

NW. 8 at 2 p. m. of the 27th in about 120° 28' longitude E. and 25° 43' latitude N.

The approximate position of the center at noon of the 27th was 122° 20' longitude E., 25° 20' latitude N.

DETAILS OF THE WEATHER IN THE UNITED STATES

GENERAL CONDITIONS

The month like its immediate predecessor was on the whole warm and dry. In the Southeast, the Southwest, and locally in some of the North Central States the drought of July was intensified with the result that a serious situation with respect to water for stock and even for domestic purposes obtained in many localities. The usual details follow.—A. J. H.

CYCLONES AND ANTICYCLONES

By W. P. DAY.

Low-pressure areas were rather numerous, but none were important as storms with the exception of a very small disturbance which passed north of Bermuda on the 19th–20th. The latter attained nearly hurricane intensity over a short path northeast of Bermuda and was still in evidence on the 21st, south of Newfoundland.

High-pressure areas were about normal in number, but the majority, as in the preceding month, were of the so-called Alberta type. Five of the nine that were plotted carried through to the Atlantic coast, causing frequent alternations in temperature.

FREE-AIR SUMMARY

By V. E. JAKL

The average free-air temperatures at the aerological stations show about normal values at all altitudes, except at Ellendale and Due West, where a slight, rather uniform, positive departure with altitude was recorded. (See Table 1.) Free-air temperatures from day to day showed but slight variation, closely following the average daily surface temperatures in that respect. Notwithstanding the unusual dryness over considerable areas represented by aerological stations, relative humidities aloft showed no corresponding deficiency, except at Due West, where they were decidedly below normal at all altitudes observed.

The free-air tables for this month include for the first time meteorological data from airplane observations recently begun at the naval air station at Washington, D. C. (See Table 3.) As this method of observation does not include the recording of wind velocity and direction, that portion of the data in Table 3 pertaining to wind is taken from the results of pilot-balloon observations made simultaneously, or nearly so, at the central office of the Weather Bureau at Washington, D. C., a short distance from the naval air station.

The free-air temperature record for Washington shows an average lapse rate about six-tenths of the dry adiabatic, which was probably about normal, inasmuch as the other aerological stations show the usual lapse rate for the time of year, ranging from slightly less to slightly greater than the value for Washington. The following record of the naval air observation on the 20th may be of interest in connection with the thundershower that fol-

Once in China the typhoon recurved to the north and northeast on the 23th and 29th to the west of Shanghai and on the 30th it traversed Korea and the Sea of Japan, moving ENE.

lowed it in a few hours. The storm occurred soon after the surface wind changed to northwesterly from southerly.

Altitude m. s. l. (meters)	Temperature, ° C.	Δt 100 m.	Relative humidity (per cent)	Wind direction	Wind velocity (m. p. s.)
7	27.2		69	SSW.	1
498	29.0	-0.45	48	WSW.	9
1,685	17.3	0.92	85	WNW.	7
3,066	9.7	0.55	36	WNW.	13
3,375	7.9	0.58	44	WNW.	15

Due West shows the only important exception to a general state of normal winds for the month, the records of that station giving resultant winds of northeasterly component up to about 1,500 meters, as distinguished from the normal condition of northeasterly winds at the surface only. These northeasterly winds of moderate depth were the effect of a predominant pressure condition over Due West consisting of HIGHS with centers to the north and northeast. As a result dry weather continued over Due West with but little interruption.

At Ellendale on the 23d the highest surface temperature of record for August occurred at the afternoon maximum, although the record high temperature for August at 1,000 to 2,500 meters above sea level occurred in the early morning of that date. The rise of temperature to the high maximum in the lowest few hundred meters was accomplished by a few hours of insolation, aided by the strong chinook wind which blew during the morning in question and probably also during the preceding night. The influence of the chinook was strong aloft during the night, but it seems to have been largely offset at the surface by radiation. The development of the high surface temperature in this case differs from that noted for Broken Arrow in the June, 1925, Free-Air Summary, where the heating was attributed to the cumulative effect of insolation in connection with light winds to great heights. A low was centered north of Ellendale on the 22d and west of it on the 23d.

