

*Circular 88*

STATE OF ILLINOIS  
DEPARTMENT OF REGISTRATION AND EDUCATION



*History of the Urbana Weather Station*  
1888 - 1963

by S. A. CHANGNON, JR., and G. R. BOYD

ILLINOIS STATE WATER SURVEY  
URBANA  
1963



## HISTORY OF THE URBANA WEATHER STATION 1888-1963

by S. A. Changnon, Jr., and G. R. Boyd

### INTRODUCTION

On August 17, 1888, an observer whose name is now unknown read the brand-new weather instruments and logged the first entry for the record book of the Urbana campus weather station.

The Urbana weather station on the campus of the University of Illinois, now called the Morrow Plots Weather Station, has an interesting history. The station is one of the oldest University installations still in operation, and it is unique in comparison with other weather stations in Illinois.

This chronicle of the campus weather station concerns not only the types of weather data which have been collected but also the persons who operated the station and the instruments used to collect the data. The factors which tie these facets of the past together are the reasons for the station's existence.

Initially the campus station was established to obtain weather data for agricultural experiments, but in ensuing years it has become also a source of weather data for the entire University, the local urban community of Champaign-Urbana, and the U. S. Weather Bureau.

If for no other reason, this history is worth compilation because it relates a story of human endeavor and scientific interest which were inherent in the station operation and the exhaustive recording of data. We now possess a valuable scientific legacy in these records, and this is largely due to the foresightedness of a few early University staff members and to a willingness on their part to expend considerable time and effort to collect and record weather information day after day.

The station opened on August 17, 1888, and now is in its 75th year of continuous operation. Only 12 other locations in

Illinois have longer continuous records of the weather, and none of these stations has remained in a location as near its Nineteenth Century installation as has the Urbana campus station. Thus, the campus weather station including its resulting data is unique.

In 1963 the campus station was selected by the U. S. Weather Bureau as a Bench Mark station for the study of past and future climatic changes in the United States.<sup>1</sup> Approximately 15 such stations east of the Rocky Mountains have been selected because of long continuous records at or very near the same site.

It was not difficult to reconstruct one phase of the campus weather station history -- the actual weather records. These voluminous records which are mostly complete are in the possession of the Illinois State Water Survey, the present supervising agency. Inasmuch as the weather station and other related operations were begun on a large scale to serve many potential purposes, which again reflects the acuity of the founders, the local weather records are quite extensive and cover many phases of measurement not found at any other locality in Illinois.

For instance, by December 1, 1888, local daily measurements were made of maximum and minimum air temperatures, dew point temperatures, soil temperatures at six depths, relative humidity, solar radiation, evaporation, evapotranspiration, wind speed and direction, skycover (observations), rainfall, snowfall, and pressure. And, many of these elements were measured three times each day, at 7 AM, 2 PM, and 9 PM.

Extensive summaries and reports based upon or using portions of these data were prepared in 1903,<sup>2</sup> 1918,<sup>3</sup> 1949,<sup>4,5</sup> 1954,<sup>6</sup> and 1959.<sup>7</sup> In these reports most of the weather data recorded during the past 75 years are summarized for use in research and other activities. These reports are suggested to the interested reader for more details.

Unfortunately, the detailed original weather records contain practically no information on the types of instruments used, the men who observed the weather and recorded the data, or the locations of the equipment. No station history concerning these facts was available in any prepared form. Therefore, the annals of the weather station related to equipment, personnel, and site had to be determined by searching a number of information sources. Many of these facts could only be found through indirect methods by interrogating older local inhabitants, reading University correspondence of the period, examining old technical articles, publications, and photographs, and analyzing handwriting and charts of the original weather records.

Most of this text is devoted to describing the history of the station equipment, sites, and personnel, and how these facts were reconstructed. Mention also is made of other efforts by the College of Agriculture, Agricultural Experiment Station, and Illinois State Water Survey to collect weather data at various locations in the campus area in the years since 1888.

The station's history is here treated in four eras, the beginning and end of which were defined by major changes in station operation, or supervision, or both. The first era extends from 1888 to 1897, the second era from 1897 to 1931, the third era from 1931 to 1948, and the fourth era from 1948 to the present.

### **Acknowledgments**

This report was prepared under the general direction of William C. Ackermann, Chief of the Illinois State Water Survey, and under the supervision of Glenn E. Stout, Head of the Meteorology Section.

This history could not have been compiled without the extensive efforts of many present University staff members. Dr. Elmer Roberts of the College of Agriculture graciously permitted examination of the early official correspondence of the College, and furnished valuable suggestions and photographs. Dr. Icho Eben, Archivist, was quite cooperative in allowing the perusal of old issues of the Board of Trustees Reports, the file of old glass slides and photographs, and early issues of local newspapers. Professor L. B. Miller of the College of Agriculture helped with many suggestions as to possible locations of early station information and data. Personnel of the University architecture office availed the University files on buildings and old campus maps. Mr. F. A. Huff of the State Water Survey supplied useful information about the 1940-1950 station activities.

The one person whose information was of the greatest value in establishing facts on early sites and personnel was Mr. Claude C. Chapman of Urbana. Mr. Chapman, who is presently 88 years old, began working for the Agricultural Experiment Station in 1895 and remained on the departmental staff until 1939. Without his detailed recollections this history could not have been completed satisfactorily. Others too numerous to mention helped immeasurably with items of information for the compilation of this history.

## FIRST ERA: 1888-1897

The decision to operate a weather station on the campus was made in March 1888, but the events that made this decision possible originated a year earlier. On March 2, 1887, the Congress of the United States passed the "Hatch Act" which authorized federal support to establish agriculture experiment stations at land-grant colleges. Six days later, March 8, 1887, the University of Illinois Board of Trustees agreed that the University should establish such a station; and in May 1887 the Illinois General Assembly gave "legislative assent" to an experiment station. On March 13, 1888, the final plans for the Agricultural Experiment Station, which included a weather station as an adjunct to the experimental studies, were approved by the Board of Trustees.<sup>8</sup>

Nearly \$200 worth of meteorological equipment was ordered from the H. J. Green Company of New York on June 19, 1888.<sup>9</sup> (See Appendix A for itemized list of early equipment purchases,) In July 1888, sample forms of weather record log books were requested from General Greeley of the U. S. Signal Service, and weather record books were then ordered from the Pantagraph Company of Bloomington, Illinois. All of the various weather instruments were installed at a site on the "North Farm" area by August 16, 1888, and the detailed weather records began the next day. The making of the observations of weather conditions and the recording of these observations were performed as Experiment No. 76 of the Agricultural Experiment Station.<sup>10</sup>

The first day of weather observation was warm and humid. The temperature on August 17, 1888, ranged from a high of 84 degrees to a low of 64. The humidity at 7 AM was 91 percent, and although it had dropped to 69 percent by 2 PM, it was up to 100 percent at 9 PM. Since there was essentially very little wind movement and a clear sky most of the day, it was a typical warm, muggy August "dog day" that weather observers and local residents have often experienced in the past 75 years. Day by day entries on the first page of the original log are presented in figure 1.

### First Site

The instrument shelter, raingage, and tubes for six soil thermometers were installed inside a fence in a grassy area

# Daily Report

Experiment No. 76

3

Agricultural Experiment Station,  
University of Illinois.

188

Assistant

Day	Precipitation				Wind					Clouds			Weather			
	Time of	Time of	Total	Average	A.M.		P.M.		P.M.	7	P.M.	P.M.	A.M.	P.M.	P.M.	
	beginning	ending	in inches	falling in inches	Dir	Force	Dir	Force	Dir	Force	Force	Force	Force	Force	Force	Force
17					n.w.	1	n.w.	2	n.w.	1				clear	clear	cloudy
18					w.	1	n.e.	2	n.e.	1				clear	"	clear
19					e.	1	s.e.	1	s.e.	1				clear	"	"
20	12 M.	6 P.M.	0.1	0.1	s.e.	1	s.e.	2	e.	2				cloudy	cloudy	cloudy
21	6 P.M.	10 P.M.	0.1	0.1	n.e.	2	n.	2	n.	2				"	"	"
22					n.e.	2	n.e.	2	n.	1				clear	clear	clear
23					n.e.	1	n.e.	1	e.	1				"	"	"
24					s.e.	1	s.w.	1	s.w.	1				"	"	"
25					s.w.	1	s.w.	2	s.w.	2				"	cloudy	"
26					s.w.	1	s.w.	1	s.w.	1				cloudy	"	cloudy
27					n.w.	1	n.w.	2	n.w.	1				clear	"	"
28					e.	1	e.	1	e.	1				"	clear	clear
29					e.	1	e.	1	e.	1				"	"	"
30					e.	1	e.	1	s.e.	1				"	"	"
31					n.w.	2	n.w.	3	n.e.	3				cloudy	cloudy	cloudy

Day	Temperature												Dew Point				Relative Humidity				
	7 A.M.			2 P.M.			9 P.M.			7 A.M.		2 P.M.		9 P.M.		7 A.M.		2 P.M.		9 P.M.	
	High	Low	Mean	High	Low	Mean	High	Low	Mean	High	Low	Mean	High	Low	Mean	High	Low	Mean	High	Low	Mean
17	72	70	69	71	84	72	70	69	68	68	68	103	73	86.7	84	64					
18	67	61	68	76	81	71	66	61	68	66	65	90	71	78.0	81	67					
19	68	60	67	77	86	76	71	63	67	68	67	94	67	78.7	85	61					
20	64	63	62	75	69	69	69	100	70	69	67	82	69.7	72.3	72	62					
21	64	64	64	100	80	78	77	92	67	66	66	76	69.6	76.7	81	64					
22	67	65	64	88	71	62	66	60	61	61	61	100	62.6	82.7	71	49.6					
23	48	47	46	70	76	62	62	44	66	63	61	82	67	73	84	57					
24	61	58	46	74	80	68	60	66	64	63	62	94	63	74.7	84	46					
25	69	65	63	71	86	76	71	63	65	66	66	100	66	81.3	88	48					
26	70	69	69	96	84	77	74	73	71	70	70	96	74	87.6	87	64					
27	70	69	69	76	82	74	71	69	70	69	69	76	73	86.3	82	63					
28	68	60	69	89	77	66	67	60	64	62	61	94	67	76.3	80	64					
29	62	67	67	84	84	70	63	49	64	62	61	88	63.6	70.7	84	48					
30	63	61	60	87	86	72	66	60	60	62	68	74	67	78.7	86	61					
31	70	66	64	81	69	63	69	72	66	63	61	86	67.7	79.3	70	60					
Mean	64.0	61.8	60.8	81.8	79.8	70.3	66.8	64.3	63	61.6	60.7	92.8	67.1	69.6	81.4	63.6					

FIGURE 1. AUGUST 1888 DAILY WEATHER RECORDS.

about 100 feet east of the Veterinary Hospital, a location close to the present southeast corner of Lincoln Hall. An east-west row of 20-foot high evergreens was located 40 feet south of the equipment, and the exposure was adequate for weather measurements. Record books were kept in a warehouse, one that had been built especially for the new experiment station, located about 300 feet south of the equipment and near a very large sycamore tree which remains standing in this year.

