

Stockham, Nebraska, 18th.
 New Haven, Connecticut, 19th.
 Jacksonborough, Ohio, 19th.
 Anna, Illinois, 19th.
 Rochester, Minnesota, 19th.
 Ithaca, New York, 20th.
 Archer, Florida, 20th.
 Wausau, Wisconsin, 24th.
 Vermillion, Dakota, 25th.
 Wytheville, Virginia, 28th, 30th.
 Logansport, Indiana, 29th, 31st.
 Toledo, Ohio, 30th.
 Clay Centre, Kansas, 31st.
 Madison, Nebraska, 31st.
 Wentworth, Dakota, 31st.

POLAR BANDS.

Archer, Florida, 16th.
 Brownsville, Texas, 31st.
 Dale Enterprise, Virginia, 9th, 11th.
 Escanaba, Michigan, 25th.
 Fort Bridger, Wyoming, 27th, 28th.
 Gardiner, Maine, 13th, 20th, 26th.
 Montrose, Colorado, 3d, 10th, 23d, 24th.
 Prairie du Chien, Wisconsin, 9th.
 Riley, Illinois, 10th, 19th.
 Rio Grande City, Texas, 29th.
 Salina, Kansas, 11th.
 Wauseon, Ohio, 4th, 9th.

SAND STORMS.

Fort Concho, Texas, 5th.
 Frisco, Utah, 17th, 18th, 19th.
 Willcox, Arizona, 30th.
 Point Pleasant, Louisiana, 31st.

WATER-SPOUTS.

The s. s. "British Prince," Captain Nowell, on July 3d, in N. 39° 34', W. 63° 35', saw two water-spouts.
 The bark "Levanter," Capt. A. F. Vesper, on July 16th, in N. 28° 10', W. 87° 15', passed a large water-spout.
 The s. s. "Colorado," James Daniels, master, on July 23d, in N. 27° 0', W. 89° 45', observed (sky cloudless) two whirlwinds moving from west to east at the rate of about thirty miles an hour and raising the water to a height of about thirty feet.
 The s. s. "Craigendoran," Capt. A. G. Allen, on July 30th, at 1.30 a. m., in N. 37° 0', W. 77° 0', saw a large water-spout moving southward.

Meteorological record of voluntary observers and Army post surgeons, July, 1885.

The maximum and minimum temperatures at stations marked thus (*) are from readings of the ordinary thermometer.

Stations.	Temperature.				Stations.	Temperature.			
	Maximum.	Minimum.	Mean.	Rainfall.		Maximum.	Minimum.	Mean.	Rainfall.
Alabama.	95	66	73.8	2.51	Colorado.	85	23	51.0	3.45
Greensborough.....	95	66	73.8	2.51	Fort Lyon.....	105	52	74.8	2.83
Mount Vernon B'ks.....	98	59	81.6	4.07	Fort Lytle.....	96	52	74.8	2.83
Arizona.					Fort Meade.....	97	43	71.2	4.96
Fort McDowell.....	114	70	92.9	trace.	North Colebrook *.....	88	56	71.3	2.07
Tucson.....				1.00	Southington *.....	95	53	73	2.28
Arkansas.					Dakota.				
Mount Ida.....	95	57	77.6	6.40	Fort Meade.....	99	45	71.2	1.52
California.					Fort A. Lincoln.....	100	50	72	2.82
Alcatraz Island.....	70	48	57.8	0.02	Fort Pembina.....	94	38	65.1	2.51
Angel Island.....	93	49	61	0.0	Fort Sisseton.....	92	40	69.5	2.79
Cahuenga Valley.....	101	50	75.4	0.0	Fort Sully.....	104	45	75.8	2.80
College City *.....	108	50	80.0	0.0	Fort Randall.....	107	43	76.5	3.83
Fort Mason.....	74	53	60.5	0.0	Fort Totten.....	92	41	67.2	5.71
Fort Mason *.....	101	55	70.1	0.0	Fort Yates.....	97	38	72.9	2.80
Full Brook *.....	105	57	79.9	0.0	Richland *.....	95	46	68.2	2.50
Murrieta *.....	105	57	79.9	0.0	Webster.....	99	46	74.7	4.97
Oakland.....	84	57	63	0.02	Wentworth.....	94	50	70.2	1.34
Poway *.....	97	60	70.7	0.0	Florida.				
Princeton.....	101	54	76.0	0.0	Archer.....	91	71	75.2	5.91
Sacramento.....	97	49	70.5	trace.	Limona.....	95	70	80.9	9.30
Salinas *.....	73	54	61.4	trace.	Mayport *.....	92	73	80.7	5.07
Santa Rosa *.....	87	57	70.8	0.0					
San Rafael (near).....	94	41		0.0					