Altitude, m. s. l. (meters)	Temperature, °C.	Relative humidity (per cent)	Wind		Temperature, °C.	Relative humidity (per cent)	Wind	
			Direction	Velocity			Direction	Velocity
			Aug. 22				Aug. 23	
Surface (444).....	18.5	70	S.	9	22.0	76	SSE.	8
1,000.....	21.4	39	SSW.	10	32.4	22	SW.	22
2,000.....	20.8	23	WSW.	8	23.8	21	SSW.	19
3,000.....	11.6	23	SW.	6	14.2	43	SSW.	16

The kite flight at Drexel on the 18th is an illustration of change in wind direction at the surface and aloft attending the passage southeastward over the station of the center of a weak low-pressure area. The inversion above 1,000 meters due to colder northeast wind underneath is apparent from the figures; also the change to a

southerly from a northerly component from 1,500 meters to above 2,000 meters, and an oppositely directed change at the surface. This flight was followed by a thunderstorm in the early morning of the following day.

Time	Surface wind		Altitude, m. s. l. (meters)	Temperature, °C.	Relative humidity (per cent)	Wind direction	Wind velocity, (m. p. s.)
	Direction	Velocity (m. p. s.)					
7:08 a. m.	SW.	6	500	22.4	70	SW.	17
7:18 a. m.	SW.	5	1,000	23.8	39	W.	11
7:30 a. m.	SW.	5	1,500	26.4	37	WNW.	11
7:40 a. m.	WSW.	5	2,000	22.3	43	WNW.	11
8:12 a. m.	WSW.	4	3,000	13.4	53	W.	13
9:05 a. m.	WSW.	4	4,000	5.0	44	W.	11
9:59 a. m.	W.	2	3,000	14.0	53	WSW.	12
10:13 a. m.	NNW.	2	2,000	22.4	47	SSW.	7
10:18 a. m.	N.	1	1,500	26.6	44	S.	7
10:25 a. m.	N.	1	1,000	23.3	74	N.E.	7
10:28 a. m.	NNE.	1	500	23.6	65	NNE.	2

Easterly winds to high altitudes were of frequent and quite general occurrence during the last decade, more especially during the middle of this period. The central and eastern portions of the country were then largely under the influence of extensive, slow-moving HIGHS. The height to which these easterly winds were sometimes observed is shown in one case by the single-theodolite pilot-balloon observation at Groesbeck on the 7th, where an abrupt shift from west to east-northeast occurred at 10,000 meters, where cirrus clouds were observed moving from the latter direction. The wind continued from an easterly to northeasterly direction thereafter to the upper limit of observation at 13,400 meters. Also at Broken Arrow on the 18th, the two-theodolite observation to 14,300 meters showed generally easterly winds at all altitudes above 7,000 meters. However, the seasonal recedence of the conditions causing prevailing easterly winds to high altitudes is already apparent in the records for August in the fact that resultant winds having an easterly component were only slightly in evidence at any of the southern stations north of Key West, and at the latter station were evident principally in the records of the morning observations. At San Juan, P. R., and Kingston, Jamaica, the easterly component was persistent, the records for those stations showing easterly winds on every day and at practically every altitude observed.