Figure 2, which is a composite map of the campus showing the original buildings<sup>11</sup> and some present ones, reveals the details of the various locations. An 1892 picture of the Veterinary Hospital, figure 3, was taken a few feet west of where the shelter, raingage, and soil thermometers were located. The station site was chosen because it was atop a slight rise in the ground which "afforded good water and air drainage to the north and south of it"<sup>12</sup>.

This location, in what is now the heart of the campus area, was far removed from most campus buildings and activities in the 1888-1900 period. The area west of Burrill Avenue, known in 1888 as the "central driveway," was used for horticultural experiments; agricultural experiments were performed east of the drive. This total area was part of the "North Farm," as opposed to the South Farm which is the present University agricultural area lying south of Pennsylvania Avenue.

### Data Collection

During this entire first era all daily maximum and minimum temperatures, precipitation, and snowfall values were based on conditions in the 24-hour period from 9 PM to 9 PM. At the 7 AM, 2 PM, and 9 PM observation times, measurements of the soil, air, and dew point temperatures, relative humidity, wind, and pressure were made along with observations of the sky conditions. As mentioned before, the written records for these data were kept at the Experiment Station warehouse, where they remained until Davenport Hall was opened in September 1900.

Soil temperatures were measured three times daily from August 17, 1888, under station Experiment No. 73, until this experiment ended on December 31, 1896.<sup>11</sup> During this period soil temperatures were measured at depths of 1, 3, 6, 9, 12, and 36 inches. Beginning on July 1, 1897, a similar collection of soil temperature data at the same depths began, for which the tubes were located inside a pen near a new raingage site



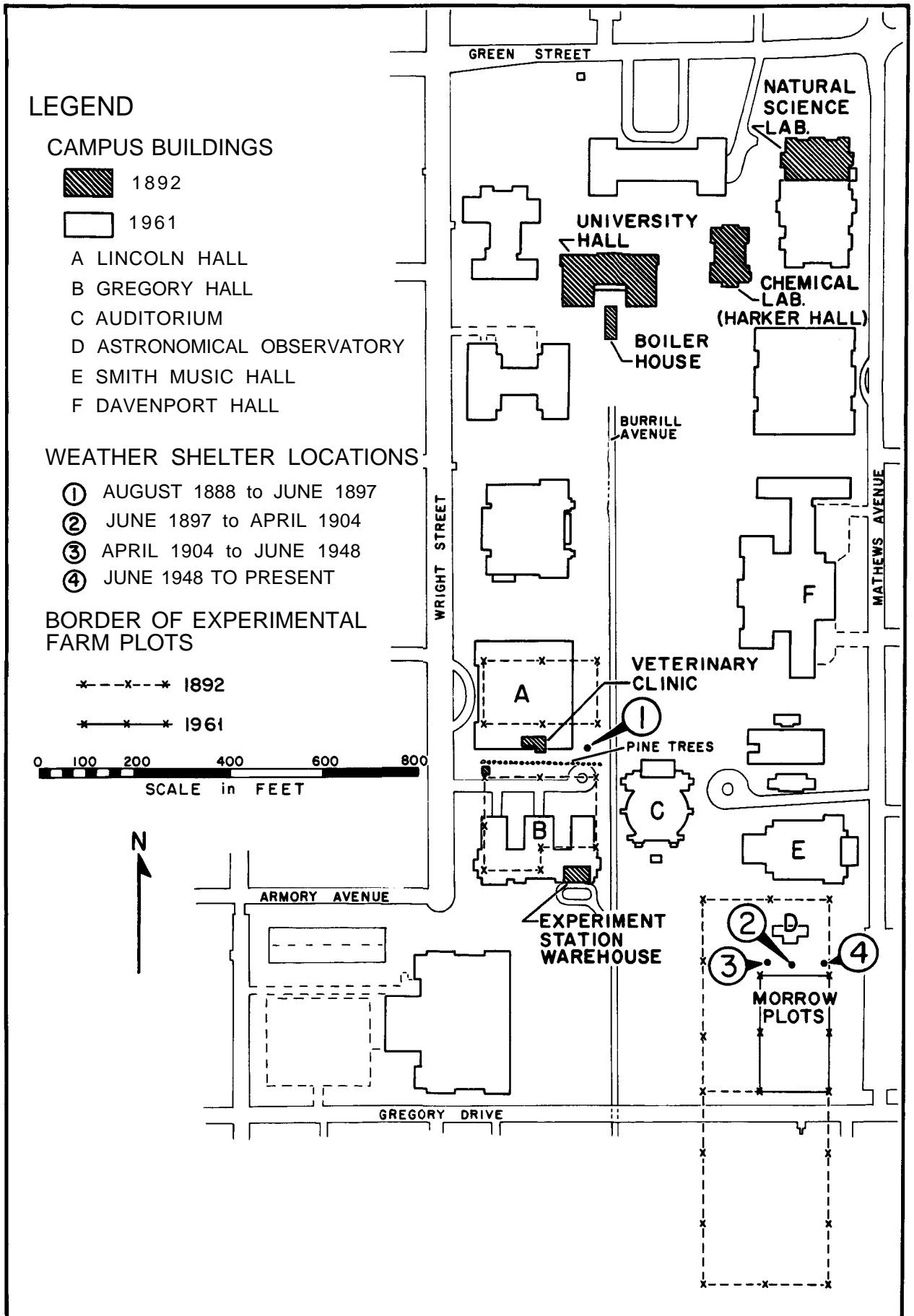
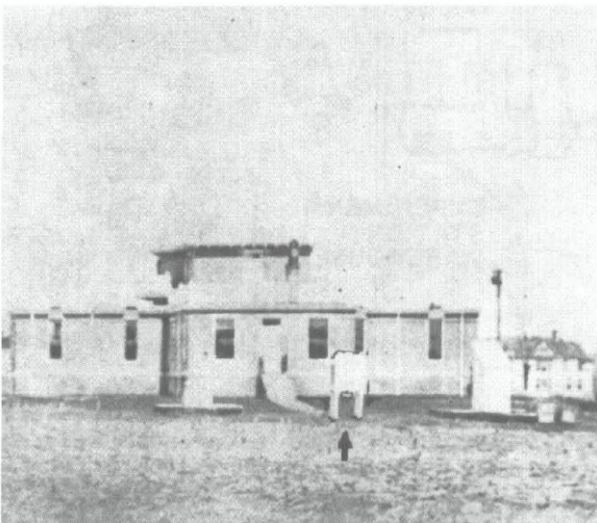


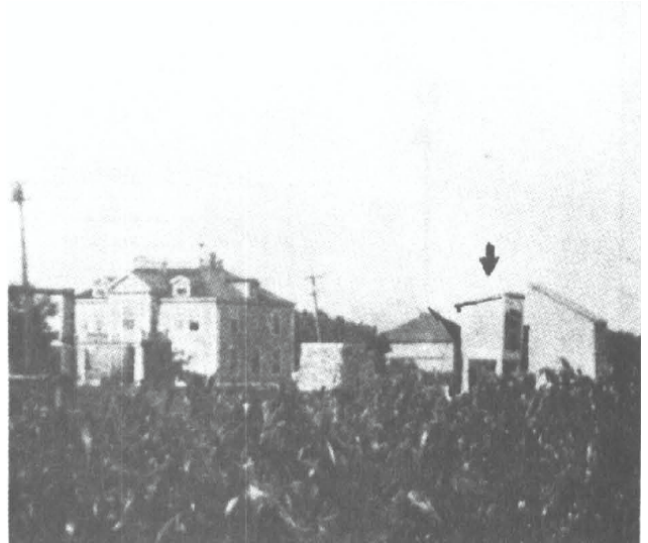
FIGURE 2. WEATHER STATION SITES SINCE 1888 AND NEIGHBORING CAMPUS BUILDINGS AND GROUNDS IN 1892 AND 1961.



FIGURE 3. VIEW OF VETERINARY HOSPITAL LOOKING WEST FROM NEAR THE FIRST SITE OF CAMPUS STATION.



a. Looking North



b. Looking Northeast

FIGURE 4. 1903 PICTURES OF THE SECOND SITE OF THE CAMPUS WEATHER STATION. ARROWS DENOTE SHELTER.

southwest of the Astronomical Observatory (fig. 2) and about 40 feet northwest of the second shelter site. No other weather records were discontinued while the station was being moved.

### Instruments

The types of weather instruments bought and installed in 1888 were of the better quality available at that time, and the data collected from them is compatible with similar weather data being gathered in 1963. The raingage was an 8-inch standard nonrecording gage (Green Co. type-332) identical with the type presently used throughout the United States. The H. J. Green Company's liquid-in-glass air thermometers in 1888 also were comparable to those in use today.

The maximum and minimum thermometers were installed in a wooden shelter mounted on a wooden base which kept the bottom of the shelter four feet above the ground. The louvered shelter and base were constructed locally. Pictures of the instrument shelter and base taken in 1903 (fig. 4) reveal them to be in both size and construction nearly the same as those in present use locally and throughout the country. The first shelter was used continuously from 1888 to 1948. (The same shelter is pictured in figures 4, 6, and 9, and also in a recent Water Survey publication.<sup>7</sup>) The soil thermometers were the type placed in glass tubes which had been inserted through the sod and on into the soil.

After the initial large purchase of equipment in 1888, the following few years of station operation were marked by numerous replacement purchases of meteorological instruments.<sup>8</sup> Evidently, breakage of the unfamiliar, predominately glass equipment was quite frequent. By 1893 such purchases of replacement equipment had diminished (Appendix A).

