	−3.5	78	28	734	−13.4	60	26	741	−8.0	70	28	736	−11.1	60
3,000	22	695	−9.8	67	29	701	−5.0	60	29	707	−.2	44	29	703	−6.6	79	28	687	−16.5	57	26	694	−10.3	70	28	689	−14.1	57
4,000	18	610	−14.6	64	28	617	−12.0	60	29	623	−6.4	41	29	618	−12.1	75	28	600	−23.4	53	26	609	−15.6	64	28	603	−20.9	54
5,000	14	534	−19.8	62	28	541	−18.4	60	29	547	−12.7	37	29	542	−18.8	70	28	522	−30.8	51	26	532	−21.9	62	26	526	−27.9	53
6,000	9	466	−25.9	62	28	472	−25.4	59	28	479	−19.6	34	29	473	−25.9	65	28	453	−37.7	51	26	464	−28.9	60	26	457	−35.6	51
7,000					28	410	−33.4	58	28	418	−27.3	34	29	411	−33.2	64	27	391	−44.7		25	403	−36.3	59	26	395	−42.9	
8,000					28	355	−41.0		28	363	−35.1	35	28	356	−40.7		27	336	−51.0		25	348	−43.4		26	340	−49.7	
9,000					27	306	−48.3		28	314	−42.1		28	307	−48.0		24	287	−55.6		22	300	−50.0		25	292	−54.0	
10,000					23	262	−53.5		28	270	−48.5		28	263	−54.2		21	245	−56.3		19	256	−55.3		25	250	−54.6	
11,000					21	225	−56.5		27	232	−53.7		27	225	−58.2		17	210	−54.2		17	219	−57.1		21	214	−52.7	
12,000					18	192	−55.2		27	198	−56.1		25	192	−57.4		16	179	−51.2		17	186	−56.2		18	184	−50.9	
13,000					17	164	−55.4		27	169	−58.2		23	164	−57.4		10	153	−49.3		15	159	−55.3		15	158	−49.2	
14,000					15	140	−55.9		26	144	−60.0		20	140	−58.0		9	131	−48.4		12	136	−55.0		14	136	−49.4	
15,000					12	120	−57.5		25	122	−62.7		19	119	−59.6		6	113	−48.6		10	116	−56.0		9	117	−50.3	
16,000					9	102	−59.1		21	104	−65.5		16	102	−61.0						8	99	−56.9		5	100	−50.7	
17,000					5	87	−58.6		16	88	−66.1		9	87	−61.1						5	84	−57.0					
18,000									10	74	−65.8																	

Stations and elevations in meters above sea level

Altitude (meters) m. s. l.	Lakehurst, N. J. [2] (39 m.)				Medford, Oreg. (401 m.)				Miami, Fla. (4 m.)				Minneapolis, Minn. (263 m.)				Nashville, Tenn. (180 m.)				Norfolk, Va. [3 4] (10 m.)				Oakland, Calif. (2 m.)			
	Number of observations	P.	T.	R. H.	Number of observations	P.	T.	R. H.	Number of observations	P.	T.	R. H.	Number of observations	P.	T.	R. H.	Number of observations	P.	T.	R. H.	Number of observations	P.	T.	R. H.	Number of observations	P.	T.	R. H.
Surface	29	1,009	−2.0	77	28	967	6.2	87	29	1,018	13.9	89	29	987	−7.3	83	29	995	2.9	81	15	1,019	2.3	75	29	1,017	11.6	83
500	29	952	−2.9	73	28	956	6.4	84	29	960	14.3	78	29	958	−6.5	81	29	956	1.9	81	15	960	2.6	69	29	958	9.6	80
1,000	29	894	−3.4	68	28	899	5.6	76	29	905	11.5	77	29	898	−7.7	80	29	899	.6	78	15	902	.8	64	29	902	7.0	77
1,500	28	838	−4.5	62	28	845	2.6	76	29	852	9.5	70	29	842	−7.8	78	29	845	−.2	71	14	847	−.8	58	29	848	4.3	75
2,000	28	787	−5.8	58	28	794	−.7	78	29	802	8.9	53	29	790	−8.3	73	29	793	−1.7	68	14	796	−2.1	50	29	798	1.9	71
2,500	28	738	−7.6	60	28	746	−3.5	77	29	755	7.3	47	29	740	−9.3	69	29	745	−3.7	65	14	747	−3.9	45	29	749	−.4	67
3,000	28	692	−9.6	61	28	700	−6.5	74	29	710	5.1	41	29	694	−11.2	65	27	699	−6.0	64	14	700	−6.2	42	29	704	−3.2	66
4,000	28	607	−14.8	60	28	615	−12.2	72	29	628	.2	31	29	608	−16.6	61	26	614	−11.0	61	13	616	−11.2	37	29	620	−9.0	63
5,000	28	531	−21.0	60	27	539	−18.7	66	29	554	−6.2	29	29	532	−23.0	57	25	539	−17.2	60	11	540	−17.3	36	29	544	−15.4	61
6,000	28	462	−27.8	64	25	471	−26.1	63	29	486	−13.0	29	27	463	−30.6	54	25	471	−23.9	58					29	475	−22.2	59
7,000	28	401	−35.4	67	23	409	−33.9	61	29	426	−19.6	30	26	402	−38.7	53	25	409	−31.3	55					29	414	−29.9	56
8,000	27	347	−42.8		20	354	−41.5		29	372	−26.5	30	26	346	−45.9		24	354	−38.7	53					29	359	−37.8	56
9,000	27	298	−49.4		17	304	−48.6		28	322	−34.0	29	26	298	−52.6		24	306	−45.7						29	310	−45.7	
10,000	26	256	−54.4		15	261	−53.7		28	279	−41.9		26	254	−57.3		23	262	−51.0						29	266	−52.8	
11,000	24	219	−56.7		14	223	−56.1		28	240	−49.4		24	218	−57.3		23	225	−55.4						29	228	−57.7	
12,000	23	187	−54.8		8	190	−57.0		27	206	−55.5		20	186	−55.1		23	192	−56.3						27	194	−59.8	
13,000	20	161	−54.1		6	162	−57.3		27	175	−60.3		18	160	−54.1		22	164	−56.4						26	165	−59.8	
14,000	19	137	−55.0		5	138	−55.7		27	149	−64.6		16	137	−55.2		19	140	−57.6						25	141	−59.2	
15,000	14	118	−56.2						27	126	−69.0		15	117	−55.9		17	120	−59.0						25	119	−60.6	
16,000	11	100	−57.6						27	106	−72.2		11	100	−56.9		10	102	−60.6						22	102	−62.0	
17,000	9	84	−58.2						24	90	−74.4		6	86	−57.1		8	87	−61.7						21	86	−62.5	
18,000	5	72	−58.0						22	75	−73.5						5	74	−61.2						17	73	−62.2	
19,000									14	63	−70.7														8	62	−61.8	
20,000									5	53	−65.5																	