TABLE 1.—Free-air temperatures, relative humidities, and vapor pressures during August, 1925

Altitude m. s. l. (meters)	TEMPERATURE (°C)											
	Broken Arrow, Okla. (233 m.)		Drexel, Nebr. (396 m.)		Due West, S. C. (217 m.)		Ellendale, N. Dak. (444 m.)		Groesbeck, Tex. (141 m.)		Royal Center, Ind. (225 m.)	
	Mean	De-parture from 8-yr. mean	Mean	De-parture from 10-yr. mean	Mean	De-parture from 5-yr. mean	Mean	De-parture from 8-yr. mean	Mean	De-parture from 7-yr. mean	Mean	De-parture from 8-yr. mean
Surface	28.3	-0.7	22.6	0.0	27.4	+1.4	21.5	+0.9	27.2	+0.2	23.1	-0.6
250	26.3	-0.6	22.6	0.0	27.0	+1.4	21.5	+0.9	26.2	+0.1	22.9	-0.6
500	25.8	+0.2	21.9	-0.2	24.1	+1.1	21.6	+1.1	24.1	-0.1	21.0	-0.3
750	24.8	+0.4	21.2	-0.1	22.1	+0.8	20.6	+1.0	23.2	-0.2	19.5	-0.1
1,000	23.5	+0.4	20.3	0.0	20.4	+0.7	20.1	+1.6	21.4	+0.1	17.7	-0.3
1,250	21.9	+0.3	19.1	0.0	18.7	+0.5	19.1	+1.9	21.0	0.0	16.2	-0.3
1,500	20.1	+0.1	17.9	+0.1	17.2	+0.5	17.5	+1.8	19.5	-0.1	15.0	-0.1
2,000	16.4	0.0	14.8	0.0	14.8	+1.0	14.3	+1.5	16.4	-0.3	11.9	-0.4
2,500	12.4	-0.5	11.5	-0.1	12.2	+1.5	10.8	+1.0	13.4	-0.4	9.0	0.0
3,000	8.9	-0.8	8.5	+0.3	8.9	+1.2	7.5	+0.6	10.3	-0.8	5.9	-1.7
3,500	5.7	-0.9	5.7	+0.8	5.4	+0.8	4.6	+0.6	6.6	-2.0	1.9	-2.3
4,000	3.4	+0.2	2.7	+1.1	2.0	+0.8	2.0	+0.8	2.9	-2.9	-0.6	-2.1
4,500	0.4	+0.5	0.8	+2.2	0.8	+2.2	0.8	+1.0	0.8	+2.2	-2.3	-1.5
5,000	---	---	---	-2.0	---	+2.5	---	---	---	---	---	---

Altitude m. s. l. (meters)	RELATIVE HUMIDITY (%)											
	Broken Arrow, Okla. (233 m.)		Drexel, Nebr. (396 m.)		Due West, S. C. (217 m.)		Ellendale, N. Dak. (444 m.)		Groesbeck, Tex. (141 m.)		Royal Center, Ind. (225 m.)	
	Mean	De-parture from 8-yr. mean	Mean	De-parture from 10-yr. mean	Mean	De-parture from 5-yr. mean	Mean	De-parture from 8-yr. mean	Mean	De-parture from 7-yr. mean	Mean	De-parture from 8-yr. mean
Surface	61	-4	69	-1	53	-14	58	-6	69	-4	66	+1
250	61	-4	69	-1	53	-14	58	-6	71	-3	66	+1
500	56	-6	67	0	59	-14	56	-6	74	0	65	0
750	54	-6	63	+1	57	-14	52	-6	67	-1	65	-1
1,000	53	-6	61	+1	57	-15	49	-7	59	-3	67	+1
1,250	55	-4	61	+2	56	-16	47	-8	59	-1	66	0
1,500	57	-2	61	+3	53	-18	48	-7	60	0	63	-2
2,000	60	-1	61	+3	50	-17	48	-5	62	+3	61	0
2,500	66	+4	56	-1	46	-20	49	-2	62	+5	44	-11
3,000	61	+1	48	-9	44	-22	48	-2	64	+10	47	-3
3,500	59	0	43	-13	49	-18	42	-5	62	+14	46	0
4,000	53	-6	34	-18	60	-9	36	-10	63	+22	48	0
4,500	51	-7	32	-20	34	-11	34	-11	34	-11	38	-10
5,000	---	---	---	---	---	---	---	---	---	---	---	---