### Evapotranspiration Experiment

Studies of evaporation from water surfaces and evapotranspiration from different soils also were conducted during the 1888-1890 period as Experiment No. 75. The equipment was located in the immediate area of the weather shelter.<sup>13</sup> Experiment 75 is unique because it represents one of the earliest

known measurements of evaporation and evapotranspiration in the United States.<sup>14</sup> Since the Water Survey possesses the only known record of the experiment, a brief description of the measurement program is here included.

Five cans, as depicted in figure 5, were constructed and then placed in a special wooden box buried in the ground with the box top at ground level. The tops of the cans protruded through openings cut in the box lid and were flush with the ground surface. Each can was filled with a different material -- water, uncultivated soil, cultivated soil, soil containing a corn plant, and sod.

The experiment began by pouring one-half pound of water in the top of each can and another one-half pound in the reservoir (fig. 5). Once the experiment had begun, water was added only to the reservoir. The soil in the can with cultivated soil and in the can with the corn plant received daily cultivation, by hand, except when the surface was wet "on account of rain."

The five cans were removed from the box each day for weighing. Comparison of this weight with the quantity of water added to the reservoir allowed computation of the amount of water lost through evaporation or evapotranspiration. No measurements were made on days when precipitation occurred, "it being deemed best to omit the observation rather than to calculate the difference caused by the known rainfall." A recent examination of the experiment by Water Survey meteorologists revealed that the results are quite comparable with those obtained in similar evaporation measurements at present.

### Personnel

Names of all the persons making the observations from 1888 through 1898 are not known. A detailed listing of known observers is presented in Appendix B. Mr. W. L. Pillsbury, Secretary for the Experiment Station, supervised the weather station operation in the initial years. He also recorded the weather data in the log books from 1888 to 1894, and ordered all the meteorological equipment that was purchased. In 1894 Mr. Pillsbury became the first Registrar for the University of Illinois,<sup>15</sup> and the assignment of these additional duties is believed to be the reason for the end of his service as station supervisor and recorder on April 30, 1894.

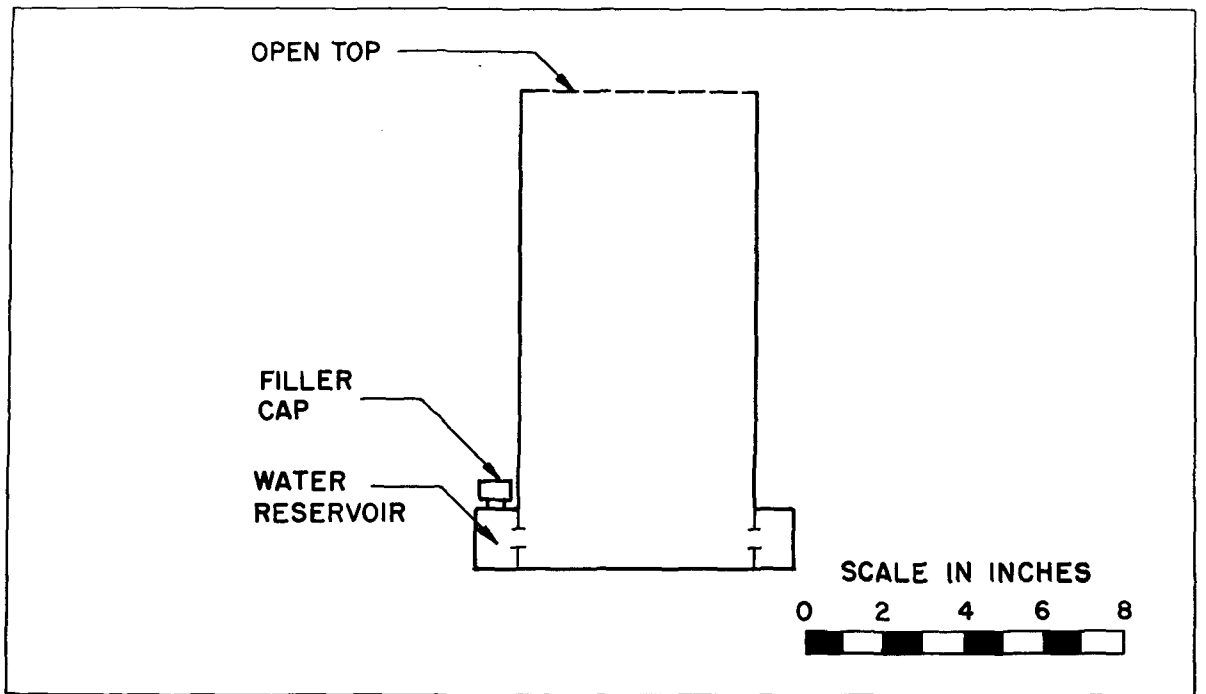


FIGURE 5. INSTRUMENT CAN USED TO MEASURE EVAPOTRANSPIRATION.

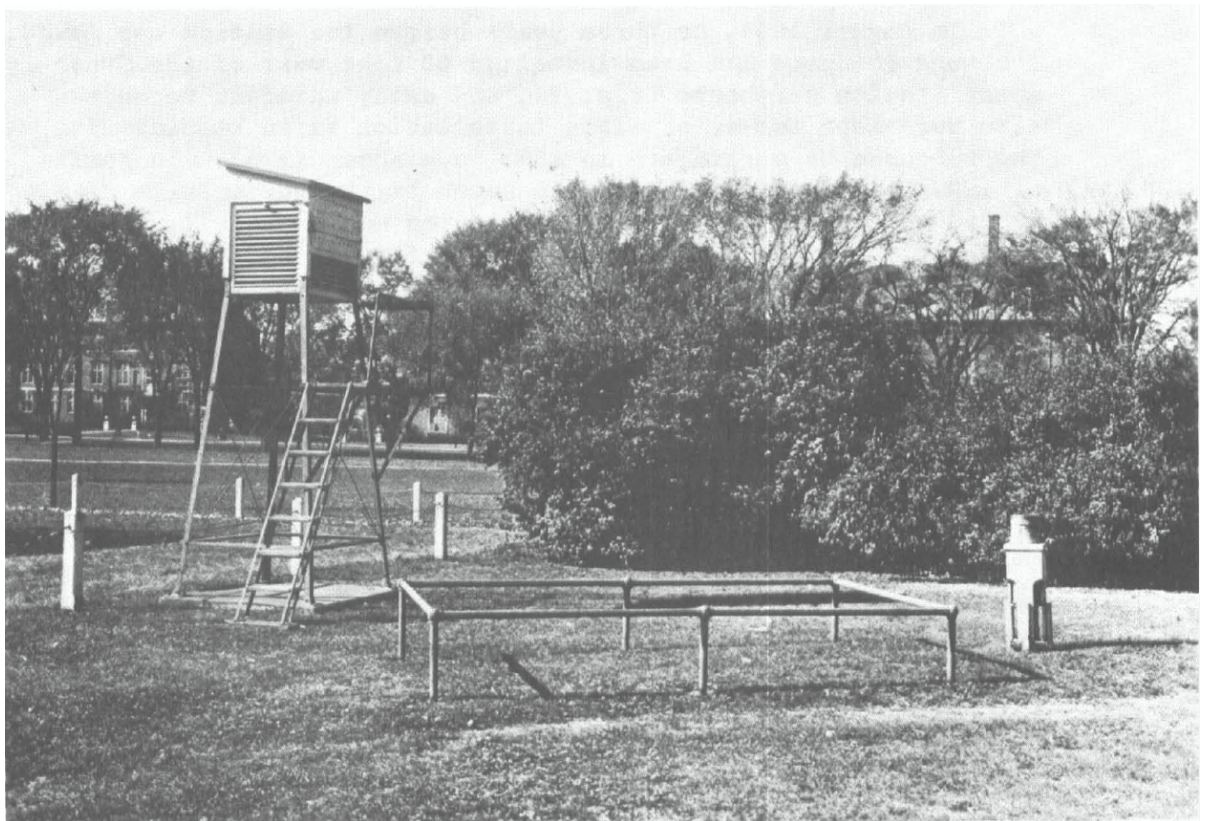


FIGURE 6. CAMPUS WEATHER STATION INSTALLATION IN 1932, LOOKING SOUTHWEST. THIS WAS THIRD SITE OF SHELTER, BUT ONLY SECOND SITE OF RAINGAGE. ENCLOSURE FOR SOIL THERMOMETERS LIES BETWEEN SHELTER AND RAINGAGE.



From the date Mr. Pillsbury's recordings ended until the station was moved in June 1897, two different observers were involved in the station operation and data recording, but their names are unknown. In fact much of the information about observers prior to 1900 had to be determined by examining changes in handwriting in the record books because no other sources of information could be found.

### First Relocation of Station

By the end of 1896 Experiment No. 73, which was concerned with studying soil and air temperature relationships, was terminated.<sup>12</sup> Probably other events occurring in 1896-1897, some of which are unknown to the authors, caused the site of the weather station to be shifted in June 1897. The instrument shelter, raingage, and soil thermometers were moved approximately 700 feet to the southeast. This new location (figs. 2 and 4) was in the sodded area behind or south of the Astronomical Observatory which had been constructed in 1896.<sup>8</sup> A picture taken in 1898 verifies the location of the shelter at this time.<sup>16</sup>

In August 1894, or three years before the station was moved, a second raingage had been installed 60 feet west of the Experiment Station warehouse (fig. 2) and daily rainfall records also were kept for it.<sup>10</sup> This installation is in keeping with the purchase of a raingage in 1893 (see Appendix A). In April of 1897 this second raingage was moved to the new station site behind the observatory. Thus, for three months (April-June) comparative rainfall records were kept for the old and new station locations, a fact that is important today as verification of record continuity. These rainfall data indicate no significant difference; the 3-month total from the raingage at the new site was 10.58 inches compared with 10.64 inches from the gage at the old site. At the new site, the new raingage was permanently placed about 40 feet northwest of the instrument shelter, and the soil thermometers were put near the raingage and within an iron-pipe fence (fig. 6).

Looking back, we can surmise that the weather station was moved because: 1) the use of the horticultural experiment fields surrounding it was terminating as the result of changes within the University and its southward growth; and 2) the eastern fields, which encompassed the present Morrow Plots, were being more definitely recognized as the "permanent" agricultural plots

on the North Farm. Mr. C. C. Chapman informed the authors that the fields around the early station had become overgrown with weeds and grass in 1896 indicating a lack of use by that time.