See footnotes at end of table.

TABLE 1.—*Mean free-air barometric pressure (P.) in millibars, temperature in ° C., and relative humidities (R. H.) in percent obtained by airplanes and radiosondes during February 1940*—Continued

Stations and elevations in meters above sea level

Altitude (meters) m s. l.	Oklahoma City, Okla. (391 m.)				Omaha, Nebr. (301 m.)				Pearl Harbor, T. H.[1 2] (6 m.)				Pensacola, Fla.[2] (24 m.)				Phoenix, Ariz. (339 m.)				St. Louis, Mo. (171 m.)				San Antonio, Tex. (174 m.)			
	Number of observations	P.	T.	R. H.	Number of observations	P.	T.	R. H.	Number of observations	P.	T.	R. H.	Number of observations	P.	T.	R. H.	Number of observations	P.	T.	R. H.	Number of observations	P.	T.	R. H.	Number of observations	P.	T.	R. H.
Surface	29	970	2.7	82	29	982	−5.3	90	29	1,015	19.2	88	28	1,016	9.5	78	29	976	11.0	55	29	997	−0.3	81	29	997	10.4	79
500	29	956	3.4	81	29	958	−4.4	88	29	959	18.6	78	28	959	7.9	72	29	958	14.2	53	29	956	−1.8	80	29	959	11.3	75
1,000	29	900	3.4	71	29	899	−3.3	79	29	905	14.8	81	28	902	6.4	65	29	903	12.0	50	29	898	−2.7	77	29	902	9.6	72
1,500	29	846	2.8	64	29	844	−2.6	69	29	854	12.5	72	28	849	5.0	55	29	850	8.3	50	29	843	−2.3	72	29	850	8.1	67
2,000	29	795	1.2	60	29	792	−3.9	67	29	804	11.7	48	28	799	3.6	46	29	800	4.8	49	29	792	−4.0	69	29	800	6.5	60
2,500	29	747	−1.5	58	29	743	−6.0	65	29	756	9.8	33	28	751	1.5	44	29	752	2.0	48	29	743	−5.9	67	29	752	4.3	54
3,000	29	701	−3.7	57	29	697	−8.5	63	29	712	7.2	24	28	705	−.5	44	29	706	−.4	47	29	697	−8.5	66	29	707	1.8	49
4,000	28	617	−9.3	55	29	612	−14.0	62	28	630	1.6	18	28	622	−5.8	46	29	623	−6.2	45	29	612	−13.7	64	29	624	−4.6	44
5,000	28	542	−15.7	52	29	536	−20.2	62	----	----	----	----	27	547	−11.7	46	29	547	−12.9	43	29	535	−20.0	61	29	549	−10.8	41
6,000	28	473	−23.2	52	29	467	−27.0	60	----	----	----	----	27	479	−18.1	47	29	479	−19.9	43	28	467	−26.7	59	29	481	−18.0	38
7,000	28	412	−30.9	51	28	406	−34.7	58	----	----	----	----	25	418	−25.1	50	29	418	−27.6	42	28	406	−34.1	56	29	420	−25.3	38
8,000	28	358	−38.5	50	28	351	−42.6	----	----	----	----	----	25	363	−32.2	52	28	363	−35.3	41	28	351	−41.3	----	29	365	−32.9	38
9,000	27	308	−46.0	----	28	302	−50.1	----	----	----	----	----	23	315	−39.0	56	28	314	−42.9	----	28	302	−48.5	----	29	316	−39.7	37
10,000	27	264	−52.6	----	28	258	−56.3	----	----	----	----	----	23	272	−45.2	----	26	270	−50.1	----	28	259	−54.3	----	29	272	−46.1	----
11,000	26	226	−55.8	----	28	221	−58.6	----	----	----	----	----	22	234	−50.6	----	24	231	−55.9	----	28	222	−57.9	----	28	234	−50.7	----
12,000	26	193	−56.5	----	27	188	−56.5	----	----	----	----	----	18	200	−54.8	----	23	197	−59.0	----	27	189	−57.1	----	27	200	−54.0	----
13,000	25	165	−56.9	----	25	161	−55.3	----	----	----	----	----	14	170	−58.4	----	18	168	−60.4	----	27	161	−56.6	----	23	171	−57.5	----
14,000	20	141	−58.1	----	24	137	−55.6	----	----	----	----	----	13	144	−61.2	----	15	142	−61.0	----	26	138	−57.7	----	22	146	−60.0	----
15,000	19	120	−60.4	----	21	117	−57.2	----	----	----	----	----	10	123	−63.9	----	12	121	−63.5	----	23	117	−59.3	----	22	124	−63.1	----
16,000	15	102	−62.9	----	20	100	−58.7	----	----	----	----	----	8	104	−66.5	----	9	103	−65.5	----	19	100	−60.1	----	19	106	−65.7	----
17,000	9	87	−63.7	----	12	86	−59.5	----	----	----	----	----	6	88	−69.7	----	7	87	−67.0	----	14	85	−60.3	----	13	90	−67.2	----
18,000	5	74	−61.1	----	9	73	−59.5	----	----	----	----	----	----	----	----	----	----	----	----	----	5	72	−60.2	----	10	76	−66.9	----
19,000	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	5	64	−67.1	----