Altitude m. s. l. (meters)	VAPOR PRESSURE (mb.)											
	Broken Arrow, Okla. (233 m.)		Drexel, Nebr. (396 m.)		Due West, S. C. (217 m.)		Ellendale, N. Dak. (444 m.)		Groesbeck, Tex. (141 m.)		Royal Center, Ind. (225 m.)	
	Mean	De-parture from 8-yr. mean	Mean	De-parture from 10-yr. mean	Mean	De-parture from 5-yr. mean	Mean	De-parture from 8-yr. mean	Mean	De-parture from 7-yr. mean	Mean	De-parture from 8-yr. mean
Surface	20.55	-2.09	18.55	-0.24	18.56	-3.61	14.20	-0.77	24.56	-0.74	18.85	-0.19
250	20.42	-1.83	18.55	-0.24	18.20	-3.64	13.20	-0.77	23.89	-0.61	18.62	-0.19
500	18.59	-1.35	17.46	-0.30	16.42	-3.13	13.72	-0.91	21.98	-0.24	16.30	-0.30
750	16.75	-1.14	15.63	-0.09	14.98	-2.94	12.05	-0.09	18.82	-0.39	14.65	-0.53
1,000	15.34	-0.98	14.20	-0.01	13.42	-2.99	10.94	-0.87	15.67	-0.88	13.54	-0.45
1,250	14.29	-0.63	13.05	+0.08	11.78	-3.13	9.80	-0.91	14.26	-0.64	12.23	-0.53
1,500	13.29	-0.29	12.08	+0.25	10.10	-3.20	9.07	-0.68	13.32	-0.39	10.73	-0.68
2,000	11.19	-0.04	9.85	+0.05	8.27	-3.20	7.62	-0.28	11.28	-0.02	8.17	-0.68
2,500	9.23	+0.22	7.22	-0.69	6.61	-1.90	6.21	-0.19	9.30	-0.01	3.97	-2.72
3,000	6.47	-0.48	5.14	-1.22	5.23	-1.72	4.99	-0.25	8.14	+0.53	3.04	-1.90
3,500	4.72	-0.57	3.86	-1.22	4.40	-1.25	3.64	-0.58	6.72	+0.78	1.60	-2.13
4,000	3.22	-0.79	2.59	-1.26	4.40	-0.31	2.79	-0.69	5.90	+1.38	0.99	-2.15
4,500	1.98	-0.76	2.34	-0.82	2.21	-0.64	2.21	-0.64	2.21	-0.64	2.21	-0.64
5,000	---	---	---	---	---	---	---	---	---	---	---	---

