rate of progress of the typhoon from 6 a. m. of the 26th to 6 a. m. of the 27th was 21 miles per hour.

According to the reports published in Manila papers "hundreds of people were rendered homeless and foodless in the islands of Camiguin and Cagayan of the Babuyanes group where strong typhoons passed there recently. All houses except the municipal building in Calayan and all crops were destroyed."

The position of the center at 6 a. m. of the 25th, 26th, and 27th was:

September 25, 6 a. m., 128° 00′ longitude E., 15° 30′ latitude N.

September 26, 6 a. m., 122° 50′ longitude E., 18° 35′ latitude N.

September 27, 6 a. m., 114° 40′ longitude E., 20° 35′ latitude N.

China Sea and Indo-China typhoon.—This typhoon was formed on the 28th over the China Sea about 100 miles west of Luzon. It moved westward, traversing the Paracels on the 29th and reaching the coast of Indochina to the north of Tourane in the early morning of October 1.

DETAILS OF THE WEATHER IN THE UNITED STATES

GENERAL CONDITIONS

The outstanding features of the month were the severe tropical storm which struck the southeast Florida coast on the early morning of the 18th; the great extremes of temperature—abnormally cold in the Northwest and coincidently therewith abnormally warm in the South and East—and finally the flood-producing rains in Missouri and adjoining States.—*A. J. H.*

CYCLONES AND ANTICYCLONES

By W. P. DAY

Seventeen low-pressure areas were plotted during September, the majority of which were developments over the Plateau and Rocky Mountain regions and moved northeast or east-northeast into Canada. An unusual number of tropical disturbances developed during the month. On the 13th there were four of these west of longitude 50° W.; one, east of the Leeward Islands, which later passed over Miami; a second, east of Bermuda near longitude 53° W.; a third, about 300 miles southwest of Bermuda; and a fourth of slight intensity south of Cuba. The third storm noted had an unusual history. It was first suspected northeast of the Leeward Islands on the 7th, recurved about 250 miles off the middle Atlantic coast on the 16th and turned northeast, only to be forced to make a loop by an intrusion of high pressure in its path between the 18th and 20th, and finally passed over extreme eastern Newfoundland on the 23d with diminished intensity and reached southern Greenland on the 24th. On the 28th a small hurricane passed inland at Vera Cruz, Mexico; another of great intensity was central over the Azores, and there were indications of a disturbance south of Bermuda. This last depression, however, did not develop and had disappeared by the end of the month.

Only eight high-pressure areas were plotted, but practically all of these were cold-air masses from the Canadian interior. The great HIGH of the 23d–28th brought in the first cold wave of the season to the Rocky Mountain region and the Northwestern States.

FREE-AIR SUMMARY

By L. T. SAMUELS

A comparison of Table 1 and Chart III reveals a strikingly close agreement, the negative temperature departures of the North standing in marked contrast to the positive values of the South. This similarity between the surface and free-air departures is now to be expected in view of the increasing period of observations at the aerological stations. The free-air relative humidity departures were practically all positive, as were those of vapor pressure.

The most pronounced departures in the resultant winds occurred at Broken Arrow and Ellendale, where, as indicated in Table 2, an excess of southerly winds prevailed. It is of particular interest in this connection to note the deficiency in the monthly mean free-air temperatures for Ellendale despite the preponderance of southerly winds at that station. The explanation of this apparently lies in the fact that most of the days on which kite flights were made in southerly winds, the latter were associated with the rear sectors of areas of high pressure. That the temperatures under such conditions are relatively low is further indicated by the fact that in every such instance during the month the temperatures were *below* the monthly mean, whereas in every record obtained in southerly winds associated with the front sector of a low-pressure area the free-air temperatures were *above* the monthly mean. This relationship between the temperatures in HIGHS and LOWS is still further illustrated by the kite records of Ellendale for the 20th and 21st, the tabulated data of which appear below:

Altitude m. s. l. (meters)	20th, 7.12 to 9.15 a. m.		21st, 9.54 to 11 a. m.	
	Temperature °C	Wind direction	Temperature °C	Wind direction
444 (surface)	4.7	SSE.	16.1	NNW.
500	5.7	SSE.	15.7	NNW.
750	10.3	SSE.	13.7	N.
1,000	9.8	SSE.	13.7	N.
1,250	9.1	SSE.	12.9	NNW.
1,500	8.3	SSE.	12.4	NW.
2,000	6.9	SSE.	10.9	NW.
2,500	8.1	SSE.	7.1	W.
3,000	4.6	S.	3.2	W.
3,500	1.1	SSW.	−0.9	W.
4,000	−2.5	SSW.	−5.2	W.