Stations and elevations in meters above sea level

Altitude (meters) M. S. L.	San Diego, Calif.[2] (19 m.)				S. Ste. Marie, Mich. (221 m.)				Seattle, Wash.[1] (27 m.)				Shreveport, La.[4] (51 m.)				Spokane, Wash. (598 m.)				Washington, D. C.[2] (7 m.)			
	Number of observations	P.	T.	R. H.	Number of observations	P.	T.	R. H.	Number of observations	P.	T.	R. H.	Number of observations	P.	T.	R. H.	Number of observations	P.	T.	R. H.	Number of observations	P.	T.	R. H.
Surface	28	1,015	13.6	84	29	992	−8.6	81	26	1,009	7.0	84	21	1011	7.3	82	29	944	1.1	88	28	1,014	0.8	73
500	28	958	12.1	70	29	957	−9.2	86	26	953	5.5	79	21	958	6.8	82	----	----	----	----	28	954	.4	64
1,000	28	902	9.4	69	29	897	−11.1	87	26	896	2.5	79	21	902	6.1	78	29	898	.4	87	28	896	−.6	65
1,500	28	849	6.6	63	29	840	−12.4	83	26	842	−.6	79	21	848	5.6	72	29	843	−1.7	84	28	842	−2.2	53
2,000	28	799	4.1	55	29	786	−13.0	81	25	791	−3.8	78	20	798	4.0	67	29	791	−4.7	81	28	791	−4.0	63
2,500	28	751	1.9	51	29	736	−14.5	78	25	742	−6.9	76	20	750	1.8	64	28	742	−7.8	79	28	742	−5.8	66
3,000	28	705	−.2	50	29	689	−16.2	75	25	695	−9.8	74	18	704	−.5	62	28	696	−11.0	76	28	695	−8.0	71
4,000	27	621	−5.8	47	29	602	−21.4	71	24	610	−16.2	70	16	622	−5.7	58	28	610	−17.2	69	28	611	−13.2	67
5,000	26	546	−12.0	47	29	525	−27.3	69	23	533	−22.7	70	14	547	−11.7	56	28	533	−24.5	67	28	534	−19.2	63
6,000	26	478	−18.9	50	29	456	−33.9	68	21	464	−29.9	72	11	479	−17.7	54	28	464	−32.0	65	28	466	−26.0	67
7,000	26	418	−25.9	57	29	395	−41.0	----	19	403	−37.7	75	9	419	−23.9	53	28	401	−39.7	64	27	405	−33.7	71
8,000	25	363	−33.3	68	29	340	−47.9	----	16	348	−44.3	----	7	365	−31.6	48	28	346	−47.2	----	26	350	−41.3	----
9,000	24	315	−40.8	67	28	292	−53.8	----	14	300	−50.6	----	6	316	−39.2	----	27	297	−52.9	----	25	301	−48.3	----
10,000	22	271	−48.2	----	26	249	−56.5	----	12	257	−54.2	----	5	272	−46.7	----	27	254	−55.7	----	20	258	−54.4	----
11,000	22	233	−55.2	----	25	213	−56.0	----	9	220	−56.0	----	5	233	−53.2	----	27	217	−55.3	----	14	220	−58.9	----
12,000	21	198	−60.3	----	24	182	−54.1	----	7	188	−53.8	----	----	----	----	----	27	186	−54.1	----	10	188	−57.5	----
13,000	19	169	−62.5	----	21	156	−53.7	----	7	161	−53.7	----	----	----	----	----	24	159	−53.2	----	8	160	−57.9	----
14,000	12	144	−64.3	----	19	133	−53.7	----	6	138	−54.5	----	----	----	----	----	23	136	−53.9	----	7	136	−59.4	----
15,000	11	122	−66.3	----	10	114	−54.8	----	----	----	----	----	----	----	----	----	16	116	−54.6	----	----	----	----	----
16,000	8	104	−68.5	----	5	97	−55.5	----	----	----	----	----	----	----	----	----	15	99	−55.3	----	----	----	----	----
17,000	5	88	−69.3	----	----	----	----	----	----	----	----	----	----	----	----	----	7	85	−56.1	----	----	----	----	----

