

U. S. DEPARTMENT OF AGRICULTURE, WEATHER BUREAU.
ILLINOIS SECTION.

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GENERAL SUMMARY.

With the exception of the third week of the month the weather was too cold for normal plant development, and in places plowing and planting operations were delayed by rains and the cold, wet condition of the soil. It was the coldest May since before 1878. Freezing temperatures occurred over much of the north two-thirds of the State during the first decade and in the northern division on the 23d. By the latter date vegetation was somewhat advanced, and early vegetables and other tender plants were killed. The frost damage in the central and southern counties was unimportant. The season was fully ten days backward. Corn plowing and planting continued throughout the month, but the planting had not been entirely completed at its close and very little cultivating had been done. Much of the wheat was plowed up, but the remaining fields showed some improvement, and oats were reported in excellent condition in all parts of the State. Meadows, pastures, and vegetables were backward. Except for the failure of the peach crop, the condition of fruit was satisfactory. The rainfall was quite heavy in parts of the south half of the State, but no records were exceeded. Large hailstones fell at a number of places on the 26th, the sizes of the larger ones being reported as follows: Morrison, 6 to 9 inches in circumference; Joliet, 1-1-4 by 4 inches; Charleston, 2 1-2 by 1 1-2 inches; Mattoon, as large as a baseball. Although the number of thunderstorms was not unusually great, several destructive wind storms occurred during the month. On the 9th, at Macomb, there was minor damage to trees and buildings, and a man was killed by lightning. A wind storm in Hamilton and White counties on the 21st, said to have had a funnel-shaped cloud, caused property damage of \$10,000 to \$15,000. One person was injured and one was reported killed. On the 30th there was a \$2,000 loss to buildings at Dudley, Edgar County, trees were uprooted in other parts of central Illinois, and severe thunder-squalls in Alexander and Pulaski counties caused the death of five persons and property losses of at least \$200,000. The tornadic storms of the 26th and 27th are discussed in detail in a special article on page 40 of this number.

TEMPERATURE.

Mild temperatures obtained from the 15th to 21st and on the 26th, the 19th being the warmest day as a rule. The rest of the month was unseasonably cold, with a deficiency of more than 10° from the 3d to 7th and 22d to 23d.

PRECIPITATION.

The precipitation averaged almost normal, but some of the individual station amounts were rather heavy. In the south half of the State a number of stations reported totals of more than 5 inches, and at some of these there was an excess of 1 to 4 inches. The least rain fell in the north-central section, where the amounts are 1 to 2 inches below the normal. The first decade was showery in the central and southern divisions, the second was dry, and the last was rainy. Snow fell throughout much of the central division and at several stations in the north, occurring principally on the 4th. At Springfield it was the latest snow on record. The snow melted as it fell and, with one exception, no measurable amounts were recorded.

PRESSURE, WIND, HUMIDITY, AND SUNSHINE DATA.

Stations.	Atmospheric pressure (reduced to sea level).				Wind.				Relative humidity.		Percentage of sunshine.	
	Mean.	Highest.	Date.	Lowest.	Date.	Average hourly velocity.	Maximum velocity.	Direction.	Date.	Mean 7 a.m.		Mean 7 p.m.
Cairo.....	29.94	30.26	14	29.45	22	10.1	42	s.	30	76	60	...
Chicago.....	29.96	30.27	14	29.49	22	13.6	35	nw.	19	58	58	60
Peoria.....	29.95	30.29	14	29.43	22	7.8	30	n.	8	73	59	61
Springfield....	29.93	30.28	14	29.33	22	8.7	30	nw.	8	76	62	61

COMPARATIVE MAY DATA FOR THE STATE.