Meteorological record of voluntary observers, etc.—Continued.

Stations.	Temperature.				Stations.	Temperature.			
	Maximum.	Minimum.	Mean.	Rainfall.		Maximum.	Minimum.	Mean.	Rainfall.
Florida—Continued.	0	0	0	Inches	Minnesota.	0	0	0	Inches
Manatee *.....	92	76	82.3	12.54	Fort Snelling.....	94	52	72.7	5.60
Saint Augustine.....	92	71	80.7	2.57	Minneapolis *.....	94	61	72.6	4.52
Tallahassee *.....	91	74	83	6.55	Northfield.....	92	50	72	5.77
Georgia.					Rochester *.....	100	58		5.62
Milledgeville.....	96	63	80.6	3.04	Montana.				
Illinois.					Fort Assinaboine.....	98	37	67.5	1.58
Anna.....	96	58	79	2.19	Fort Ellis.....	97	37	65.9	3.61
Bunker Hill.....	102	50	79.3	2.29	Fort Keogh.....	104	48	73.1	1.86
Charleston.....	102	46	77	2.83	Fort Shaw.....	95	38	64.3	2.21
Collinsville.....	96	52	74.2	2.37	Nebraska.				
Mattoon *.....	102	58		3.80	Crete.....	93	51	73.6	7.25
Peoria.....	104	53	81.1	4.73	De Soto *.....	97	53	75.2	3.55
Marengo *.....	92	48	71.8	2.07	Fairbury *.....	102	66	88.3	7.56
Rockford.....	93	44	72.5	4.50	Fort Robinson.....	100	50	73.6	2.66
Sycamore *.....	94	53	71.6	4.98	Fremont *.....	99	55	75.1	3.36
Wilton Centre.....	103	39	74.2	4.70	Geneva (near).....	100	49	75.3	1.39
Indiana.					Harvard *.....	110	56		
Fort Wayne *.....	98	56		2.76	Madison *.....	95	59	73.2	1.31
Gulford *.....	97	47	77.1	3.25	Marquette *.....	93	50	80.0	4.75
Jeffersonville.....	99	51	73.2	2.44	Stockham *.....	100	70	86.4	4.80
Logansport *.....	102	46	77.6	4.00	Yutan *.....	100	60	75.6	2.90
Laconia *.....	100	55	78.6	1.33	Nevada.				
Lafayette.....	99	43	75.5	4.07	Carson City.....	100	42	72.3	0.0
Maury *.....	94	42	73.4	1.56	Fort McDermitt.....	94	47	72.6	0.0
Sunman *.....	96	50	79.5	1.30	New Jersey.				
Spiceland.....	96	47	76.1	1.83	Beverly *.....	100	60	77.2	2.75
Vevay.....	99	50	78.4	2.46	Dover.....	95	44	71.7	4.95
Iowa.					Moorstown.....	99	60	74.8	3.08
Cedar Rapids.....	96	53	73.9	6.35	Salem *.....	100	65	76.5	1.48
Cresco *.....	93	57	72.2	5.04	South Orange.....	92	56	73.4	4.00
Des Moines (near).....	97	48	73.9		Somerville *.....	96	61.3	75.6	7.28
Manchester.....	99	54	75.6	5.03	Vineland.....	100	58	78.8	1.29
Fort Madison *.....	100	59		2.40	New York.				
West Union *.....	95	52	70.5	5.25	Auburn.....	88.5	46	70.4	4.64
Guttenburg *.....	96	52	71.2	6.08	Cooperstown *.....	85	50	68.3	3.00
Indianola *.....	96	59	78.2	7.00	David's Island.....	97	60	73.3	1.87
Independence *.....	92	59	73.7	4.99	Fort Niagara.....	88	48	69.8	2.99
Monticello.....	100	51	74.4	6.16	Factoryville.....	93	47	69.8	2.99
Muscataine *.....	102	49	76.5	5.03	Fort Columbus.....	95	57	74.8	3.17
Ottumwa *.....	99	59	77.1	4.36	Houghton Farm.....	98.8	43.5	72.4	2.58
Kansas.					Humphrey.....	90	54	74	2.38
Allison *.....	105	58	76.6	4.01	Ithaca.....	96	46.5	71.3	2.84
Atchison *.....	98	62	78.2	3.77	Le Roy.....	96	44	71.3	2.70
Clay Centre *.....	100	60	77.4	6.06	Madison Barracks.....	90	44	69.8	2.42