The data for the 20th represents conditions in the rear sector of a HIGH and shows southerly winds prevailing from the ground to 4 kilometers, while the record for the 21st was obtained in the rear sector of a LOW, and in accordance with the pressure gradient under these conditions the winds from the ground to 2 kilometers were mostly northerly. In both cases the velocities were large. It will be seen, however, that with the northerly winds associated with the LOW the temperatures up to 2 kilometers were appreciably *higher* than on the preceding day, when southerly winds prevailed from the rear sector of a HIGH. At 2 kilometers on the 21st where the north component disappeared and the winds became westerly the temperatures became increasingly lower than at the corresponding levels on the 20th. This increase in the lapse rates in the higher levels of LOWS as compared to

that in HIGHS is characteristic of these two pressure systems.

Simultaneous kite flights made at Broken Arrow and Royal Center on the 25th afford excellent illustrations of the free-air conditions in the front sector of an advancing area of high pressure. Both records revealed the coldest air to be between the ground and an elevation slightly more than 1,000 meters. Above this the temperatures at both stations remained relatively high. At Broken Arrow the temperature at 1,755 meters (the maximum altitude) was the same as at the surface, while at Royal Center, where a considerably higher flight was obtained, the temperature at the maximum altitude, 3,665 meters, was only 6° *lower* than that at the surface. Another interesting feature of these records was a rise in the relative humidity to the saturation point *within* the inversion stratum.