[1] U. S. Army, Patterson Field (Fairfield), Ohio.
[2] U. S. Navy.
[3] Airplane observations.
[4] U. S. Army, Barksdale, Field La.

NOTE.—All observations taken at 1 a. m., 75th meridian time, except those at Washington, D. C., Lakehurst, N. J., Norfolk, Va., and Pensacola, Fla., where they are taken before 5 a. m., 75th meridian time. At Pearl Harbor, T. H., observations are taken after sunrise.

None of the means included in this table are based on less than 15 surface or 5 standard level observations.

Number of observations refers to pressure only as temperature and humidity data are missing for some observations at certain levels; also, the humidity data are not used in daily observations when the temperature is below −40.0° C.

TABLE 2.—*Free-air resultant winds based on pilot-balloon observations made near 5 p. m. (75th meridian time) during February 1940*

[Directions given in degrees from north (N=360°, E=90°, S=180°, W=270°). Velocities in meters per second]

Altitude (meters) m. s. l.	Abilene, Tex. (537 m.)			Albuquerque, N. Mex. (1,554 m.)			Atlanta, Ga. (299 m.)			Billings, Mont. (1,095 m.)			Bismarck, N. Dak. (512 m.)			Boise, Idaho (870 m.)			Brownsville, Tex. (7 m.)			Buffalo, N. Y. (220 m.)			Burlington, Vt. (132 m.)			Charleston, S. C. (18 m.)		
	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity
Surface	25	241	2.5	28	287	2.8	28	266	2.4	28	299	1.6	28	331	0.9	26	102	0.8	28	174	2.4	25	288	2.6	28	332	1.4	28	245	2.6
500							28	253	3.6										28	183	2.8	25	267	4.0	28	316	2.3	28	240	4.8
1,000	25	241	3.1				25	248	5.5				25	289	2.2	26	112	1.0	26	239	2.7	17	294	4.9	25	304	3.9	27	256	6.9
1,500	23	253	5.5				20	268	5.1	28	265	3.7	17	299	4.6	26	227	2.9	24	283	5.3	13	328	6.3	20	318	5.1	25	257	7.8
2,000	22	271	8.4	28	284	3.9	17	279	7.7	26	264	7.6	11	293	8.3	25	254	5.1	20	294	8.8	12	316	8.3	16	332	6.1	16	264	8.7
2,500	22	279	10.7	28	286	4.8	16	287	10.8	25	275	9.0	10	304	9.6	20	271	8.2	17	285	11.6	11	314	8.9	13	320	7.5	15	265	11.0
3,000	21	280	12.3	27	294	7.8	16	283	12.6	23	265	9.1				17	278	8.2	15	285	12.4	10	309	8.5				10	285	14.5
4,000	19	280	16.2	19	296	13.4	14	289	17.8	20	280	11.6							13	279	14.4									
5,000	17	280	18.8	16	290	18.4	12	287	23.5	16	280	15.5							13	280	19.7									
6,000	14	273	21.4	15	289	22.6	12	286	26.5	15	284	15.5							13	276	24.1									
8,000	11	270	32.6	11	293	30.4				10	305	25.0							11	267	25.3									