Year.	Temperature.				Precipitation.				Number of days.			Prevailing wind direction.	
	Mean.	Departure.	Highest.	Lowest.	Average.	Departure.	Greatest in 24 hours.	Avg snowfall.	Precipitation, 0.1 inch or more.	Clear.	Partly cloudy.		Cloudy.
1878.....	60.9	-1.9	.....	.....	5.30	+1.23	.....	.....	.....	.....	.....	.....	.....
1879.....	63.2	+0.4	.....	.....	2.41	-1.66	.....	.....	.....	.....	.....	.....	.....
1880.....	68.1	+5.3	.....	.....	5.34	+1.27	.....	.....	.....	.....	.....	.....	.....
1881.....	63.1	+0.3	.....	.....	2.96	-1.71	.....	.....	.....	.....	.....	.....	.....
1882.....	58.1	-4.7	.....	.....	6.70	+2.63	.....	.....	.....	.....	.....	.....	.....
1883.....	58.9	-3.9	.....	.....	5.45	+1.38	.....	.....	.....	.....	.....	.....	.....
1884.....	61.6	-1.2	.....	.....	4.27	+0.20	.....	.....	.....	.....	.....	.....	.....
1885.....	60.8	-2.0	.....	.....	2.93	-1.14	.....	.....	.....	.....	.....	.....	.....
1886.....	61.8	+2.0	.....	.....	4.12	+0.05	.....	.....	.....	.....	.....	.....	.....
1887.....	67.4	+4.6	.....	.....	2.94	-1.13	.....	.....	.....	.....	.....	.....	.....
1888.....	59.2	-3.6	.....	.....	5.41	+1.34	.....	.....	.....	.....	.....	.....	.....
1889.....	61.0	-1.8	.....	.....	4.98	+0.91	.....	.....	.....	.....	.....	.....	.....
1890.....	59.3	-3.5	.....	.....	3.97	-0.10	.....	.....	.....	.....	.....	.....	.....
1891.....	59.2	-3.6	.....	.....	2.25	-1.82	.....	.....	.....	.....	.....	.....	.....
1892.....	58.6	-4.2	.....	.....	8.14	+4.07	.....	.....	.....	.....	.....	.....	.....
1893.....	59.3	-3.5	.....	.....	4.34	+0.27	.....	.....	.....	.....	.....	.....	.....
1894.....	61.5	-1.3	.....	.....	3.28	-0.79	.....	.....	.....	.....	.....	.....	.....
1895.....	63.8	+1.0	99	24	2.38	-1.69	2.16	0.0	8	12	13	6	sw.
1896.....	69.5	+6.7	98	41	5.78	+1.71	4.80	0.0	11	12	12	7	sw.
1897.....	59.3	-3.5	90	27	1.93	-2.14	2.36	T.	7	14	12	5	nw.
1898.....	62.2	-0.6	93	30	5.78	+1.71	4.14	0.0	14	11	10	10	ne.
1899.....	64.0	+1.2	93	33	6.06	+1.99	5.33	0.0	13	9	12	10	s.
1900.....	64.8	+2.0	93	25	4.22	+0.15	3.15	0.0	11	13	10	8	sw.
1901.....	61.6	-1.2	94	29	1.89	-2.18	2.88	0.0	8	12	11	8	ne.
1902.....	67.2	+4.4	97	32	4.18	+0.11	3.22	0.0	11	13	12	6	sw.
1903.....	65.2	+2.4	93	24	3.19	-0.88	3.29	0.0	10	10	13	8	s.
1904.....	62.1	-0.3	94	27	3.41	-0.66	3.19	0.0	11	12	10	9	nw.
1905.....	63.1	+0.3	94	33	4.41	+0.34	4.58	T.	10	13	10	9	s.
1906.....	63.8	+1.0	95	26	2.70	-1.37	3.47	T.	8	15	9	7	sw.
1907.....	56.7	-6.1	92	22	4.02	-0.05	3.54	0.2	11	12	8	11	s.
1908.....	63.3	+0.5	95	23	7.76	+3.69	4.59	T.	15	11	9	11	sw.
1909.....	60.3	-2.5	93	25	4.01	-0.06	3.36	T.	10	15	8	8	s.
1910.....	58.0	-4.8	89	24	4.96	+0.89	3.20	T.	11	13	8	10	nw
1911.....	68.2	+5.4	101	24	1.92	-2.15	3.94	T.	6	19	8	3	sw.
1912.....	64.8	+2.0	94	31	3.84	-0.23	2.99	0.0	10	15	9	7	sw.
1913.....	62.9	+0.1	99	28	3.09	-0.98	3.04	0.0	8	14	7	8	sw.
1914.....	65.3	+2.5	97	29	2.30	-1.77	5.30	0.0	7	19	8	4	sw.
1915.....	59.8	-3.0	97	28	6.99	+2.92	5.35	T.	15	8	9	14	sw.
1916.....	63.6	+0.8	95	29	4.69	+0.62	2.50	T.	12	12	10	9	sw.
1917.....	55.6	-6.2	92	27	4.22	+0.15	3.67	T.	11	12	9	10	ne.

Climatological data for May, 1917.