TABLE 2.—*Free-air resultant winds (m. p. s.) during September, 1926*

Altitude, m. s. l.	Broken Arrow, Okla. (233 meters)				Due West, S. C. (217 meters)				Ellendale, N. Dak. (444 meters)				Groesbeck, Tex. (141 meters)				Royal Center, Ind. (225 meters)				Washington D. C.[1] (34 meters)	
	Mean		9-year mean		Mean		6-year mean		Mean		9-year mean		Mean		8-year mean		Mean		9-year mean		Mean	
	Dir.	Vel.	Dir.	Vel.	Dir.	Vel.	Dir.	Vel.	Dir.	Vel.	Dir.	Vel.	Dir.	Vel.	Dir.	Vel.	Dir.	Vel.	Dir.	Vel.	Dir.	Vel.
Meters																						
Surface	S. 5°E.	4.9	S.	3.3	N. 70°E.	3.3	N. 61°E.	2.7	S. 89°E.	0.7	W.	0.5	S. 8°E.	2.7	S. 18°E.	1.9	S. 20°W.	1.1	S. 45°W.	1.3	N. 14°E.	1.2
150	S. 5°E.	5.0	S.	3.5	N. 70°E.	3.4	N. 60°E.	2.7					S. 7°E.	3.5	S. 18°E.	2.5	S. 25°W.	1.4	S. 42°W.	1.5	N. 38°E.	1.1
200	S. 1°E.	7.0	S. 8°W.	4.8	N. 65°E.	3.4	N. 55°E.	2.8	S. 71°E.	1.0	S. 71°W.	0.6	S. 4°E.	4.9	S 10°E.	3.9	S 47°W.	3.1	S. 46°W.	3.2	N. 40°E.	0.8
550	S. 7°W.	7.7	S. 15°W.	5.4	N. 75°E.	4.2	N. 62°E.	3.4	S. 46°E.	1.5	S. 50°W.	1.4	S. 1°E.	6.2	S. 5°E.	4.3	S. 58°W.	3.7	S. 55°W.	4.2	N. 18°W.	1.3
7,000	S. 16°W.	8.0	S. 25°W.	5.3	N. 78°E.	4.1	N. 69°E.	3.4	S. 30°E.	1.8	S. 53°W.	2.0	S. 6°W.	7.5	S. 2°E.	4.7	S. 61°W.	4.2	S. 64°W.	4.8	N. 36°W.	3.4
1,250	S. 16°W.	7.8	S. 30°W.	5.1	N. 59°E.	3.8	N. 54°E.	3.1	S. 8°W.	3.4	S. 59°W.	2.7	S. 2°W.	8.3	S. 2°E.	4.8	S. 70°W.	5.5	S. 68°W.	5.8		
1,500	S. 21°W.	7.8	S. 39°W.	5.3	N. 58°E.	3.4	N. 56°E.	2.3	S. 20°W.	5.1	S. 66°W.	3.7	S. 3°W.	9.5	S.	4.7	S. 74°W.	7.1	S. 73°W.	6.6	N. 60°W.	5.1
1,000	S. 22°W.	7.0	S. 45°W.	5.8	N. 77°E.	6.9	N. 66°E.	2.0	S. 31°W.	6.8	S. 71°W.	4.9	S. 2°W.	8.4	S. 1°W.	4.3	S. 73°W.	10.6	S. 75°W.	8.5	N. 73°W.	5.8
2,500	S. 27°W.	6.7	S. 53°W.	5.5	N. 67°E.	5.7	N. 67°E.	1.5	S. 46°W.	8.5	S. 77°W.	6.8	S. 1°W.	7.7	S. 3°E.	4.2	S. 75°W.	15.3	S. 75°W.	10.3	N. 74°W.	6.4
2,000	S. 27°W.	7.3	S. 47°W.	6.3	N. 64°E.	2.0	S. 39°E.	0.1	S. 76°W.	12.7	S. 85°W.	9.0	S. 6°W.	7.9	S.	4.2	S. 80°W.	17.8	S. 74°W.	13.0	N. 76°W.	6.7
3,500	S. 28°W.	7.3	S. 51°W.	6.3					S. 79°W.	15.5	S. 86°W.	10.5	S. 5°W.	6.9	S. 3°W.	3.4	W.	20.5	S. 81°W.	12.3	N. 63°W.	6.9
3,000	S. 45°E.	6.9	S. 68°W.	7.3					S. 86°W.	15.1	N. 80°W.	12.1	S. 58°E.	1.5	S.	3.2	W.	20.0	W.	10.9	N. 64°W.	8.8
4,500									S 69°W.	19.6	N. 79°W.	13.2	S. 22°W.	10.0	S. 4°W.	5.4						
4,000									S. 57°W.	21.8	N. 88°W.	14.6										

[1] Naval air station.

TABLE 1.—*Free-air temperatures, relative humidities, and vapor pressures during September, 1926*

TEMPERATURE (°C.)

Altitude, m. s. l.	Broken Arrow, Okla. (233 meters)		Due West S. C. (217 meters)		Ellendale, N. Dak. (444 meters)		Groesbeck, Tex. (141 meters)		Royal Center, Ind. (225 meters)		Naval air station, D. C. (7 meters)
	Mean	Departure from 9-year mean	Mean	Departure from 6-year mean	Mean	Departure from 9-year mean	Mean	Departure from 8-year mean	Mean	Departure from 9-year mean	Mean
Meters											
Surface	25.3	+1.7	23.8	−0.1	12.2	−2.4	25.9	+1.3	19.5	−1.5	20.8
250	25.2	+1.8	23.5	0.0			24.8	+0.9	19.3	−1.5	19.5
500	23.1	+1.2	21.5	+0.3	12.1	−2.5	22.8	+0.4	17.9	−0.8	18.4
750	21.5	+0.9	20.5	+0.9	11.0	−3.0	21.5	+0.5	17.0	−0.2	17.3
1,000	20.3	+1.0	19.8	+1.3	10.1	−3.0	20.1	+0.3	16.1	+0.3	16.4
1,250	19.3	+1.3	18.2	+0.9	9.8	−2.4	19.0	+0.4	14.9	+0.5	15.6
1,500	18.5	+1.7	16.8	+0.8	9.1	−2.1	17.8	+0.3	14.0	+1.0	14.3
2,000	15.5	+1.3	13.6	+0.3	6.7	−2.0	15.4	+0.2	12.7	+2.2	12.7
2,500	12.4	+1.0	11.8	+1.4	4.5	−1.4	13.2	+0.5	9.8	+2.1	10.7
3,000	9.4	+0.9			1.5	−1.5	10.8	+0.5	7.7	+2.5	8.1
3,500	6.4	+1.0			−0.8	−1.0	7.9	+0.1	5.1	+2.6	5.7
4,000					−3.7	−1.2	6.0	+1.0			3.1
4,500					−6.8	−1.6	2.8	+0.6			
5,000					−10.1	−2.1					