Altitude (meters) m. s. l.	Chicago, Ill. (192 m.)			Cincinnati, Ohio (157 m.)			Denver, Colo. (1,627 m.)			El Paso, Tex. (1,196 m.)			Ely, Nev. (1,910 m.)			Grand Junction, Colo. (1,413 m.)			Greensboro, N. C. (271 m.)			Havre, Mont. (766 m.)			Jacksonville, Fla. (14 m.)			Las Vegas, Nev. (570 m.)		
	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity
Surface	23	293	1.4	27	258	0.8	28	63	1.0	29	261	2.8	25	201	1.1	26	324	1.3	26	266	2.5	23	316	0.4	28	246	1.1	29	81	0.8
500	23	283	1.8	27	271	1.5													26	256	3.6				28	257	4.1			
1,000	16	278	2.2	17	210	2.3													25	272	5.2	23	245	2.2	26	261	5.8	29	136	.7
1,500	14	295	2.8	15	272	4.6				29	270	4.3							25	285	6.6	23	269	6.2	24	272	7.3	29	215	1.6
2,000	10	310	4.3	11	283	6.6	28	317	1.3	29	268	5.3	25	208	1.2	26	357	.3	22	293	9.8	21	272	7.8	23	276	8.7	28	251	2.4
2,500	10	300	5.8	11	284	8.8	28	301	2.9	29	272	8.1	25	233	2.7	25	239	1.6	20	292	11.4	20	268	9.0	22	274	11.3	24	290	4.3
3,000							26	299	6.0	28	273	10.3	24	263	4.2	25	251	4.4	18	295	14.2	17	269	8.7	21	273	12.7	23	293	6.5
4,000							23	304	9.3	24	278	13.4	19	298	10.9	20	273	9.5	16	282	17.0	11	269	10.9	18	281	17.7	23	299	10.2
5,000							22	304	13.6	18	281	15.7	10	307	14.1	14	280	14.2	15	287	24.5				17	284	21.0	21	291	14.4
6,000							20	297	16.7	15	292	18.9							15	281	27.5				13	284	27.7	18	296	19.1
8,000							15	289	24.5										11	278	33.6									

Altitude (meters) m. s. l.	Little Rock, Ark. (79 m.)			Medford, Oreg. (410 m.)			Miami, Fla. (10 m.)			Minneapolis, Minn. (261 m.)			Mobile, Ala. (10 m.)			Nashville, Tenn. (194 m.)			New York, N. Y. (15 m.)			Oakland, Calif. (8 m.)			Oklahoma City, Okla. (402 m.)			Omaha, Nebr. (306 m.)		
	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity
Surface	26	257	0.3	25	286	0.7	29	167	0.7	25	310	0.7	27	217	1.1	17	182	0.4	24	326	5.0	25	245	2.4	22	291	1.6	26	331	1.6
500	26	258	2.1	25	289	.8	29	233	1.1	25	295	.6	27	221	3.5	17	192	1.5	24	321	5.4	25	242	1.9	22	280	1.2	26	336	1.7
1,000	22	244	3.9	25	206	2.0	28	248	2.3	20	220	.2	22	271	4.2	16	217	3.0	23	323	6.8	23	273	2.2	22	267	3.5	18	306	2.4
1,500	16	280	5.7	24	211	5.4	27	251	4.6	16	267	3.2	18	290	6.1	15	257	5.1	21	306	9.6	20	282	2.4	18	274	5.4	15	281	4.8
2,000	14	296	8.0	22	229	6.2	24	258	7.4	16	276	6.4	15	294	6.9	13	281	5.7	17	308	11.2	19	281	2.6	18	277	8.1	14	270	7.2
2,500	14	292	9.3	18	233	7.6	21	268	10.9	13	288	9.8	15	284	9.8	13	288	8.5	12	312	10.1	17	259	4.0	18	288	10.3	13	269	7.9
3,000	12	295	12.3	11	254	5.2	21	261	12.3	12	286	12.2	15	281	12.2	13	295	11.6				15	308	7.3	18	281	11.5	12	279	8.5
4,000	11	291	17.0				20	267	15.6	10	296	15.4	10	275	14.0							13	306	9.8	16	284	13.9	11	295	12.0
5,000							17	273	17.9													11	310	14.0	14	282	17.9	11	301	13.6
6,000							12	272	20.0																13	284	22.6	10	292	19.9

Altitude (meters) m. s. l.	Phoenix, Ariz. (344 m.)			Rapid City, S. Dak. (982 m.)			St. Louis, Mo. (181 m.)			San Antonio, Tex. (183 m.)			San Diego, Calif. (15 m.)			Sault Ste. Marie Mich. (230 m.)			Seattle, Wash. (14 m.)			Spokane, Wash. (603 m.)			Washington, D. C. (10 m.)		
	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity
Surface	28	289	0.9	25	2	3.0	26	268	0.5	27	247	1.9	28	273	2.7	26	7	1.6	23	194	3.3	19	204	0.9	25	317	2.4
500	28	281	1.1				26	262	1.5	27	266	1.6	28	258	2.3	26	360	1.3	23	206	4.7				25	307	4.0
1,000	28	254	1.5	25	2	2.9	19	227	3.2	26	266	2.9	27	248	1.7	22	334	1.4	19	208	7.1	19	190	2.9	20	296	6.3
1,500	27	254	1.7	25	308	4.3	15	263	5.8	22	275	5.1	24	285	1.5	21	332	2.0	13	195	5.7	18	223	4.9	20	294	9.1
2,000	27	274	3.3	20	300	6.8	12	272	8.3	22	276	6.9	24	290	3.7	18	338	3.2	10	221	6.1	14	226	5.7	17	295	10.9
2,500	27	288	5.6	18	303	8.1	10	289	8.3	20	273	9.5	23	288	5.8	15	325	5.8							17	294	11.1
3,000	27	288	7.0	18	298	10.9				19	280	11.2	19	295	8.4	12	299	7.7							16	295	13.8
4,000	25	289	10.0	15	302	13.3				17	279	14.7	16	292	10.9										14	292	17.0
5,000	21	291	13.5	13	294	15.3				14	282	18.9	14	282	11.9												
6,000	11	285	16.5	13	286	16.7				13	281	20.7	13	276	14.2												
8,000				11	294	22.2				12	284	22.9															