Emporia *.....	98	57		10.26	Menard Station *.....	92	57	72.7	2.52
Independence *.....	100	61	78.2	5.02	North Volney *.....	90	52	69.6	4.35
Lawrence.....	96	56	77.1	6.03	Palermo *.....	91	50	67.5	3.85
Manhattan.....	99	56	77.5	4.99	Plattsburg B'ks.....	95	50	69.1	4.04
Owego.....	99	50	77.7	8.95	West Point.....	100	50	74.1	3.60
Towka *.....	100	61	78.5	4.00	White Plains *.....	88	59	73.9	5.30
Salt Lake.....	88	62	79.0	7.02	New Mexico.				
Sterling.....	99	60	76.8	6.08	Fort Wingate.....	96	49	70.4	2.28
Sterling *.....	96	63	77.2	4.71	Fort Union.....	91	48	70.0	2.51
Wellington.....	102	64	70.6	4.94	Gallinas Spring.....	93	60	70.0	1.65
W. Leavenworth *.....	99	61		4.00	Puerto de Luna *.....	99	63	79.0	0.65
Wyandotte *.....	99	60	79.7	4.76	North Carolina.				
Yates Centre *.....	98	59	78.2	11.68	Chapel Hill *.....	100	61	79.6	3.95
Louisiana.					Flap Rock *.....	87	49	71.1	2.84
Grand Coteau.....	94	69	82.7	5.21	Lincolnton *.....	88	60	80.0	3.77
Luling *.....	94	69		5.94	Baligh *.....	98	63	80.4	2.00
Point Pleasant *.....	96	67	84	4.63	Statesville *.....	93	60	80.4	4.47
Maine.					Weldon *.....	100	62	80.5	3.86
Cornish.....	80	54	67.3	3.64	Ohio.				
Fort Preble.....	86	57	70.0	3.40	Cleveland *.....	91	53	72.9	4.18
Gardiner.....	83	50	67.3	1.73	College Hill.....	103	57	80.5	2.60
Orono.....	86	54	67.8	4.70	Garrettsville.....	92	43	69.9	5.55
Missouri.					Hiram *.....	92	54	93.1	5.37
Carthage.....	90	60	80.8	4.31	Jacksonburg.....	100	51	79.6	3.65
Centreville.....	97	53		5.53	North Lewisburg.....	99	51	75.8	2.45
Conception.....	95	55	76.6	1.75	Portsmouth.....	95	47	75.3	2.12
Independence *.....	92	54	74.6	6.43	Buggles *.....	94	52	71.3	3.15
Pierce City.....	98	59	76	8.70	Tiffin *.....	95	53	76.5	3.21
Springfield.....	94	59	77.6	9.14	Wauson.....	98	46	74.4	3.03
Massachusetts.					Westerville.....	95	44	73.2	3.53
Amherst (Agr'l St'n).....	93	41	68.4	2.07	Yellow Springs *.....	98	54	74.2	3.16
Deerfield.....	93.5	42.3	70.5	2.25	Oregon.				
Princeton.....	89.5	48	68.5	4.23	Albany *.....	98	56	68.4	0.0
Rowe *.....	86	48	67.8	4.16	East Portland *.....	96	56		0.04
Somerset *.....	104	44	75.5	2.37	Boin *.....	98	62	66.9	0.0
Taunton.....	94	50	71.9	2.56	Pennsylvania.				
Williamstown.....	76.9	42.7	64.8	2.87	Catawissa.....	96	50		3.26
Westborough.....	96	45	75.2	1.56	Dyberry.....	93	40	69.2	1.70
Worcester.....	87	53	68.9	2.10	Easton *.....	101	61	82.5	2.63
Maryland.					Fallington.....	97	59	74.1	4.05
Cumberland.....	95	56	74.5	1.01	Grampan Hills.....	94	52	72.1	6.14
Emmitsburg.....	98	59	70.6	2.10	Mahanoy Plane *.....	97	58	77.5	1.75
Fort McHenry.....	97	66	77.7	2.15	South Bethlehem.....	103	46.4	72.5	3.48
Fallston *.....	97	52	74.5	3.33	West Chester.....	98	53	76	0.93
Woodstock.....	98	50	76.2	3.38	Wellsborough *.....	96	54	71.5	3.77
Great Falls *.....	100	54	78.4	0.39	Wilkesbarre.....	97.2	42	72.4	3.01