Table with columns: Stations, Counties, Elevation, Length of rec., Mean, Departure from normal, Highest, Date, Lowest, Date, Greatest daily range, Length of rec., Total, Departure from normal, Greatest in 24 hours, Total snowfall, Precipitation, Clear, Partly cloudy, Cloudy, Prevailing direction of wind, Observers.

The departures from normal temperature and precipitation are computed only for such stations as have ten or more years of record, but all complete reports are used in determining division and state averages. Reference letters a, b, c, etc., appearing in the table indicate number of days missing; for example, b represents two days, etc. T, Trace, or less than 0.01 inch precipitation or 0.1 inch unmelted snow. † Post Office address, Marengo. ‡ Also on subsequent dates.

Daily temperatures for May, 1917.

Table with columns for Stations, days 1-31, and Mean. Rows are categorized into Northern Division, Central Division, and Southern Division, listing various Illinois cities and their daily temperature ranges.

§§ Instruments are read in the morning; the maximum temperature then read is charged to the preceding day, on which it almost always occurs. Reference letters, a, b, c, etc., appearing in the table indicate number of days missing; for example, b represents two days, etc.

THE TORNADOES OF MAY 26TH AND 27TH, 1917.

By CLARENCE J. ROOT, Section Director.

Severe and destructive tornadic storms occurred in Illinois and some of the adjoining states on May 26th and 27th, causing in Illinois alone 105 known deaths, the injury of 680 persons, and property losses of three and one-third millions of dollars. The 7 a. m. weather map of May 26th shows a center of low barometer (29.38 inches) at Sioux City, Ia., with east and southeast winds in central and northern Illinois, and all stations reporting showers and thunderstorms during the night. At 7 p. m. the disturbance was central in northern Illinois, the readings ranging from 29.54 inches to 29.56 inches. During the time of the tornadoes the low pressure center was probably located in southeastern Iowa, thus placing the more important tornado in the southeastern quadrant of the "low." Saturday evening a secondary center appeared in Texas, moving to Oklahoma by Sunday morning, and southern Illinois by Sunday evening.

The northern storm was first seen at Mendota, La Salle County, at 3:10 p. m. of the 26th. It moved slightly south of east, gradually curving to the eastward, moving through the northern part of La Salle County, near the boundary between Kendall and Grundy counties, traversing the entire width of Will County, and expanding its force after passing across two counties in Indiana. It passed through Manhattan at 4:50 p. m. and reached Kouts, Ind. at 5:56 p. m., thus traversing a distance in both states of 110 miles in 2 hours and 46 minutes, or at an average velocity of translation of 40 miles per hour. It is reported that a funnel-shaped cloud appeared, but that it was not clearly defined; also that the trees lay in all directions, but principally to the southeast. However, the twisted condition of the trees, the plucked birds and fowls, the length and narrowness of the path, and the great destruction wrought, indicate clearly that the storm was a tornado. The path varied greatly, being as wide as 3 miles in places, but the worst effects were noted in a track about one-half mile in width. Intense darkness was reported by those directly in the path of the storm, and heavy rain and hail fell, some of the stones being as large as hens' eggs. The cooperative observer at Joliet measured a hailstone 1.25 inches by 3.92 inches. From its point of inception in La Salle County, the storm caused only minor damage until it reached Will County; but the towns of Manhattan and Monee and the rural sections east of Manhattan suffered severely, and east of Monee practically nothing was spared. The newspapers report a number of freakish results of the tornado, characteristic of storms of this nature. In Will County 3 lives were lost, 36 persons were injured, a number of houses and many farm buildings were totally destroyed and many more badly damaged. The loss to property was at least \$750,000.