TABLE 3.—*Maximum free air wind velocities (M. P. S.), for different sections of the United States based on pilot balloon observations during February 1940*

Section	Surface to 2,500 meters (m. s. l.)					Between 2,500 and 5,000 meters (m. s. l.)					Above 5,000 meters (m. s. l.)				
	Maximum velocity	Direction	Altitude (m.) m. s. l.	Date	Station	Maximum velocity	Direction	Altitude (m.) m. s. l.	Date	Station	Maximum velocity	Direction	Altitude (m.) m. s. l.	Date	Station
Northeast [1]	46.8	NNW	1,280	15	Harrisburg, Pa.	41.2	NW	4,930	26	Kylertown, Pa.	64.0	W	10,930	17	Buffalo, N. Y.
East-Central [2]	44.2	NNW	2,160	14	Greensboro, N. C.	63.9	NW	5,000	14	Greensboro, N. C.	81.5	W	11,360	15	Greensboro, N. C.
Southeast [3]	43.0	WNW	1,730	14	Charleston, S. C.	43.3	WNW	4,380	21	Miami, Fla.	80.1	WSW	10,820	7	Jacksonville, Fla.
North-Central [4]	31.6	N	2,300	2	Sault Ste. Marie, Mich.	45.0	WNW	4,870	22	Fargo, N. Dak.	80.0	WNW	9,830	21	Rapid City, S. Dak.
Central [5]	37.1	S	1,220	23	Springfield, Mo.	60.0	NW	4,960	25	Moline, Ill.	68.4	W	11,070	16	Springfield, Ill.
South-Central [6]	38.2	WNW	1,000	17	Brownsville, Tex.	42.8	W	4,770	13	Abilene, Tex.	70.0	SW	10,990	8	San Antonio, Tex.
Northwest [7]	39.4	WNW	1,570	9	Havre, Mont.	40.7	WNW	4,130	24	Butte, Mont.	80.0	WNW	9,380	21	Billings, Mont.
West-Central [8]	33.8	WNW	2,480	11	Cheyenne, Wyo.	47.0	W	4,140	14	Reno, Nev.	71.0	WNW	10,200	21	Denver, Colo.
Southwest [9]	30.6	N	830	8	Burbank, Calif.	43.1	WNW	2,910	4	El Paso, Tex.	80.0	SSW	9,780	29	Winslow, Ariz.

[1] Maine, Vermont, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, and northern Ohio.
[2] Delaware, Maryland, Virginia, West Virginia, southern Ohio, Kentucky, eastern Tennessee, and North Carolina.
[3] South Carolina, Georgia, Florida, and Alabama.
[4] Michigan, Wisconsin, Minnesota, North Dakota, and South Dakota.
[5] Indiana, Illinois, Iowa, Nebraska, Kansas, and Missouri.
[6] Mississippi, Arkansas, Louisiana, Oklahoma, Texas (except El Paso), and western Tennessee.
[7] Montana, Idaho, Washington, and Oregon.
[8] Wyoming, Colorado, Utah, northern Nevada, and northern California.
[9] Southern California, southern Nevada, Arizona, New Mexico, and extreme west Texas.

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

Potential temperatures, °A.	Albuquerque, N. Mex.			Atlanta, Ga.			Billings, Mont.			Bismarck, N. Dak.			Boise, Idaho			Buffalo, N. Y.			Charleston, S. 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.	Number of cases	Mean altitude (km.) m. s. l.	Mean temperature °C.
290–299							4	7.4	−49.8	4	7.6	−51.8	5	7.5	−51.0	1	7.5	−55.0			
300–309	4	8.0	−48.5	1	6.9	−38.0	16	8.3	−52.0	12	8.0	−49.9	11	8.5	−53.3	9	8.2	−50.6			
310–319	12	9.6	−55.4	7	8.8	−48.4	29	9.5	−55.6	28	9.8	−59.5	16	9.6	−56.5	23	9.6	−57.7	11	8.8	−47.2
320–329	15	10.5	−57.1	24	10.2	−54.3	10	10.7	−61.0	13	10.8	−62.7	17	10.6	−59.0	14	10.7	−61.6	13	10.2	−53.7
330–339	14	11.5	−59.2	16	11.6	−60.3	3	11.8	−64.3	2	11.0	−57.0	8	11.7	−62.6	4	11.1	−57.8	12	11.5	−58.5
340–349	3	12.5	−62.7	5	12.2	−61.0	1	11.1	−56.0				1	11.8	−58.0	1	12.0	−62.0	6	12.3	−60.5
350–359	2	13.2	−64.0	2	13.0	−61.0										1	11.7	−55.0	2	13.0	−60.5
360–369	1	13.8	−61.0	2	13.2	−60.0													2	13.6	−62.5
370–379	1	15.4	−70.0	3	14.3	−62.7										2	13.0	−53.5	1	13.9	−62.0
380–389	6	15.2	−66.3	3	14.6	−58.3										1	13.7	−57.0	4	15.2	−65.2
390–399	1	16.1	−68.0	3	16.1	−68.7				1	14.6	−55.0							4	16.0	−68.2
400–409	3	16.3	−67.3	4	16.0	−64.2	1	14.9	−56.0				1	15.1	−56.0	1	15.2	−56.0	1	16.3	−66.0
Weighted means		11.6	−59.0		11.6	−57.4		9.5	−55.6		9.6	−57.6		9.9	−57.0		10.1	−57.4		13.4	−57.0
Mean potential temperature °A. (weighted)	337.2			340.6			315.1			314.6			318.6			322.6			340.9		