TABLE 2.—Free-air resultant winds (m. p. s.) during August, 1925

Altitude, m. s. l. (meters)	Broken Arrow, Okla. (233 meters)				Drexel, Nebr. (396 meters)				Due West, S. C. (217 meters)				Ellendale, N. Dak. (444 meters)				Groesbeck, Tex. (141 meters)				Royal Center, Ind. (225 meters)															
	Mean		8-year mean		Mean		10-year mean		Mean		5-year mean		Mean		8-year mean		Mean		7-year mean		Mean		8-year mean													
	Dir.	Vel.	Dir.	Vel.	Dir.	Vel.	Dir.	Vel.	Dir.	Vel.	Dir.	Vel.	Dir.	Vel.	Dir.	Vel.	Dir.	Vel.	Dir.	Vel.	Dir.	Vel.	Dir.	Vel.												
Surface	S.	3.9	S.	1°W.	3.5	S.	12°E.	1.6	S.	14°E.	1.6	N.	25°E.	1.8	N.	26°E.	0.2	S.	7°W.	1.7	S.	35°W.	0.9	S.	13°W.	2.4	S.	15°W.	3.0	S.	63°E.	0.2	S.	60°W.	1.4	
250	S.	4.2	S.	1°W.	3.7	S.	12°E.	1.6	S.	14°E.	1.6	N.	21°E.	1.8	N.	15°W.	0.2	S.	7°W.	1.7	S.	35°W.	0.9	S.	16°W.	3.0	S.	17°W.	4.1	S.	27°E.	0.2	S.	62°W.	1.5	
500	S.	11°W.	6.5	S.	12°W.	5.4	S.	20°E.	3.8	S.	10°E.	2.3	N.	29°E.	2.4	N.	26°W.	0.5	S.	7°W.	2.4	S.	30°W.	1.4	S.	17°W.	4.7	S.	22°W.	5.7	S.	62°W.	1.7	S.	65°W.	3.3
750	S.	20°W.	7.2	S.	19°W.	6.0	S.	16°W.	4.7	S.	5°W.	3.3	N.	22°E.	2.5	N.	36°W.	0.7	S.	27°W.	4.3	S.	35°W.	2.4	S.	14°W.	5.5	S.	20°W.	5.9	N.	79°W.	2.7	S.	72°W.	4.3
1,000	S.	29°W.	7.0	S.	27°W.	6.3	S.	22°W.	5.6	S.	22°W.	3.6	N.	21°E.	2.7	N.	31°W.	0.7	S.	33°W.	4.9	S.	46°W.	2.8	S.	4°W.	5.0	S.	20°W.	5.8	N.	87°W.	3.4	S.	79°W.	5.4
1,250	S.	34°W.	6.4	S.	34°W.	6.0	S.	29°W.	5.8	S.	45°W.	3.3	N.	9°E.	2.2	N.	53°W.	1.0	S.	38°W.	5.0	S.	54°W.	3.1	S.	13°W.	4.0	S.	18°W.	5.4	S.	87°W.	4.5	S.	83°W.	6.1
1,500	S.	43°W.	6.6	S.	40°W.	5.9	S.	40°W.	5.6	S.	49°W.	4.1	N.	2°E.	2.7	N.	68°W.	1.6	S.	47°W.	5.9	S.	58°W.	3.9	S.	22°E.	3.5	S.	16°W.	4.7	N.	86°W.	5.2	S.	87°W.	6.8
2,000	S.	45°W.	6.2	S.	45°W.	5.2	S.	48°W.	4.7	S.	64°W.	5.0	N.	12°W.	3.2	N.	66°W.	2.5	S.	51°W.	7.4	S.	78°W.	4.8	S.	33°E.	3.8	S.	7°W.	4.0	N.	83°W.	5.9	S.	88°W.	7.8
2,500	S.	41°W.	6.9	S.	48°W.	5.4	S.	58°W.	4.4	S.	72°W.	6.4	N.	12°W.	2.9	N.	71°W.	3.4	S.	64°W.	9.3	S.	88°W.	8.8	S.	25°E.	3.5	S.	68°W.	3.9	N.	77°W.	9.2	N.	87°W.	9.3
3,000	S.	36°W.	7.5	S.	47°W.	6.0	S.	79°W.	4.1	S.	81°W.	8.1	N.	80°W.	3.1	N.	80°W.	4.8	S.	66°W.	10.9	N.	87°W.	8.5	S.	25°E.	3.5	S.	11°W.	4.1	N.	77°W.	9.9	N.	85°W.	10.8
3,500	S.	32°W.	7.7	S.	42°W.	6.9	S.	74°W.	4.3	S.	82°W.	9.4	N.	85°W.	7.2	S.	89°W.	7.6	S.	82°W.	13.2	N.	82°W.	11.4	S.	19°W.	4.2	S.	14°W.	5.0	N.	77°W.	10.8	N.	88°W.	10.9
4,000	S.	30°W.	7.9	S.	48°W.	8.1	S.	59°W.	6.5	S.	86°W.	10.6	W.	9.7	N.	88°W.	9.1	S.	37°W.	12.2	N.	80°W.	11.9	S.	22°W.	5.0	S.	3°E.	3.4	N.	83°W.	13.7	S.	89°W.	12.6	
4,500	S.	33°W.																																		