The central tornado was remarkable, not only on account of its severity, but because of its great length. A severe hailstorm occurred at Louisiana, Mo., on the Mississippi River, and it is probable that the storm started about there, because the tornado cloud was first seen at Pleasant Hill, 8 miles east of Louisiana, at noon of the 26th. From this point it moved due east in a remarkably straight line through the counties of Pike, Greene, Macoupin, Montgomery, Christian, Shelby, and Coles, to Charleston; then bore to the southeastward through Clark County, and thence across three-fourths of Indiana, terminating near North Vernon in that State. It passed Pearl at 12:20 p. m., White Hall at 1:00 p. m., through Modesto at 1:30 p. m., past Owaneco at 2:20 p. m., through Westervelt at 2:50 p. m., Mattoon at 3:30 p. m., Charleston at 3:45 p. m., Marshall at 4:25 p. m., and ended its career beyond North Vernon, Ind. at 7:20 p. m. It covered 188 miles in Illinois and 105 miles in Indiana, or a total length of path of 293 miles in 7 hours and 20 minutes, or at an average velocity of translation of 40 miles per hour. This is the exact velocity of the northern storm. Across the State from the Mississippi River almost to Mattoon, all eye witnesses agree that the storm had the typical funnel-shaped tornado cloud with swinging tail, and east of Charleston the same type of cloud was reported, but the writer, who visited Mattoon and Charleston, failed to find anyone in those cities who saw a funnel-shaped cloud. Eye witnesses who were near the edge of the city, and had an unobstructed view, agree that the approaching storm appeared as a low, boiling mass of clouds, one part a little to the north and the other a little to the south. The parts seemed to roll toward one another, coming together and downward like the meshing of a pair of cog-wheels. There was an abundance of evidence of true tornadic action, as will be described later, and, in explanation, it might be suggested that the cloud was so low that there was no room for the usual pendant portion. The effects of the tornado were felt over a path more than one-half mile wide, but the path of serious damage, while varying considerably, was generally about one-fourth mile in width. The storm seemed to lift at times, causing little harm at some places in its path, but inflicting great destruction at others. The tornado passed 23 miles south of Springfield, close enough for a shower of leaves to fall in the south part of the city, but there was no local variation in the barometric pressure curve. Barograph and thermograph records are maintained at the State Normal School in Charleston, one mile south of the middle of the storm track. The temperature fell 16° and then recovered slightly. The barometer fell abruptly 0.27 inch and then rose immediately 0.40 inch, and quickly returned to the starting point. The precipitation was 1.81 inches, and large hail was reported.

The tornado first touched the earth at Nebo in Pike County, where 3 persons were injured and some property was damaged. It passed the towns of Pearl and White Hall at a distance of less than a mile, causing damage to farm properties in its course and injuring three persons. After leaving the vicinity of White Hall, no further damage was reported until Modesto, 22 miles distant was reached. This town, with a population of 300, suffered a loss of \$120,000. Three lives were lost, 16 persons were injured, 30 houses were destroyed, and 35 were badly damaged. The width of the path was reported as about 120 rods. The storm then traveled 50 miles through the rural sections, but the destruction in those parts was not great. The next town reached was Dunkel, where several houses and barns were destroyed, and at the neighboring town of Assumption a damaging hailstorm occurred. Some stones were 8 inches in circumference. From near Dunkel to Westervelt, a distance of 11 miles, the wind destroyed or wrecked almost everything in its path, and killed a boy in the country. Westervelt, a village of 200 population, lay directly in the path of the storm, and here all dwellings on both sides of one of the streets were damaged. In this town 5 lives were lost, 25 were injured, 10 houses were destroyed, and 9 badly damaged. The loss was approximately \$50,000. Leaving Westervelt there was no important damage until the tornado entered the narrow lower part of Moultrie County, from which place the damage increased until the storm struck Mattoon.