Potential temperatures, °A.	Denver, Colo.			El Paso, Tex.			Ely, Nev.			Fairbanks, Alaska			Joliet, Ill.			Juneau, Alaska			Lakehurst, N. J.		
	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	1	6.5	−43.0				3	6.4	−39.0	10	7.0	−47.3				10	7.3	−50.8			
300–309	11	8.1	−49.6	3	7.9	−46.3	8	7.6	−45.1	30	8.4	−54.5	5	8.2	−50.2	21	8.4	−53.4	5	8.2	−50.4
310–319	10	9.3	−52.3	10	8.6	−44.1	18	9.6	−55.9	11	9.5	−58.0	15	9.4	−53.9	14	9.5	−57.0	11	9.5	−55.6
320–329	19	10.5	−57.9	16	10.6	−56.9	15	11.0	−60.9	5	10.6	−61.4	14	10.3	−59.2	7	10.1	−58.1	12	10.5	−60.3
330–339	5	11.9	−63.2	10	11.4	−58.1	10	11.3	−58.8				4	11.0	−58.2	2	10.6	−56.5	3	11.1	−59.0
340–349	2	12.0	−58.5	12	12.4	−61.3	1	11.5	−57.0				2	12.2	−64.0				1	11.1	−54.0
350–359				4	13.2	−63.2	2	12.9	−59.5												
360–369				1	15.0	−69.0							1	13.1	−58.0						
370–379				3	14.4	−63.0	1	14.1	−62.0												
380–389				7	15.4	−66.6	2	14.6	−60.0												
390–399				7	15.9	−65.7	1	15.4	−63.0										1	15.5	−62.0
400–409	1	16.0	−64.0	3	16.1	−64.7	1	15.6	−60.0										1	15.6	−61.0
Weighted means		10.0	−55.3		12.1	−58.4		10.4	−55.9		8.6	−54.5		9.7	−54.7		8.8	−54.6		10.2	−57.1
Mean potential temperature °A. (weighted)	320.2			346.0			325.7			307.1			321.2			309.2			324.1		

TABLE 4.—*Mean altitudes and temperatures of significant points identifiable as tropopauses during February 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	Miami, Fla.			Minneapolis, Minn.			Nashville, Tenn.			Oakland, Calif.			Oklahoma City, Okla.			Omaha, Neb.			Pensacola, Fla.		
	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				3	7.2	−49.0	1	6.2	−41.0												
300–309				6	8.6	−54.3	1	7.7	−42.0	2	7.7	−44.0	3	8.0	−45.7	3	8.0	−49.3			
310–319	1	7.0	−30.0	19	9.6	−57.5	15	8.9	−48.0	17	9.1	−50.1	21	9.0	−49.4	26	9.6	−55.7	5	8.0	−41.2
320–329	4	10.2	−51.2	11	10.4	−58.9	19	10.6	−56.4	24	10.6	−57.0	17	10.5	−57.4	19	10.8	−60.8	5	9.7	−46.0
330–339	15	11.2	−53.0	3	10.9	−57.3	10	11.6	−60.8	14	12.0	−64.9	14	11.3	−58.1	4	11.4	−62.0	8	11.2	−54.4
340–349	18	12.8	−60.8				1	11.6	−57.0	6	12.1	−59.7	4	12.0	−58.8	1	12.9	−68.0	6	12.3	−59.8
350–359	3	13.6	−64.3				1	12.2	−56.0	2	12.8	−61.0	1	11.8	−52.0				1	13.0	−61.0
360–369	6	14.9	−70.2				1	13.7	−63.0										2	14.3	−66.0
370–379	7	15.6	−72.9							2	13.8	−57.5	3	14.2	−61.7	1	14.1	−60.0	2	14.9	−64.5
380–389	10	16.4	−74.9	1	14.2	−56.0	1	13.5	−54.0				2	15.1	−63.0	1	14.6	−61.0			
390–399	5	16.8	−74.8	2	14.2	−53.5	1	15.7	−63.0	6	15.2	−62.0							1	16.5	−70.0
400–409	10	17.4	−75.6				2	15.6	−60.0	2	16.2	−64.5	2	15.8	−60.5	1	15.3	−57.0	1	16.9	−68.0
Weighted means		14.0	−64.9		9.9	−56.6		10.6	−54.6		11.2	−57.5		10.7	−55.0		10.4	−57.9		11.5	−54.5
Mean potential temperature °A. (weighted)	365.6			320.4			330.5			334.9			330.5			323.1			341.3		