The Morrow Plots area has been in continuous use since 1876 for growing corn. However, it was not recognized as definite experimental plots until the Agricultural Experiment Station was formed in 1888; and, although at that time the Morrow Plots included ten 1/2-acre plots, these were just a few of the many cultivated areas in the North Farm. Even in 1888 these plots were considered "too far" from the Experiment Station building, offices, and major activities in horticulture to rate the nearby installation of the weather equipment.

However, eight years later in April 1896, the selection of the site for a new astronomical observatory created a minor furor among agriculture staff members because this site occupied the northern part of the 10-plot area.<sup>17</sup> The location was approved, however, and the two northern plots were removed from planting. Mr. C. C. Chapman actually plowed these two plots in the spring of 1896, and he recalled the dissension between those who built the observatory and the Agriculture Station personnel who used plots 1 and 2.

Thus by the time the observatory was completed in August 1896, Agricultural Experiment Station staff members had recognized the need to protect these plots from further incursions, and began to identify them as long-term, permanent agricultural experimental fields. Nonetheless, the five southernmost 1/2-acre plots were discontinued in 1903, leaving only plots 3, 4, and 5 of the original ten.<sup>17</sup> In the spring of 1904 these remaining plots were narrowed from 16 to 9 rods and were then enclosed by permanent fencing such as presently surrounds them. The site of the campus weather station still occupies ground along the northern boundary of plot 3; thus, the campus weather station has become known in recent years as the Morrow Plots Weather Station.

With the move of the weather station in 1897, the first era of its history closed. The keeping of very detailed weather records, which was begun in 1888, had set a pattern for the exhaustive record keeping which has prevailed to the present day (note summaries in Appendix C), and this is undoubtedly the major contribution of the personnel of the first era. The high quality of the records and the scientific interest and integrity evident in the original records and experiments reflect highly upon those associated with the station operation and supervision.

## SECOND ERA: 1897-1931

The second era of the station began on July 1, 1897, and terminated on July 31, 1931. Significant to the second era, in addition to a minor move of station equipment in 1904, was an even greater interest in the weather station and collection of weather data. This interest was generated largely by Professor J. G. Mosier, and to some extent by Professor E. Davenport who was responsible for obtaining many recording-type meteorological instruments for the station in the 1901-1903 period.

This second era was further marked by the incorporation of the station into the U. S. Weather Bureau's cooperative climatological station network in 1902. Also, a man with the permanent assignment as weather observer was hired by the University for the first time in 1911. In 1913 the station became a daily contributor to the Weather Bureau's national telegraphic reporting network.

It is worthy of mention that two of the worst storms to strike Champaign-Urbana since the records began in 1888 occurred during the second era. The first, a severe wind storm, occurred at midnight on June 10, 1902. Described as a "terrible typhoon" in the local newspapers, this storm resulted in the only loss of precipitation data from the Urbana station in its 75 years of operation. An entry in the station record for June 11 states "gauges blown off," and a footnote adds, "rain gauge blown 100 feet into cornfield." The severe weather system which produced the local storm moved from the southwest and devastated the entire central portion of the state. Local residents who experienced the storm stated that it was the worst storm in memory. Large numbers of trees and buildings were severely damaged.

Probably the worst hailstorm ever experienced in the local area occurred on April 4, 1927. Figure 7 is a photograph of three hailstones from this storm, the largest of which measured approximately 4 inches in diameter. These are the largest hailstones to have occurred locally since records began in 1888. This hailstorm began in mid-afternoon and resulted in more than \$100,000 damage in Urbana, although damage in Champaign was much less. Greenhouses in Urbana and at the University lost approximately 40,000 square feet of glass and suffered 50 percent or greater damage to interior plantings. Nearly 1000 street light globes and lamps were broken in Urbana, and it was estimated that at least 50 percent of the houses suffered one or more broken windows. The Champaign News-Gazette of April 5, 1927, stated



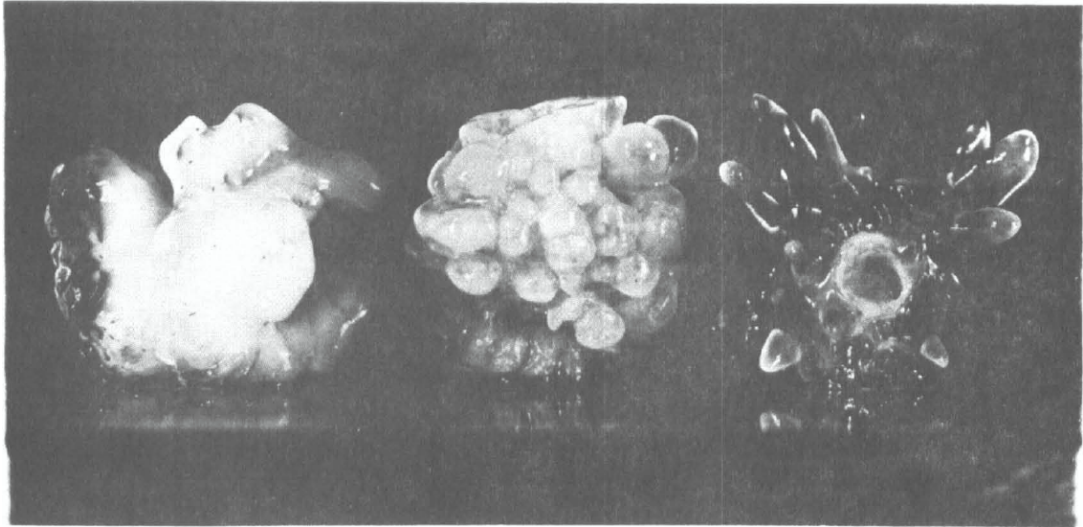


FIGURE 7. HAILSTONES COLLECTED ON CAMPUS, APRIL 4, 1927.  
(COURTESY DR. E. ROBERTS)

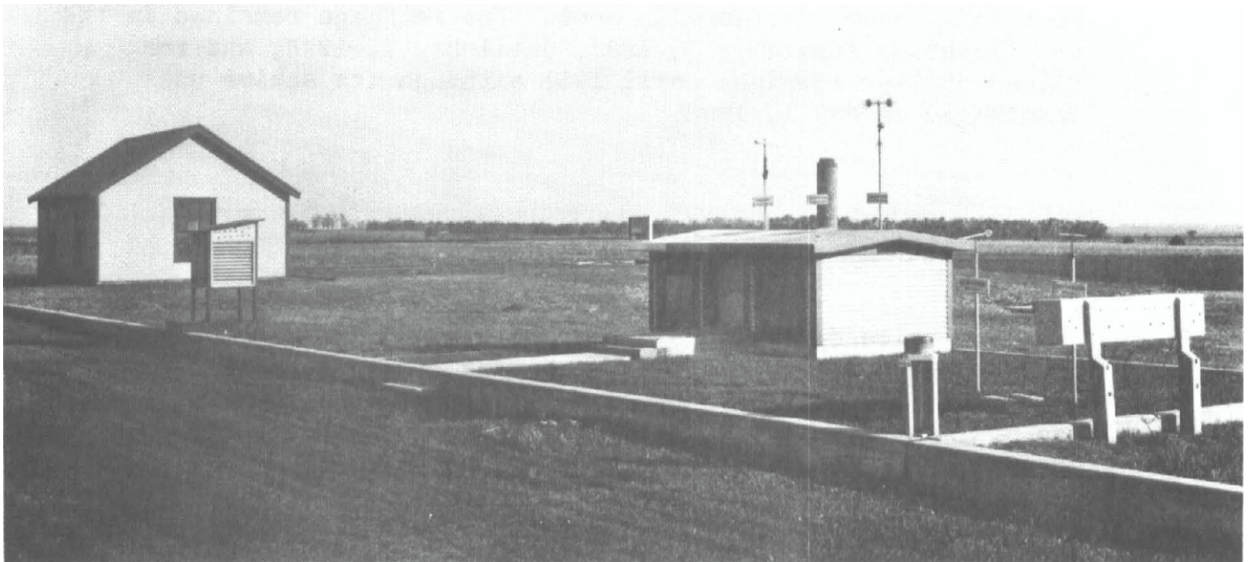


FIGURE 8. SOUTH FARM WEATHER STATION IN OCTOBER 1932,  
LOOKING SOUTHEAST.

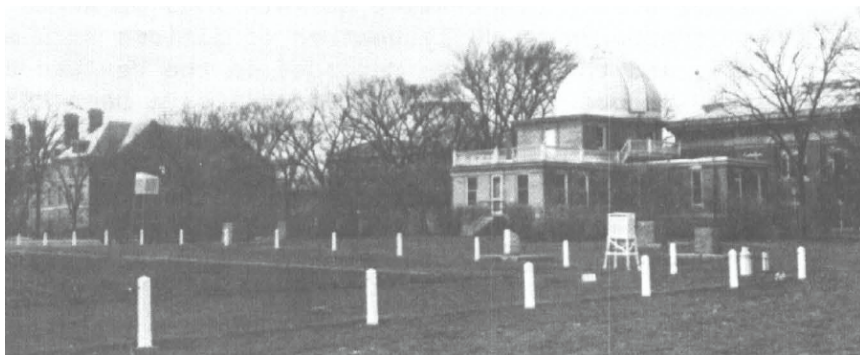


FIGURE 9. THIRD AND FOURTH SITES OF CAMPUS MORROW PLOTS WEATHER  
STATION, LOOKING NORTHWEST, 1950.

that the stones "drove holes through home and auto roofs," and the Urbana Daily Courier mentioned that City Clerk C. B. Holmes found a record 36 holes in the top of his auto.

### Site

The weather shelter remained in its second location until 1904 when the three remaining plots of the Morrow Plots were fenced. On April 11, 1904, the wooden shelter was placed on top of a 10-foot high steel base which had been constructed on a concrete platform located 60 feet west of the shelter's location from 1897 to 1904 (figs. 2, 4, and 6). The nonrecording raingage and soil thermometers were not moved from their 1897 position. As shown in figure 6, the soil thermometer tubes were kept in a fenced rectangular area. The raingage remained in the same location from July 1, 1897, until May 1, 1948, and the raised shelter remained until 1951 although its active use terminated on May 1, 1948.