Meteorological record of voluntary observers, etc.—Continued.

Stations.	Temperature.			Rainfall.	Stations.	Temperature.			Rainfall.
	Maximum.	Minimum.	Mean.			Maximum.	Minimum.	Mean.	
<i>Texas</i> —Continued.	°	°	°	Inch.	<i>West Virginia.</i>	°	°	°	Inch.
Clarksville *.....	95	68	81.7	7.95	Helvetia.....	96	38	71.2	4.41
Fort Brown.....	96	71	85	0.13	Washington Territory.....				
Fort Concho.....	108	67	86	1.08	Bainbridge Island *.....	87	50	65.6	0.82
Huntsville *.....	94	65	81.5	3.24	Ellensburg *.....	86	51	66.4	0.26
New Utm.....	95	73	81.5	3.24	Kiowick *.....	104	52	trace
<i>Utah.</i>					Tacoma *.....	86	51	66.4	0.26
Nephi *.....	93	51	72.2	0.02	<i>Wisconsin.</i>				
<i>Vermont.</i>					Madison.....	90	56	75.2	7.30
Brattleborough.....	94	42	72.4	2.40	Neillsville.....	93	32	65.5	5.65
Burlington.....	90	49.6	68.3	3.80	Prairie du Chien *.....	98	55	74.5	6.37
Dorset.....	88.5	42	66.2	4.35	Wausau.....	90	42	59.3	4.41
Lunenburg *.....	85	48	66.2	6.46	Waukesha *.....	100	51	71.4	5.34
Newport.....	93	50	69	6.62	Beloit.....	96	44	73.3	2.99
Stratford.....	88	54	68.6	4.90	Embarras *.....	89	56	71.8	10.45
Woodstock.....	93.4	44	68.7	3.29	Lancaster.....	96	48	73.5	5.99
<i>Virginia.</i>					Manitowoc *.....	92	46	67.7	5.57
Accotink *.....	101	62	80.7	1.78	<i>Wyoming.</i>				
Bird's Nest *.....	99	67	82.9	4.45	Fort Bridger.....	90	34	67.7	0.22
Dale Enterprise.....	100	51	79.9	2.86	Fort Fred Steele.....	94	40	69.7	0.94
Fort Monroe.....	95	56	79.9	0.97					
Wytheville.....	90	43	72.9	1.32					

In the preceding table are given the maximum, minimum, and mean temperatures, and the monthly rainfall at voluntary stations and United States military posts.