Mattoon is a city of about 15,000 population. The storm entered this city at

about 3:30 p. m. Previous to its approach the atmosphere became sultry and very oppressive. Rain began a few minutes before the storm broke, becoming heavy after the wind, and continuing for some time. Large hail accompanied the wind and it became quite dark. The tornado cut a swath across the extreme north part of the city a distance of 1-2 miles. For convenience the writer has divided the affected area into certain zones, according to the damage inflicted, the central path to be known as the zone of total destruction, on either side a zone of partial destruction, and beyond these would be zones of minor damage. The section was occupied by laboring people, and most of the houses were cottages or small dwellings, generally without cellars. There were some open spaces in the central zone, but the major portion was thickly populated. Throughout its length and over a path 2-1/2 blocks wide there was complete devastation. Scarcely a wall was left standing, and very few fallen walls were left intact, especially east of the Illinois Central Railroad. The buildings were reduced to kindling in every instance, and household effects were scattered into other localities or blown into the country. There were few remaining articles of any value, and aside from kindling and junk, the salvage will amount to very little. The zone of partial destruction on the south was 3-1/2 blocks wide and stretched 2-1/2 miles across the city, but on the north this zone occupied only a small arm of uninhabited area, considerable open country, and the cemeteries. In these zones houses were tipped about or unroofed, walls were torn out, but the destruction was only partial. Two manufacturing plants, a large modern school building, and a store or two were badly damaged. In the cemeteries tombstones were blown over and many valuable trees were ruined. There was little minor damage in the open country on the north, but this zone on the south was three blocks wide. In the business district and south side, the damage was confined to window glass and tree limbs. There was ample evidence of tornadic action. In most cases, the leaves, tops and branches of the trees were carried away, leaving only the gaunt trunks and heavier parts of the main limbs, but some trees were uprooted and others broken off. The broken trees showed twisted fractures. The path of the storm through Mattoon bore just a little north of east. Trees along the south edge of the main path mostly fell to the northeast, but some east and some north. No trees fell to the west in any part of the zone of total destruction, but they did fall to the west in the north zone of partial destruction. It is interesting to note that the southern limit of the zone in which the trees fell to the west coincides exactly with the northern limit of the zone of complete destruction. This indicates that the greatest wind force occurred on the south of the actual center of the whirl. Many of the buildings "exploded", all walls falling outward. Many interesting and peculiar circumstances were related by the survivors. The writer saw a piece of wood driven through a telegraph pole, and receipts and an insurance policy were found in Indiana, more than 50 miles away. The numerous instances of escape from death or serious injury are most remarkable. Persons in houses that were totally destroyed, the debris being scattered over the neighborhood, were uninjured. To view the scene of destruction, one would think it impossible to pass through it without injury, but many did. The destruction in any one place probably occurred in about 40 seconds, but the wind blew hard for a considerably longer time. All public services in the affected area were out of commission. The statistics for Mattoon are: Lives lost, 53; number injured, not less than 400; houses demolished, 496; houses partially wrecked, 134; minor damage, 150; number of persons homeless, 2500; business institutions wrecked, 5; loss to buildings, \$900,000; to personal property, \$300,000.

From Mattoon to Charleston, a distance of 11 miles, every farm suffered the loss of, or serious damage to its buildings. The little town of Loxa escaped without much damage. Entering Charleston on the west, the tornado cut through the city much as it did Mattoon; but the path here was closer to the business section. Charleston is smaller than Mattoon, but here business interests were hard hit. The path through Charleston was one and one-half miles in length, and varies from 1200 to 1800 feet in width. The storm moved in a direction north of east, through a district that was largely commercial but mainly residential. Here, as in Mattoon, the houses were of the poorer type, but there was no zone of total demolition, perhaps because the houses were better built. In this path the damage varied from total destruction to minor damage, and all gradations occurred in the same neighborhood. Two lumber yards and both railway stations were destroyed, and the high school building, electric power station, and gas reservoir were badly damaged. The city was without gas and electricity for several days. A fine grove of large trees at the Fair Grounds was almost ruined, and an excellent opportunity was here presented to study the action of the wind. All fallen trees exhibited a twisted break, instead of a straight fracture. South of the middle of the path the trees fell to the east and northeast; directly in the middle, to the north and the south; and on the north side of the track they fell to the northwest and west. Two brick buildings near the public square, and outside the main track, were quite badly damaged, and trees suffered over the entire city. The statistics for Charleston are: Lives lost, 38; injured, 182, of whom 72 required nursing care; homes destroyed, 221; homes seriously damaged, 265; families homeless, about 285; business buildings damaged, 15; damage to buildings, \$631,000; personal property loss, \$150,000.

After leaving Charleston the storm moved slightly south of east, passing through the northern part of Clark County and entering Indiana. East of Charleston two persons were killed. The edge of Marshall came within the path, and some damage and personal injuries occurred there. Most of the buildings in the little town of Livingston were wrecked, and several persons were injured. The property damage for Clark County is \$150,000. A summing up of the results of the entire central storm shows a toll of 101 lives, the injury of 638 persons, and a property loss of \$2,500,000.

In the late afternoon of May 27th, tornadic storms occurred in southwestern Illinois. At 5 p. m. a storm a few miles east of Chester blew down buildings, injuring people, and killing one man. Large hail fell in Chester, damaging glass and roofs. At 5:40 p. m. a tornado, with a funnel-shaped cloud, struck Willisville, injuring five persons and causing \$30,000 damage, and there was some damage at Hallidayboro at 6:30 p. m. A number of local storms, believed to have been straight blows, caused the death of five persons in Alexander and Pulaski counties during the night of May 30th-31st. The property loss probably amounted to at least \$200,000.

Although there was some damage to crops during the May storms, the losses were not great. Corn was just coming up, and grain crops did not suffer materially. Farm orchards in the path of the storm were damaged or destroyed, but fortunately, the tornadoes did not pass through any of the important fruit growing sections. Many head of live stock were killed.