### Data Collection

The trice daily measurements of air and dew point temperatures, relative humidity, wind, and pressure continued throughout this 34-year era, in addition to measurements of the daily maximum and minimum temperatures, precipitation, snowfall, and observations of the sky conditions. Soil temperatures at six depths (1, 3, 6, 9, 12, and 36 inches) also were measured three times a day from July 1, 1897, through 1924, and temperatures at a depth of 60 inches were added from April 1, 1919, through May 6, 1923. However, in 1913 the 9 PM readings were changed to 7 PM.

After the inclusion of the campus station as one of the U. S. Weather Bureau cooperative sub-stations on August 1, 1902, the occurrence of daily weather conditions such as fog, sleet, hail, and thunder were recorded on the Weather Bureau's 1009 monthly record forms. These records have been kept continuously since 1902.

From 1888 until 1913 the daily values for maximum and minimum temperatures, precipitation, and snowfall, as entered in the original station records and in the Weather Bureau 1009

records, were based on the 24-hour period from 9 PM to 9 PM. However, beginning in 1913 two changes in the observational program occurred. First, on February 5, 1913, the 9 PM observation of weather, which had been started in 1888, was discontinued and replaced by a 7 PM observation. Second, beginning in March 1913 and continuing through 1918 all daily values of temperature extremes and precipitation for the April-October periods were measured on a 7 AM to 7 AM basis. Then starting in 1919 and continuing throughout the second era, all daily maximum and minimum temperatures and weather conditions were measured on a 7 PM basis; however, from 1919 through 1935 the daily precipitation values for the April-September seasons were measured at 7 AM.

Continuous chart records of temperature in the shelter were made from October 19, 1903, until the present. Continuous records of pressure also began in 1903, and continuous chart records of relative humidity were made during the 1910-1921 period. The relative humidity data were recorded on the same chart as the temperature data by means of a modification to the thermograph. Automatically recorded sunshine, wind, and rainfall data began on February 6, 1904, and continued into the third era.

In February 1913 the campus weather station became one of the stations in the national network of special meteorological stations which daily telegraphed weather data to the Weather Bureau.<sup>18</sup> Information sent in at 7 AM each day included maximum and minimum temperatures, 7 AM pressure and temperature, wind and state of the weather in the preceding 12 hours, and the 24-hour precipitation total. The date of the termination of this activity is unknown, although 1918 may have been the last year.

### Instruments

On October 19, 1903, the first recording weather instrument was installed locally. This was a clock-driven Friez thermograph which made a continuous record of the air temperature inside the weather shelter. This thermograph was modified and made into a recording hygrothermograph on November 7, 1910. However, the use of the hygrothermograph terminated on October 31, 1921, and the thermograph records resumed on that date and continued beyond the end of the second era.

In 1903 a Triple Register, manufactured by the J.P. Friez Company, was obtained in order to have an automatic record of sunshine, precipitation, and wind data. The recorder and exterior weather instruments were installed late in 1903, but the operation began in February 1904. The recording raingage and other exterior sensing elements (pyrheliometer and anemometer) were installed on the center roof of Davenport Hall (fig. 2). The raingage was not operated during the November-March<sub>4</sub> period of each year because of problems with freezing weather. The Triple Register was maintained on an operational basis from 1904 until late 1947, and a report based on an analysis of some of the rainfall data collected with this instrument is available.<sup>5</sup>

A barograph to record pressure was installed in an office in Davenport Hall on October 23, 1903, and this instrument was used until October 31, 1921.

### Personnel

During the period from July 1, 1897, through August 31, 1898, the persons making the weather observations and supervising this work are unknown (Appendix B). Beginning on September 1, 1898, Dr. J. G. Mosier became the observer and supervisor, and he continued in the capacity of observer for five years and as supervisor for 22 years, terminating this work in 1920. Professor Mosier's great interest in the weather station and climatology and his recognition of the importance of national weather records are reflected in the cooperative relationship between the campus station and the Weather Bureau during his tenure as supervisor. He also published two of the first noteworthy climatological reports pertaining to Illinois and the weather station.<sup>1,2</sup> His alignment of the campus station with the Weather Bureau station network in 1902 undoubtedly made the future operation of the campus weather station more stable.

In the 1904-1911 period three different student observers served under Mosier, but beginning on April 1, 1911, Mr. W. A. McIntyre was hired as the "weather clerk" (see Appendix B). He became the first person hired solely to perform all the many duties of observing the various weather conditions and of recording these data. These duties had become more extensive in 1902 as a result of the station's affiliation with the Weather Bureau.

Dr. R. S. Smith assumed supervisory control over the weather station on September 1, 1920, when Mosier retired, and continued in this capacity past the end of the second era. Mr. McIntyre retired as the observer on July 31, 1929, and was replaced by Mr. O. J. Ellis who served as observer for one year. On August 1, 1930, Mr. H. P. Etler began as observer, and his service continued into the third era.

### **THIRD ERA: 1931-1948**

This era, which began on July 31, 1931, and closed April 30, 1948, was marked by a declining interest in the campus station among those responsible for its operation. The Agronomy Department had an interest in local weather data, but this largely concerned weather conditions at the Agronomy South Farm experimental area. Thus, a second University-supported weather station, which for a period of years was more completely instrumented than the campus station, was installed on the South Farm during the summer of 1931. Complete operation of this station began in October 1932; but, by the end of 1947 the Agronomy Department's interest in this station, as well as the campus station, had diminished.

#### **Site**

The site of the campus weather station remained the same throughout this era. The South Farm weather station was located 1.3 miles south-southwest of the campus station; a view of the site at the South Farm showing the open exposure is presented in figure 8.

#### **Data Collection**

Data collection at the campus weather station continued with few changes from the previous era. The collection of all soil temperature data at the campus station ended in 1924. The measurements of air and dew point temperatures, relative humid-

ity, sky conditions, wind, and pressure were continued three times each day, at 7 AM, 2 PM, and 7 PM. Adequate measurements of the daily depth of snow on the ground at 7 PM were begun in 1932,<sup>7</sup> and these data were recorded in the Weather Bureau 1009 records. Records of the daily maximum and minimum temperatures, precipitation, snowfall, and weather conditions were made for 24-hour periods ending at 7 PM. However, in the 1931-1935 period daily precipitation amounts during the April-September season continued to be measured at 7 AM rather than at 7 PM. After 1935 and until 1956 all daily values of precipitation and temperature were based upon measurements made at 7 PM.

Automatic recording of weather data for the campus station during this period was largely a continuation of the types collected during the previous era. The continuous records of air temperature in the shelter persisted. The hygrothermograph continuous record of air temperature and relative humidity was made from June 22, 1931, through November 3, 1941. The Triple Register continued automatic records of sunshine, rainfall, and wind conditions until December 4, 1947. Continuous records of pressure were resumed on March 7, 1939, and were made on a continuing basis into the next era.

Data collection at the South Farm weather station was more extensive than at the campus station during most of this era. Daily records of maximum and minimum temperatures, precipitation, and snowfall were made from October 1, 1932, through March 31, 1948, from measurements at 9 AM. Daily records of soil temperatures at 9 AM for depths of 36 and 72 inches were made from October 1932 through March 1948, and for depths of 24 and 48 inches from April 1936 through March 1948. At depths of 3, 8, and 12 inches the maximum and minimum daily soil temperatures were measured from August 1932 through May 1934. Thereafter, measurements at the 8- and 12-inch depths were obtained by recording soil thermographs, which continued until 1958. On July 15, 1935, automatically recorded soil temperature data for a 4-inch depth was begun, which also continued until 1958. Also, a recording soil thermograph for a 2-inch depth was installed on January 1, 1936, and records were made until 1957. Thus, quite extensive soil temperature records for certain times of the day (manual observations) and for continuous periods of time (automatic observations) were made at the South Farm station.<sup>7</sup>

Daily readings at 9 AM were made of the solar radiation maximum temperatures from October 1, 1932, through May 17, 1939. Daily readings of the terrestrial radiation minimum tempera-

tures were made from October 1, 1932, through December 21, 1937.

Many types of automatically recorded weather data were obtained at the South Farm weather station. Continuous wind direction and speed data were collected from July 1932 through April 1948; continuous temperature data from November 3, 1933, until May 19, 1959; and continuous pressure data from June 22, 1932, through May 2, 1948. In addition to the daily nonrecording raingage measurements from 1932 through March 1948, a continuous automatic record of precipitation was made from June 23, 1932, to October 31, 1957.

### **Instruments**

Few changes or additions were made to the weather instruments at the campus station during this third era. A new hygrothermograph was installed in the shelter on June 22, 1931, and used until November 3, 1941. A recording barograph, which was located in Davenport Hall, was put into operation on March 7, 1939, continuing into 1954. Because of mechanical faults operation of the Triple Register ended in 1948.

Complete installation of the South Farm weather station extended through the 1931-1936 period although most equipment was installed by October 1, 1932 (fig. 8). Exact dates of installation and removal of the various instruments are given in the prior section. The shelter put in use at the South Farm was locally constructed and identical with the one in use at the campus station.

### **Personnel**

Throughout this era Mr. H. P. Etler served as the campus station observer, and he assumed the duties of observer for the South Farm station from the time records began there in 1931 until the end of the third era. He also became the supervisor of station operations in lieu of Dr. Smith on December 1, 1936. The end of this third era coincides with Mr. Etler's retirement.

#### FOURTH ERA: 1948 TO PRESENT

The Illinois State Water Survey, in connection with its meteorological research related to the water resources of Illinois, has maintained and supervised the operation of the campus weather station since May 1, 1948, the beginning of the fourth era. Also since 1948 the campus station has been called the Morrow Plots station. A considerable number of additional weather recording instruments have been installed in this era.

By 1959 all measurements of weather conditions at the South Farm station were terminated because of lack of University interest and need for weather data from that location. The Water Survey opened another climatological weather station in 1952 at the University of Illinois Airport, and installed a dense raingage network in the local urban area in the 1948-1951 period.<sup>7,19</sup> Both of these operations continue at present.

During portions of this and the previous era several other weather instruments have been operated in the campus area by various University personnel. No attempt is made here to catalog or describe these because, in general, they were operated only briefly for specific field projects or for instructional purposes.

#### Site

The Morrow Plots station was moved on May 1, 1948, to a new site 120 feet east of the location the shelter had occupied since 1904 (fig. 21). The shelter used since 1888 was abandoned, and a new one of the standard Cotton Region type with a 4-foot high wooden base prescribed by the U. S. Weather Bureau was installed. The raingage also was moved, to a location east of the new shelter. The sites of the two shelters and the present site of the raingages are shown in figure 9. The old shelter and steel base were removed in the spring of 1951.