With this REVIEW, and in succeeding numbers, all complete and continuous reports that are promptly received will appear in a similar table. The attention of voluntary observers, who forward reports, is invited to the importance of keeping complete and continuous records. Those who find it impracticable to follow the "Instructions for Voluntary Observers," page 92, which provide that the mean daily temperature shall be obtained by dividing the sum of the 7, 2, and twice the 9 o'clock observations by four, can, however, make valuable reports by recording the maximum and minimum, or highest and lowest observed, temperatures daily, and obtain a monthly mean by dividing the sum of all such observations by the number of observations made. It is requested that the kind of instruments used be stated in the summary. It is especially desirable that all observers, who have meteorological records extending back over a period of years, will deduce therefrom normals, particularly of temperature and precipitation, for purpose of comparison. All comparisons of this nature will be published in the REVIEW tables. It is the custom of a number of observers to note these comparisons from month to month, but there are many, having records covering many years of continuous observations, who, by omitting to compare the means of the month for which the report is made with the normal for that month, render reports much less interest than they would otherwise be.

ERRATUM.

In the June, 1885, REVIEW, on page 159, in the table of miscellaneous data, the departure from normal temperature at Helena, Montana, given as -2°3 should read -4°3.

NOTES AND EXTRACTS.

The following extract is from the July, 1885, report of the "Alabama Weather Service," under direction of Prof. P. H. Mell, jr., Auburn:

The conditions of the weather over the whole state have been very favorable for the growth and maturity of the corn crop, and the rapid development of the cotton plant. Reports from many sections state that the outlook for an abundant yield has not been so promising for many years, and the farmers everywhere are very much encouraged.

The average temperature given this month is exactly the same as that published in the bulletin for July, 1884.

The rainfall was slightly below the average for last year, but the uniform distribution, following the weather conditions of June, produced the results on the farms mentioned above.

Thunder-storms have been of frequent occurrence, and in some portions of the state the display of electricity was brilliant and alarming in its close proximity and rapid succession of flashes. Prattville and Tusculmbia reported some stock killed by lightning. Some of these storms were accompanied with

strong winds that damaged fences, trees, and small buildings, but they were entirely local, and their tracks were very limited in extent.

State summary.

Mean temperature, 80°5; highest temperature, 108°, at Calera, on the 30th; lowest temperature, 48°, at Gadsden, on the 2d; range of temperature, 55°; greatest monthly range of temperature, 49°, at Gadsden; least monthly range of temperature, 13°, at La Fayette; mean daily range, 16°6; greatest daily range of temperature, 40°, at Calera, on the 4th; least daily range of temperature, 1°, at Huntsville, on the 10th, Jacksonville, on the 26th, and Mount View, on the 12th.

Mean depth of rainfall, 4.18 inches; mean daily rainfall, 0.132; greatest depth of monthly rainfall, 8.00 inches, at Prattville; least depth of monthly rainfall, 1.76, at Pine Apple; greatest daily rainfall average for state, 0.39 of an inch, on the 11th; greatest daily local rainfall, 1.75 inches, at Edwardsville, on the 27th.

Average number of days on which rain fell, 13. Average number of cloudy days, 9; average number of fair days, 15; average number of clear days, 7; warmest days, 30th, 31st; coldest days, 1st, 2d.

Prevailing direction of wind, southwest.

Thunder-storms were general on the 4th, 5th, 6th, 9th, 10th, 11th, 12th, 20th, 22d, 23d, 25th, 26th, 27th.