Potential temperatures, °A.	Phoenix, Ariz.			San Antonio, Tex.			San Diego, Calif.			Sault Ste. Marie, Mich.			Spokane, Wash.			St. Louis, Mo.			Washington, D. 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.	Number of cases	Mean altitude (km.) m. s. l.	Mean temperature °C.
290–299										7	6.8	−46.6	3	8.1	−55.0						
300–309	3	7.5	−42.3							14	8.1	−52.4	19	8.4	−52.3	3	8.1	−51.0	5	8.3	−50.4
310–319	8	9.2	−49.5	4	8.4	−43.2	4	8.4	−38.2	31	9.5	−57.7	17	9.6	−57.4	11	9.6	−55.7	7	9.0	−50.6
320–329	20	10.4	−55.1	18	10.0	−49.3	13	10.5	−55.5	12	10.6	−61.4	10	10.6	−59.6	26	10.5	−57.6	12	10.5	−58.6
330–339	11	11.9	−61.5	19	11.0	−52.9	7	11.0	−54.0				2	11.6	−64.0	6	11.6	−62.2	3	11.6	−60.7
340–349	6	12.5	−61.5	7	12.5	−59.9	8	12.1	−58.4	1	11.4	−53.0				2	12.3	−60.0			
350–359	1	12.2	−56.0	5	12.9	−60.2	2	13.2	−63.0							1	12.9	−61.0			
360–369				4	14.2	−65.5	1	13.7	−64.0												
370–379	1	13.7	−61.0	5	15.1	−68.4	1	14.8	−65.0	1	12.7	−52.0				4	14.2	−61.2			
380–389	1	15.7	−67.0	3	15.0	−62.0	1	15.1	−66.0							1	14.8	−62.0			
390–399				7	16.2	−68.4	1	16.1	−70.0							2	15.4	−63.0			
400–409	1	16.9	−70.0	2	17.0	−71.0							1	14.8	−55.0	4	15.6	−62.0	1	15.3	−60.0
Weighted means		10.9	−56.2		12.2	−56.7		11.3	−55.5		9.2	−55.9		9.4	−56.0		11.2	−58.3		10.6	−55.4
Mean potential temperature °A. (weighted)	330.6			347.4			336.6			312.9			314.4			336.0			322.8		

RIVERS AND FLOODS

[River and Flood Division, MERRILL BERNARD in charge]

By BENNETT SWENSON

The precipitation during February was generally above the average over most of the country and decidedly so from the Rocky Mountains westward, except in parts of the far Southwest. It was also well above the normal in much of the Gulf States and over the Ohio Valley northeastward to the interior of New England. The precipitation from western Pennsylvania northeastward was largely in the form of snow. Temperatures averaged below normal in the South Atlantic area and in all sections south of the Ohio River although departures were not marked. In all other sections of the country the temperatures were higher than normal.

Atlantic slope drainage.—Considerable precipitation, mainly in the form of snow, added to the existent snow cover during the month over much of the area from western Pennsylvania northeastward into the interior of New England. There were two outstanding storms, February 14 and 19 which deposited most of the snow over the above-mentioned area.

Over the Susquehanna Basin mild weather during much of the month resulted in a considerable reduction of the ice thickness in the streams and of the snow depth particularly in the lower portions. Surveys made near the end of February indicate that the snow depth averaged 16.6 inches over the upper basin above Towanda, Pa., and 9.4 inches in the basin at and below Towanda. The maximum depth was 36 inches at Worcester, N. Y., and the minimum was no snow at several points in the lower basin. No flooding or any appreciable rises occurred, but the snow cover continued as a serious flood threat.

Rises, accompanied by minor flooding at a few places, occurred in the streams of the Atlantic drainage from the James River southward. These resulted from moderately heavy rains on the 13th and again on the 19th. No appreciable damage was reported.

East Gulf of Mexico drainage.—Heavy rains on the 5th, 13th, and 17th of the month over much of this area caused rises in most of the streams with some flooding.

The Apalachicola River crested at 20.9 feet at Blountstown, Fla. (flood stage 15 feet), on February 22. A rapid rise to slightly above flood stage occurred at Newton, Ala., on the upper Choctawhatchee River and a slower rise to slightly above flood stage at Caryville, Fla., on the lower reaches during the period February 19 to 22. At Centerville, Ala. (flood stage 23 feet), on the Cahaba River two crests occurred, 27 feet on the 6th and 25.3