At the South Farm station site, the shelter shown in figure 8 was replaced in May 1951 with a Cotton Region type, which was placed approximately 40 feet west of the old shelter location. The Friez-type recording raingage was installed near the site of the nonrecording raingage (fig. 8).



In 1952 the Water Survey installed the new station at the University of Illinois Airport on a site 100 feet northeast of the Survey's Meteorological Laboratory, which is approximately 5 miles southwest of the Morrow Plots station. Since a minor move in 1956 this station has been located 40 feet northeast of its original position.

In the 1948-1951 period nine additional recording raingages, which were the property of the Civil Engineering Department of the University of Illinois, were installed throughout the Champaign-Urbana area, and have been maintained and operated by the Water Survey. The exact gage locations are described in other reports.<sup>6,17,20</sup> Since 1958, six additional nonrecording raingages have been installed at residences of Water Survey employees within the local urban area.

### Data Collection and Instruments

The collection of daily maximum and minimum temperatures, precipitation, snowfall, snow-depth, and weather conditions at the Morrow Plots station has continued throughout the fourth era. These measurements were made for the 24-hour period ending at 7 PM until January 1, 1956, when the 24-hour-period observation time was changed to midnight, CST. All these data have been recorded in the station record books and in the Weather Bureau 1009 records. The daily observations of air temperature, dew point, relative humidity, wind speed and direction, sky cover, and pressure, taken at 7 AM and 7 PM, have been continued through this era also; however, the 2 PM observations were discontinued on January 1, 1956. All of these data have been listed in the station records.

Continuous automatic records of rainfall at the Morrow Plots station were made with a Friez recording raingage (fig. 9) from December 15, 1949, until the present. These records supplanted those obtained from the tipping bucket raingage located on the roof of Davenport Hall during the second and third eras. Recording raingage data collected at the nine urban sites from November 1948 to the present are described in other reports.<sup>7,19,21</sup>

On April 23, 1962, a standard 4-foot-diameter evaporation pan was installed 6 feet northwest of the Morrow Plots instrument shelter. Observations of evaporation and wind movement

from an attached cup anemometer were made at 7 AM each day from April 23 to October 31, 1962. This instrument is to be operated in the March-October period in future years.

Continuous records of wind speed and direction have been made with an aerovane instrument since March 1, 1951. This instrument is located on the roof of the Water Resources building which is 0.5 mile northwest of the Morrow Plots station.<sup>7</sup> Continuous barograph records of pressure were obtained until February 4, 1954, and microbarograph pressure records have been collected from July 27, 1950, to the present. These pressure records were made in Davenport Hall from May 1, 1948, until March 1, 1951, when the instruments were moved to the Weather Annex, located 30 feet west of the Water Resources building and 0.4 mile northwest of Davenport Hall.

Continuous temperature records from the weather shelter were obtained throughout this era, and continuous records of relative humidity in the shelter have been made with a hygrothermograph since April 18, 1949.

Palmer dial-type soil thermometers of the Weather Bureau were installed at the Morrow Plots weather station at depths of 4 and 8 inches on December 2, 1959, and daily maximum and minimum temperature data for these depths have been observed and recorded on a continuous basis since that date.

In 1955 the daily weather data from the Weather Bureau 1009 forms for the Morrow Plots station for 1902-1955 were entered into IBM cards.<sup>20</sup> These cards have made it possible to perform a number of climatological studies using machine analysis techniques.

At the South Farm station, data collection terminated during this era. All daily manual observations of the weather had ended, and this equipment had been removed, near the end of the third era; but automatic recording instruments were used to collect data for several more years. Continuous soil temperature records for depths of 1, 2, 4, 8, and 12 inches were made from the start of this era in 1948 until December 1957 using soil thermographs. Thermograph air temperature records were continued from the end of the third era until May 19, 1959, when all data collection at this station terminated. Rainfall data recorded with a Friez raingage installed at this station in 1950 terminated on October 31, 1957. Recorded rainfall data also had been collected from June 23, 1932, to 1950 with a Fergusson-type raingage. Automatic records of relative humidity were made from May 5, 1953, until May 19, 1959, with a hygrothermograph.

Data collection at the Airport climatological station has consisted of daily readings of maximum and minimum temperatures, precipitation, and snowfall, as measured from 7 AM to 7 AM. In addition, continuous records of air temperature and relative humidity have been made at both the Airport and Morrow Plots stations. Continuous records of wind and precipitation also have been made at the Airport station since June 1, 1952.

When the State Water Survey assumed the supervision of the campus and the South Farm weather stations in May 1948, many of the instruments were greatly in need of repair. All instruments in use on May 1, 1948, were the property of the University except a mercurial barometer belonging to the Weather Bureau. Much of this instrumentation had been in use for more than 50 years.

Immediate repairs were made and many of the instruments were replaced. A new 8-inch nonrecording raingage was procured from the Weather Bureau in September 1948. The Weather Bureau also supplied new maximum and minimum thermometers in May 1948, as well as a new Cotton Region type shelter on June 10, 1948, and replaced the old mercurial barometer with a new one on June 18, 1948. The Water Survey installed a new Friez recording raingage at the Morrow Plots station in December 1949. All the other recording equipment including the soil and air thermographs, hygrothermograph, and the barograph were repaired. Use of the Triple Register was discontinued in 1948.

### Personnel

A complete listing of the observers and their supervisors during the fourth era, all employees of the State Water Survey, is presented in Appendix B. Most of the observers were part-time employees who also were students attending the University.

### **SUMMARY**

The compilation of the history of the campus, or Morrow Plots, weather station located at the University of Illinois has revealed a great amount of effort and interest among many University and Water Survey staff members over the past 75

years. The station is the twelfth oldest in Illinois with continuous weather data.

The station has occupied four sites all within a small area of the campus. Three of these sites have been within a 30- by 120-foot area which is surrounded by an environment relatively unchanged since the station's installation there in 1897. The greatest single movement of the station occurred in 1897 when the station was moved 700 feet from its original site. The exposure of all the sites was excellent.

Instrumentation used since the station began in August 1888 has all been of a type and quality equivalent to that presently accepted as accurate and standard in the United States. One of the unique features of the station is the early installation of several types of automatic recording instruments.

Many persons have been involved in the operation, supervision, and maintenance of the campus station. Of those making the more outstanding contributions to the station's continuance and operative quality, it appears that Professor J. G. Mosier was the single most important contributor. Under his supervision the station became recognized as a permanent installation on the local scene, became affiliated in 1902 with the U. S. Weather Bureau, and was the source of data for his use in the preparation of the first quality publications to deal with the weather and climate of Illinois.

The amount, type, and continuous nature of the climatic data collected at this station is unique in the state of Illinois. The only other locations in Illinois with comparable long records of the wind, sky conditions, pressure, relative humidity, dew point temperature, hourly rainfall, hourly sunshine, and hourly temperatures are Chicago, Peoria, and Springfield. However, these three stations have had one or more significant changes in site.

Thus, no other state-located station has undergone so little change in site along with the simultaneous uninterrupted recording of so many weather elements as has the Morrow Plots station. The length and quality of the extensive soil temperature records are unequalled in the Middle West, and the 1888-1890 project in measuring evapotranspiration is one of the earliest such projects in the United States.

## REFERENCES

- 1 Mitchell, J. M. 1961. The measurement of secular temperature change in the Eastern United States. U. S. Weather Bureau Research Paper 43.
- 2 Mosier, J. G. 1903. Climate of Illinois. Univ. of Illinois, Agr. Expt. Sta. Bull. 86, June.
- 3 Mosier, J. G. 1918. Climate of Illinois. Univ. of Illinois, Agr. Expt. Sta. Bull. 208, April.
- 4 Page, J. L. 1949. Climate of Illinois. Univ. of Illinois, Agr. Expt. Sta. Bull. 532, April.
- 5 Huff, F. A. 1949. Rainfall intensity-frequency data for Champaign-Urbana, Illinois. Illinois State Water Survey Circ. 28.
- 6 Changnon, S. A. 1955. Local climatological data, Urbana, Illinois, 1901-1954. Illinois State Water Survey misc. publ. 4.
- 7 Changnon, S. A. 1959. Summary of weather conditions in Champaign-Urbana, Illinois. Illinois State Water Survey Bull. 47.
- 8 Annual reports of Board of Trustees, 1888-1898. Univ. of Illinois, Urbana.
- 9 University of Illinois, College of Agriculture. Official correspondence file for 1888-1902.
- 10 University of Illinois, Agricultural Experiment Station. 1888. Experiment number 76; on operation of campus weather station. Original file copy at Illinois State Water Survey.
- 11 Tilton, L. D., and T. E. O'Donnell. 1930. History of the growth and development of the campus of the University of Illinois. Univ. of Illinois Press, Urbana, 19 p.
- 12 University of Illinois, Agricultural Experiment Station. 1888-1896. Experiment number 73; on collection of soil temperature data. Original file copy at Illinois State Water Survey.

- 13 University of Illinois, Agricultural Experiment Station. 1888-1890. Experiment number 75; on study of evaporation and evapotranspiration. Original copy at Illinois State Water Survey.
- 14 Livingston, Grace J. 1908-1909. An annotated bibliography of evaporation. U. S. Weather Bur. Monthly Weather Rev. (June, September, November 1908; April, May, June, 1909)
- 15 Catalogue of University of Illinois for 1894-1895. 1895. Univ. of Illinois, Urbana.
- 16 Photographic plate number 358. 1898. University of Illinois Archives photographic file.
- 17 DeTurk, E. E., F. C. Bauer, and L. H. Smith. 1927. Lessons from the Morrow Plots. Univ. of Illinois, Agr. Expt. Sta. Bull. 300, December.
- 18 Whitnah, Donald R. 1961. A history of the United States Weather Bureau. Univ. of Illinois Press, Urbana, 126 p. (The author Whitnah also served as an observer for the Morrow Plots station.)
- 19 Changnon, S. A. 1962. A climatological evaluation of precipitation patterns over an urban area. U. S. Public Health Service Sanitary Engineering Center Technical Report A62-5.
- 20 Changnon, S. A. 1955. First progress report, Illinois cooperative project in climatology. Illinois State Water Survey Circ. 51.
- 21 Huff, F. A., and S. A. Changnon. 1960. Distribution of excessive rainfall amounts over an urban area. Jour. of Geophys. Research v.65(11):3759-3765, November.