RELATIVE HUMIDITY (%)

Surface	71	+3	76	+10	77	+9	76	0	80	+13	82
250	71	+3	76	+10			79	+3	80	+13	83
500	73	+6	77	+8	74	+7	80	+8	82	+15	81
750	75	+8	75	+5	71	+7	83	+8	82	+15	80
1,000	72	+7	76	+6	69	+7	80	+9	79	+13	78
1,250	72	+8	78	+9	63	+4	75	+7	77	+12	75
1,500	66	+5	75	+6	58	+2	71	+6	73	+10	75
2,000	62	+6	81	+15	55	+2	63	+4	65	+7	66
2,500	57	+5	69	+4	52	0	57	+4	70	+15	58
3,000	51	+2			50	−2	49	0	54	+3	53
3,500	50	−1			51	+1	56	+10	43	−3	44
4,000					45	−2	34	−8			38
4,500					57	+12	21	−19			
5,000					59	+16					

TABLE 1.—*Free-air temperatures, relative humidities, and vapor pressures during September, 1926*—Continued

VAPOR PRESSURE (*mb.*)

Altitude, m. s. l.	Broken Arrow, Okla. (233 meters)		Due West S. C. (217 meters)		Ellendale, N. Dak. (444 meters)		Groesbeck, Tex. (141 meters)		Royal Center, Ind. (225 meters)		Naval air station, D. C. (7 meters)
	Mean	Departure from 9-year mean	Mean	Departure from 6-year mean	Mean	Departure from 9-year mean	Mean	Departure from 8-year mean	Mean	Departure from 9-year mean	Mean
Meters											
Surface	23.14	+3.37	22.42	+3.10	11.59	+0.18	25.34	+1.91	18.59	+1.78	20.52
250	23.01	+3.36	22.11	+3.08			24.79	+2.14	18.44	+1.83	19.31
500	21.20	+3.45	19.80	+2.56	11.07	−0.11	23.48	+2.71	17.22	+2.37	17.66
750	19.55	+3.52	18.05	+2.18	9.77	−0.40	21.37	+2.49	16.23	+2.65	16.14
1,000	17.77	+3.15	17.56	+2.77	9.07	−0.18	18.95	+2.24	14.68	+2.32	15.06
1,250	16.28	+3.13	16.66	+3.10	8.07	−0.18	16.42	+1.57	13.31	+2.17	13.66
1,500	14.30	+2.61	15.45	+2.89	6.94	−0.46	14.28	+1.19	11.95	+2.01	12.48
2,000	11.03	+2.12	13.90	+3.59	5.61	−0.40	10.83	+0.63	9.59	+1.84	9.85
2,500	8.10	+1.49	10.99	+2.46	4.69	−0.30	8.37	+0.49	8.15	+2.22	7.38
3,000	5.70	+0.80			3.92	−0.29	6.11	−0.04	5.57	+1.24	5.39
3,500	4.25	+0.28			3.47	0.00	5.55	+0.65	4.11	+1.15	3.47
4,000					2.88	+0.03	2.49	−1.28			2.50
4,500					2.85	+0.54	0.39	−2.70			
5,000					2.37	+0.58					

THE WEATHER ELEMENTS

By P. C. DAY, In Charge of Division

PRESSURE AND WINDS

Three outstanding features marked the weather of September, 1926: The abnormally heavy and frequent rains in the lower Missouri, middle Mississippi, and Ohio Valleys and some nearby localities; the severe West Indian hurricane over southern Florida and adjacent areas from the 17th to 21st; and the unusually early and