The following meteorological summary and accompanying remarks are from the July, 1885, report of the "Indiana Weather Service," under direction of Prof. H. A. Huston, of Purdue University, Lafayette:

Districts.	Temperature.			Precipitation.
	Highest.	Lowest.	Monthly mean.	
Northern counties.....	102	48	75.53	1.96
Central counties.....	99	42	75.48	2.40
Southern counties.....	103	50	77.25	2.23
State.....	103	42	76.09	2.19

The mean temperature of the state for July, 76°09, was 2°53 above that for last year, 0°51 below the mean of fourteen years at Indianapolis, 1°51 below the mean of twenty-six years at Logansport, 2°61 below the mean of twenty-one years at Vevay, 2°04 above the mean of four years at Blue Lick, 3°25 above the mean of four years at Worthington, 3°99 above the mean of five years at Mauzy, and 3°49 above the mean of six years at this station.

The mean precipitation for the state, 2.19 inches, was 2.38 below that for last year, 3.35 below the mean of fourteen years at Indianapolis, 2.09 below the mean of twenty-six years at Logansport, 2.96 below the mean of twenty-one years at Vevay, 1.41 below the mean of four years at Blue Lick, 2.26 below the mean of four years at Worthington, 0.70 below the mean of four years at Mauzy, and 1.60 below the mean of six years at this station. The rainfall was very unevenly distributed, ranging from 0.40, in Allen county, to 6.31, in Carroll county.

The mean barometer in the state was 30.004 and the monthly range, 0.494. Wind, total miles for July, Indianapolis, 3,204; Greencastle, 3,060; Lafayette, 4,645. Temperature of water in wells: Blue Lick, well 25 feet deep, 55°; Lafayette, well 112 feet deep, 52°; Miami, 58°.

Prof. W. H. Ragan, director of the "Indiana Volunteer Weather Service," furnishes the following meteorological summary for July:

Highest monthly mean temperature, 79°5, at Sunman; lowest mean, 69°5, at Danville; highest reading, 102°, at Logansport, on 20th; lowest reading, 42°, at Mauzy, on 1st. The 20th was the warmest day at most stations, and the 1st the coldest.

The temperature averaged 8° higher in the state than in 1883, and 2°3 higher than in 1884, and the rainfall 2.27 lower than in 1883, and 2.26 lower than in 1884. The crops do not seem to have suffered greatly for rain, from which it might be deduced that the normal rainfall for this month is nearly twice the amount absolutely required; the amount this year having been but little more than half the normal, and there having been no general excess during June to carry forward. The rainfall was unevenly distributed through the month and over the state, ranging from 10.70, on the 22d, to none on the 1st, 2d, 10th, 12th, 14th, 16th, 19th, 28th, and from 4.80, at Crawfordsville, to 0.40, at Fort Wayne. There was a general wet spell from the 21st to the 26th, during the great bulk of the rain fell in all sections.

The following is an extract from the July, 1885, report of the "Minnesota Weather Service," under direction of Prof. Wm. W. Payne, Northfield:

The average temperature of July in Minnesota has varied from slightly below the normal in the extreme northwest, to from 0°5 to 1°3 above the normal in the central and southern parts of the state. From the 1st to the 19th the temperature was near the average, after which a slight depression in pressure in the British Northwest and Montana induced southerly, moist air currents, and a gradually increasing temperature until the 30th, when the highest temperatures for the month were generally observed. This heated term, accompanied as it was by a high degree of humidity and frequent thun-

der, hail and wind storms, was the cause of widespread and general damage to small grain just at the most critical period of its growth. On the 30th and 31st northerly winds produced a decided fall in temperature and a decrease in humidity, bringing about more favorable conditions for the proper development of the wheat plant, with the prospect of a comparatively abundant yield of small grain for Minnesota and Dakota. The lowest temperatures were on the 1st, in the southeastern, and the 17th, in the northwestern, parts of the state, this during the prevalence of a high area of the barometer in each of the sections above named. 38°.4, at Park Rapids, on the 17th, and 39°.2, at Saint Vincent, on the same date, were reported, but without frost. A marked feature of the month was the high degree of moisture in the air, amounting to from 8 to 15 per cent. above the mean.