## APPENDIX A

### CHRONOLOGY OF EQUIPMENT AND SUPPLY PURCHASES FOR CAMPUS WEATHER STATION, 1888-1900

(These records were found primarily in the official correspondence and records of the College of Agriculture, which are bound in annual volumes beginning with May 1888; and in the annual reports of the University of Illinois Board of Trustees. By 1901 most of the equipment which was used until 1948 had been purchased, and no attempt has been made to itemize the few purchases made after 1900.)

1. June 19, 1888, an order was placed to the Henry J. Green Co., New York, for dry and wet bulb thermometers; two sets No.-112 maximum and minimum thermometers; maximum solar radiation thermometers and enclosing tubes; minimum terrestrial radiation thermometers, type-115, with enclosing tube; two type-332 standard raingages and glass graduates; soil thermometers for depths of 1, 3, 6, 9, 12, 24, and 36 inches; and a barometer. These were billed as of June 25, 1888, and were received locally before July 11. The total bill came to \$190.35.
2. July 11, 1888, a letter to Brig, General Greeley of the U. S. Signal Service, Washington, D. C., was mailed by Mr. W. L. Pillsbury. This letter requested sample blanks of weather logs so that the College could copy them for record keeping, and stated that all "usual instruments for taking meteorological observations are procured except for an anemometer." (1888 v. 1, p. 56)
3. In the latter part of July an order was placed to the Pantagraph Co., Bloomington, Illinois, for a record book.
4. August 17, 1888, the weather records were begun, and since wind data do appear in this record book, an anemometer must have been procured after the July 11 letter to Gen. Greeley and before August 17. No record of its purchase was found.
5. \$190.35 bill was paid to the Green Co. August 28, 1888.
6. October 8, 1888, Mr. Pillsbury sent another letter to the Green Co. for "one maximum thermometer such as that sent in a set of maximum and minimum thermometers bought of you with other instruments on June 27, 1888." (1888 v.1,p.143)

7. The Green Co. bill for this thermometer order was dated October 12, and the warrant to pay the bill was made out on October 29, 1888, for a cost of \$5.00.
8. Volume 2 of the College correspondence files shows that a warrant dated September 4, 1889, for \$38.30 was paid to the H. J. Green Co. for an "aneroid and thermometer."
9. December 31, 1889, the firm of Rendall and Kitteridge was paid \$1.50 for Hazen's Meteorological Tables.
10. February 26, 1890, a new 6-inch soil thermometer with outer glass covering was ordered; \$6.55 was paid March 31.
11. September 26, 1890, the scale on the maximum thermometer (evidently not etched in glass as at present) was broken, and a new one was ordered (Catalogue No. 2961) along with a bottle of "blacking to color the graduations on the tube." Unfortunately, they received a complete new thermometer on October 14 and not the scale. On December 23, 1890, the maximum was sent back to the Green Co. to have a new scale attached. The \$5.50 bill for new scale and thermometer (by mistake) was paid February 27, 1891.
12. November 19, 1891, a new 12-inch soil thermometer type-384 was ordered "as the old one was broken," and this was paid for on December 26, 1891, with a warrant of \$7.25.
13. March 15, 1892, a new minimum thermometer was ordered "like that one you sent us in June 1888." This cost \$4.20, which was paid April 27, 1892.
14. A new minimum terrestrial radiation thermometer with enclosing tube was ordered on November 22, 1892, to replace a broken one. However, the stand was in good condition. This \$5.20 bill was paid December 30, 1892.
15. A new maximum thermometer and two new minimums were ordered on January 16, 1893, but the Green Co. sent the wrong types (terrestrial and solar radiation types). The College wanted the type-112 thermometers, as they complained in their letter to the Green Co. on February 28, 1893. Bill for \$11.50 was paid March 13, 1893.
16. July 15, 1893, another type-332 raingage was ordered, "same as the one sent us in June 1888." This cost of \$7.25 was paid in two installments in 1893.
17. August 30, 1893, a 3-foot soil thermometer was ordered



"same as the one you furnished us in 1888." This was paid for by a warrant for \$8.85 on October 3, 1893.

18. January 6, 1894, two new dry bulb thermometers were ordered. These were paid for on February 22 at \$7.67.
19. Starting with 1894, the less frequent orders suggest that personnel were more familiar with handling the instruments.
20. An order for a 1-inch soil thermometer was placed on September 19, 1895, and the \$9.35 cost was paid October 26.
21. April 11, 1896, a letter was written to the Green Co. asking for a catalogue and specifically for a quote on prices of "raingauges and the cylinders which go with them."
22. July 15, 1897, a bill of \$2.95 was paid to the University of Illinois for material for a barometer case.
23. By November 15, 1897, a letter to the Green Co. said, "We have three type-332 standard raingauges, but our glass graduate tubes for measuring cubic inches of rainfall have been destroyed. Please send us three of these graduate tubes, graduated to cubic inches, tenths, and hundreds." This cost \$13.10.
24. October 13, 1898, a minimum thermometer was obtained, for which \$6.00 was paid on December 30, 1898.
25. October 24, 1899, a maximum thermometer "Weather Bureau pattern with aluminum back" was ordered. Evidently, this represents a new style developed in maximum thermometers. It was paid for November 20 by a \$4.05 warrant.
26. January 3, 1900, an order was made to H. J. Cox of the Weather Bureau in Chicago for a new set of weather flags, types 1, 2, 3, and 4. (Such weather flags were flown from the east tower of University Hall to indicate the forecasted state of the weather to the community.)
27. February 17, 1900, a new glass graduate was ordered for raingage type-332, and \$2.00 was paid on March 20.
28. May 12, 1900, Prof. Davenport wrote to the Weather Bureau in Washington requesting information on the dealers of the "best self-recording meteorological instruments," and on May 21, he wrote three identical letters to the H. J. Green Co., J. P. Friez. and Schneider Bros. requesting catalogues for recording instruments.

**APPENDIX B**

**CHRONOLOGY OF PERSONNEL AT CAMPUS STATION  
IN CHAMPAIGN-URBANA**

<u>Term of Service</u>	<u>Actual Observer</u>	<u>Supervisor</u>
8/16/88 to 4/30/94	unknown	W. L. Pillsbury
5/1/94 to 9/30/96	unknown	unknown
10/1/96 to 6/30/97	Mair	unknown
(Station moved to rear of observatory in June 1897)		
7/1/97 to 4/30/98	unknown	unknown
5/1/98 to 8/31/98	unknown	unknown
9/1/98 to 9/30/03	J. G. Mosier	J. G. Mosier
10/1/03 to 10/31/04	Wesley Gossett	J. G. Mosier
(Station moved 70 feet west in April 1904)		
11/1/04 to 9/30/07	George Hay	J. G. Mosier
10/1/07 to 3/31/11	R. H. Stewart	J. G. Mosier
4/1/11 to 8/31/20	W. A. McIntyre	J. G. Mosier
9/1/20 to 7/31/29	W. A. McIntyre	R. S. Smith
8/1/29 to 7/31/30	O. J. Ellis	R. S. Smith
8/1/30 to 11/1/36	H. P. Etler	R. S. Smith
12/1/36 to 4/30/48	H. P. Etler	H. P. Etler
(State Water Survey assumed control May 1, 1948; station moved 120 feet east)		
5/1/48 to 9/30/49	R. D. Gilroy	F. A. Huff
10/1/49 to 5/31/51	G. F. Beatty	F. A. Huff
6/30/51 to 8/21/51	G. F. Beatty	G. E. Stout
8/22/51 to 12/31/54	D. R. Whitnah	G. E. Stout
1/1/55 to 8/3/56	D. R. Whitnah	S. A. Changnon
8/4/56 to 1/10/57	J. W. Bryner	S. A. Changnon
1/11/57 to 2/10/57	S. A. Changnon	S. A. Changnon
2/11/57 to 6/4/57	J. C. Primm	S. A. Changnon
6/5/57 to 9/18/58	A. H. Krueger	S. A. Changnon
9/19/58 to 2/14/60	J. E. Taylor	S. A. Changnon
2/15/60 to present	G. R. Boyd	S. A. Changnon

**APPENDIX C**

**SUMMARY OF CLIMATOLOGICAL DATA, URBANA**

(Reproductions of the computer printouts of temperature and precipitation data from the records of the Urbana weather station are presented on the next five pages.)