Precipitation.—The rainfall for July, was, in general, much above the average, and well distributed. A local drouth prevailed at Mankato, where but 1.11 inches was measured. The large amounts of 8.51, 6.19 and 5.99 inches occurred at La Crosse, Park Rapids, and Red Wing, respectively. Thunderstorms were frequent and destructive. Rainfalls of over one inch in one day: Saint Paul, 1.15, on 19th, and 1.02, on 28th; Duluth, 1.61, on 12th; Saint Vincent, 1.39, on 16th; La Crosse, 1.66, on 8th, 1.00, on 25th, and 3.20 (2 inches of which fell in two hours), on the 29th; Bird Island, 1.05, on the 16th; Northfield, 1.39, on 29th; Red Wing, 2.83, on 22d, and 1.06, on 29th; Park Rapids, 2.83, on 3d, and 1.65, on 29th.

State summary.

Mean temperature, 70°.9; highest temperature, at Sherburne, 99°.0; lowest temperature, at Park Rapids, 38°.4; range of temperature, 60°.6; mean of maximum temperature, 93°.1; mean of minimum temperature, 49°.9.

Highest barometer, Winona, 7th, 30.298; lowest barometer, Saint Vincent, 6th, 29.324; mean barometer, 29.889.

Mean rainfall, in inches, 4.62; greatest rainfall, La Crosse, 8.51; least rainfall, Mankato, 1.11; greatest rainfall in one day, La Crosse, 29th, 3.20.

Mean relative humidity, 77.4 per cent.

Average monthly movement of wind in miles, 4,789; greatest monthly movement of wind in miles (at Bird Island), 7,241; least monthly movement of wind in miles (at Red Wing), 3,299.

The following is an extract from the "Missouri Weather Service," under direction of Prof. Francis E. Nipher, Saint Louis:

The mean temperature at the central station was 1°.8 above the normal for July at Saint Louis. The highest temperatures were observed in the latter decade of the month, the 30th being generally, all over the state, the warmest day of the month. The heat was felt, however, very nearly as much in the first part of the month, on account of the sultry, close state of the atmosphere.

The lowest temperature was pretty generally observed on the first of the month.

The rainfall was heaviest in the southwestern part of the state, the lightest being along the eastern border. At Saint Louis it was considerably below the normal for July, which is 4.16 inches.

In one or two instances hail was observed in different parts of the state.

The following notes are taken from the reports:

Glasgow: 18th to 31st, very hot; wheat crop poor; an abundance of fine hay just up; good crop of oats, prospect for a fine crop of corn; apple crop very poor; blackberries very scarce. Savannah: extremely dry up to 28th; corn, oat, spring-wheat and potato crops fine; a change of 40° in temperature occurred in eighteen hours on the 16th. Graham: weather unusually dry up to the 22d, some corn suffered, the quality of the wheat is better than usual, it being harvested without much rain; hay better than usual in quantity and quality; the only severe storm occurred on the 27th, the rainfall being as much as 1.21 inches in fifteen minutes. Saint Charles: prospects for corn crop very fine; yield of wheat and quality poor; potatoes in abundance. Greenfield: very heavy rainfall on the 3d (3.10 inches), doing damage to wheat in shock and to corn, and to property in some instances; has been an extremely hot month, ranging from 84° to 98° at 14h. Miami: a remarkable rain and wind storm occurred on the 29th. Louisiana: the weather of the last decade of the month has been exceedingly sultry, rendering outdoor exertion, even the least, irksome in the extreme. Houstonia: corn coming out very much; wheat turning out poorly, about one fourth crop; a great deal of hay being put up. Chamois: the normal temperature for this place (taken from twelve years observations) for July is 78°.95, which is 1°.84 below what it was during the past month. The rainfall was 3.78 inches above the normal.

The following is an extract from the July, 1885, report of the "Nebraska Weather Service," under direction of Prof. Goodwin D. Swezey, of Doane College, Crete:

The temperature has been about normal but with extremes of heat and cold, the highest temperatures reported exceeding those of the past seven Julys, except in 1882 and 1883, and the lowest being lower than any except 1884.

Rainfall has been quite unequally distributed, the northeast section of the state receiving nearly double the southwest, but on the whole it was above the normal. About the usual number of hail and thunder-storms have occurred; fogs have been uncommonly rare. While the record of decidedly clear days has been normal, the number of decidedly cloudy days has been unusually great. The average rain for the different sections of the state for July, 1885, is as follows: northeast section, 5.28 inches; southeast section, 6.54; northwest section, 5.69; southwest section, 3.58. Greatest number of days of appreciable precipitation, 15, at Stockham.

Beginning with July, arrangements have been made for the display of "cold-wave flags"—white flag with black centre—at Omaha and at Crete, the prediction being telegraphed from Washington, usually from twenty-four to twenty-eight hours in advance; during the fall and spring these timely warnings may save many dollars worth of perishable property to those in sight of these flags. Anyone may receive these warnings by paying the cost of the telegram from Omaha. It is hoped that a good number of our observers may provide and display flags in this way. Advice as to expense may be had of the director.

The following is an extract from the July, 1885, report of the "Ohio Meteorological Bureau," under direction of Prof. B. F. Thomas, of the Ohio State University, Columbus:

An examination of the monthly reports show that July, 1885, did not differ materially from that of the two preceding years, except in temperature.

The mean atmospheric pressure, 29.975 inches, was .008 of an inch above the average of the past three years. The maximum pressure, 30.28 inches, was .03 of an inch below that of 1883, and .01 above that of 1884, while the minimum, 29.61 inches, was .04 below that of 1883, and .04 above that of 1884.

The month was not characterized by any sudden changes in the barometer.

The mean temperature for the month, 75°.2, is only 0°.7 above what may be considered as the normal, but it is 2°.3 above the mean of the past three years. The mean of the first half of the month was very low for July, but the unprecedented high temperatures of the last half of the month brought the monthly mean above the normal. The maximum temperature for the month, 101°.0, was recorded on the 21st, at the Ohio State University; this is 2° higher than the highest reported since the organization of the Bureau; the highest reported heretofore was 99°.0, on October 1, 1884, at Ironton. The following stations report a maximum temperature for July in excess of that reported from Ironton in 1884: North Lewisburg, 99°.3, on the 21st; Waverly, 99°.5, on the 20th; Ohio State University, 101°.0, on the 21st; Logan, 100°.0, on the 20th; Pomeroy, 100°.8, on the 20th. While the lowest maximum reported was 89°.0, on the 20th and 21st, at Jefferson, Ashtabula county; the minimum temperature for the month, 40°.0, was reported from Ironton, on the 1st; this is 3°.0 below the minimum for July, 1883, and 1°.0 below that of 1884.

State summary.

Mean barometer, 29.98 inches; highest barometer, 30.28 inches, on the 18th, at New Bremen; lowest barometer, 29.61 inches, on the 13th, at Oberlin; range of barometer, .68 inch.

Mean relative humidity, 74.1 per cent.

Mean temperature, 75°.2; highest temperature, 101°.0, on the 21st, at Ohio State University; lowest temperature, 40°.0, on the 1st, at Hanging Rock; range of temperature, 61°.0; mean daily range of temperature, 22°.8; greatest daily range of temperature, 43°.0, on the 4th, at New Bremen; least daily range of temperature, 6°.1, on the 18th, at Cleveland, and on the 22d, at Sandusky.

Average number of clear days, 12.8; average number of fair days, 14.5; average number of cloudy days, 3.7; average number of days on which rain fell, 11.6; greatest number of days on which rain fell, 15; least number of days on which rain fell, 4.

Mean rainfall, 3.20 inches; average daily rainfall, .103 inch; greatest rainfall, 5.69 inches, at Hudson; least rainfall, 1.23 inches, at Ainger.

Prevailing direction of wind, southwest.