URBANA

AVERAGE TEMPERATURE

YEAR	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEP.	OCT.	NOV.	DEC.	ANNUAL
1889	28.6	23.5	40.0	50.8	58.3	65.0	72.0	68.8	62.2	47.7	36.9	42.2	49.7
1890	33.4	35.1	32.9	51.9	58.1	74.1	72.5	68.1	60.3	52.3	42.4	31.0	51.0
1891	31.5	32.3	32.6	52.3	57.5	71.7	69.5	71.2	69.3	51.8	35.9	36.6	51.0
1892	18.2	33.5	37.7	47.7	57.6	71.4	73.3	72.0	65.0	53.7	34.9	27.0	49.3
1893	14.7	26.9	38.5	49.7	58.1	71.3	77.4	72.0	67.0	53.8	39.0	29.2	49.9
1894	30.0	24.8	44.2	51.9	59.6	73.0	73.9	73.1	66.6	53.3	36.0	34.0	51.7
1895	19.4	17.9	37.5	52.7	62.4	73.3	71.1	74.0	68.7	46.5	37.8	31.3	49.4
1896	27.9	29.7	33.9	57.4	68.2	71.1	74.0	73.1	62.8	50.0	40.4	34.1	51.9
1897	22.3	30.5	40.1	49.4	57.1	69.2	75.9	70.5	70.3	59.3	40.6	26.9	51.0
1898	31.5	29.9	43.1	48.6	60.3	72.4	75.2	73.0	60.9	52.1	37.1	26.9	51.6
1899	25.9	18.4	32.0	53.0	63.0	73.0	74.2	75.4	64.2	50.3	43.6	27.4	50.8
1900	30.5	22.9	33.4	51.0	63.4	69.8	74.7	78.5	60.6	61.0	40.5	30.8	52.2
1901	20.5	21.0	38.5	49.1	59.8	73.1	80.2	74.5	66.5	55.1	36.5	24.2	50.6
1902	25.5	17.2	41.6	40.2	65.7	68.5	75.0	70.2	62.6	56.3	47.2	26.8	50.4
1903	23.9	25.7	44.3	50.8	64.0	65.5	74.9	71.6	65.6	54.2	36.2	22.2	49.9
1904	17.9	21.7	38.5	45.2	61.2	68.0	72.6	70.3	66.1	53.1	42.2	27.7	48.8
1905	19.2	16.8	44.1	50.6	62.6	71.1	72.9	74.7	67.4	52.3	39.5	29.8	50.1
1906	32.3	27.4	29.1	54.1	62.2	60.9	75.2	75.3	69.1	53.1	40.2	32.6	51.5
1907	31.0	20.9	46.6	42.5	55.4	66.7	70.2	70.8	65.0	51.4	38.2	32.1	50.2
1908	28.8	26.8	43.0	50.3	61.9	69.3	73.9	72.8	69.1	54.1	42.5	32.0	52.0
1909	28.4	32.9	38.1	49.3	58.8	70.2	71.1	75.5	63.4	49.1	49.8	20.1	50.6
1910	27.0	25.3	50.3	52.0	57.0	69.6	74.8	71.1	65.9	57.0	36.6	25.7	51.0
1911	29.5	33.7	39.7	48.5	67.4	74.4	76.3	73.1	67.8	53.4	35.1	33.4	52.7
1912	13.9	21.5	30.4	52.1	63.9	67.5	74.2	71.4	67.7	56.3	42.0	33.1	49.5
1913	30.9	24.4	37.1	51.3	62.9	73.8	78.2	77.5	66.4	52.9	47.5	36.4	53.3
1914	33.7	20.5	37.2	51.1	63.6	74.3	78.0	75.0	65.0	57.4	44.1	22.2	51.0
1915	23.3	36.2	35.2	56.3	58.4	67.6	72.0	67.1	67.8	55.3	44.4	20.9	51.0
1916	29.8	26.4	36.0	48.9	61.7	65.8	80.0	76.5	64.3	54.4	43.7	27.5	51.3
1917	28.7	23.6	41.4	47.9	55.3	67.2	73.2	70.6	63.1	45.7	42.8	21.4	48.4
1918	11.6	30.1	46.7	46.4	64.7	70.1	71.6	77.0	58.6	57.0	42.0	38.1	51.2
1919	31.2	31.4	41.9	51.7	59.3	73.8	77.5	71.7	69.0	57.9	39.5	23.8	52.4
1920	20.1	28.9	40.6	44.8	59.9	71.3	73.3	71.1	68.3	59.6	40.0	31.1	50.8
1921	33.2	35.4	48.9	53.9	64.1	75.5	79.9	72.0	69.9	54.6	42.2	33.5	55.3
1922	24.0	31.8	42.3	52.5	65.3	72.9	74.0	73.9	69.5	57.8	43.1	30.9	53.2
1923	32.2	24.4	36.3	49.5	59.9	71.9	75.7	72.0	65.3	51.0	42.7	39.9	51.7
1924	20.1	29.1	35.4	52.8	55.4	68.4	71.7	73.1	61.1	59.7	42.0	24.1	49.4
1925	24.5	35.3	42.2	57.3	58.9	74.3	75.4	73.4	72.2	45.2	38.6	27.0	52.0
1926	27.5	33.4	33.2	44.7	64.2	67.2	75.9	75.3	66.5	53.4	37.2	27.7	50.5
1927	25.2	37.9	43.4	51.7	60.1	66.5	73.4	67.4	70.0	58.8	45.0	28.2	52.3
1928	27.5	32.2	39.6	46.9	61.8	65.4	74.9	74.1	61.8	57.3	42.4	33.4	51.4
1929	21.4	23.5	46.5	54.1	58.6	68.6	75.0	70.7	64.9	53.1	36.6	28.7	50.1
1930	20.8	39.3	38.6	54.6	63.4	70.7	78.2	76.0	68.9	52.9	42.2	31.0	53.1
1931	32.4	37.3	35.9	52.6	58.9	73.9	78.3	74.5	72.1	59.0	50.2	39.2	55.4
1932	35.8	37.7	33.0	52.5	63.3	72.9	76.7	74.2	65.6	54.3	35.6	29.4	52.6
1933	37.7	20.9	39.9	51.6	63.5	77.9	70.3	73.0	72.2	53.1	40.4	34.2	54.2
1934	32.9	24.6	35.2	51.9	67.5	78.5	80.7	73.9	64.5	57.9	45.9	27.7	53.4
1935	29.1	33.1	46.6	48.8	56.3	67.7	77.7	74.5	66.3	55.2	40.4	24.9	51.7
1936	19.9	19.0	43.0	47.7	65.4	71.9	83.1	79.0	70.0	54.7	38.5	34.1	52.2
1937	28.4	28.5	37.4	50.4	62.8	70.4	74.3	76.5	65.5	52.0	38.0	27.9	51.0
1938	27.6	37.7	47.7	53.3	61.6	69.9	76.0	75.7	68.7	59.9	43.9	31.3	54.4
1939	33.4	30.3	42.0	47.7	65.5	73.0	75.5	72.7	71.6	56.0	41.5	34.6	53.7
1940	14.3	30.5	31.0	49.4	58.5	72.6	76.0	74.8	66.1	60.0	39.6	35.6	51.2
1941	29.9	27.3	36.1	56.4	66.0	72.8	75.1	74.4	69.4	58.6	43.7	37.4	53.9
1942	27.0	27.4	43.2	55.6	62.5	71.6	76.3	72.6	65.1	55.8	44.3	25.1	52.3
1943	28.1	33.3	36.6	49.8	60.9	74.8	77.4	75.9	63.0	55.4	38.3	28.2	51.8
1944	33.3	32.2	36.4	49.8	67.2	76.1	75.6	74.1	66.9	55.5	43.8	24.2	52.9
1945	22.9	32.7	49.8	52.3	57.4	67.9	73.3	73.0	64.9	53.1	41.7	23.3	51.0
1946	28.8	33.3	51.0	54.6	58.8	68.3	74.9	70.1	66.8	60.4	45.4	36.0	54.1
1947	32.0	24.2	34.1	51.4	58.8	68.7	72.6	80.9	67.9	63.4	37.4	33.3	52.1
1948	23.2	29.9	40.0	55.8	61.1	12.8	75.2	74.0	68.5	52.7	44.6	33.9	52.6
1949	30.5	32.3	40.0	51.1	65.6	74.8	78.0	74.4	62.5	58.9	43.6	36.3	54.1
1950	34.4	30.2	36.5	46.0	64.7	70.9	73.0	70.0	65.5	60.3	36.0	21.3	50.7
1951	28.9	30.4	37.9	40.3	64.3	68.7	74.0	71.9	62.9	57.1	34.6	29.2	50.7
1952	30.4	35.7	38.6	53.4	61.8	77.3	77.4	72.5	67.1	50.9	43.5	34.3	53.6
1953	32.8	36.0	42.5	49.1	64.1	77.1	76.2	74.6	68.3	59.7	44.2	33.0	54.0
1954	30.5	40.3	38.1	57.6	59.2	76.6	79.2	74.2	71.6	56.0	43.4	33.3	55.1
1955	28.0	31.7	40.8	58.8	65.1	68.2	80.1	77.2	69.7	56.3	37.9	28.8	53.6
1956	21.4	31.6	40.1	49.5	63.5	73.9	72.8	73.3	65.5	61.7	40.3	35.5	52.9
1957	21.7	35.9	40.4	52.3	62.0	72.4	76.9	74.3	64.7	52.3	40.6	35.4	52.4
1958	27.8	23.1	36.3	52.7	63.3	66.5	72.9	73.6	66.4	56.3	44.2	24.2	50.6
1959	22.4	30.3	40.4	52.3	66.4	74.1	75.9	78.1	68.8	53.6	34.4	36.2	52.7
1960	29.3	27.0	25.9	54.7	59.4	69.5	73.5	74.8	71.6	55.9	42.6	25.0	50.8
1961	24.3	34.6	42.7	46.1	57.5	70.0	74.1	73.9	70.3	56.3	42.0	28.0	51.7
1962	21.0	30.3	36.6	51.4	69.4	72.2	72.9	72.9	63.8	57.7	42.6	26.6	51.5
MEAN	26.9	29.3	39.4	51.1	61.7	71.2	75.3	73.4	66.7	55.1	40.9	30.2	51.8

URBANA

MAXIMUM TEMPERATURE

YEAR	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEP.	OCT.	NOV.	DEC.	ANNUAL
1889	36.6	33.8	50.2	64.1	70.5	74.4	82.5	81.2	74.0	59.1	44.0	52.8	60.3
1890	43.3	43.7	42.2	63.5	69.2	84.8	85.9	80.5	72.4	61.8	52.1	41.0	61.7
1891	39.9	42.2	41.1	64.4	72.4	83.9	83.7	84.9	85.3	65.7	44.8	45.6	62.8
1892	27.5	40.9	46.9	57.2	66.7	82.3	84.8	84.7	79.4	67.9	43.5	36.0	59.8
1893	24.5	35.5	48.2	59.4	69.0	83.2	91.7	87.5	81.9	67.2	52.1	38.4	61.6
1894	39.7	33.9	55.6	64.3	71.5	87.4	89.6	87.3	78.7	66.2	45.8	42.8	63.6
1095	29.6	27.8	49.3	64.8	76.0	81.8	84.2	88.5	82.0	61.2	46.8	39.2	61.4
1896	35.3	37.9	43.1	69.6	79.9	81.3	85.2	84.4	73.6	62.8	49.8	41.8	62.1
1897	30.0	31.1	49.0	58.4	68.7	79.8	85.7	83.4	86.9	75.1	49.3	34.1	61.5
1898	37.7	38.2	51.6	59.1	70.6	83.0	81.0	83.7	79.2	60.1	45.5	34.5	60.9
1899	34.0	27.0	40.2	64.0	72.5	83.3	85.7	88.9	78.4	71.6	52.5	36.2	61.2
1900	39.7	32.4	42.4	62.7	75.4	80.2	85.7	89.0	80.6	73.5	50.0	39.2	62.6
1901	37.1	30.1	41.2	59.6	71.0	84.4	93.2	87.5	80.2	67.9	45.9	30.6	61.2
1902	33.8	26.9	49.8	59.2	77.3	78.5	85.9	80.4	73.0	67.2	56.0	33.7	60.1
1903	32.0	34.3	54.7	62.6	76.3	76.4	86.0	82.4	79.0	66.0	46.0	32.0	60.6
1904	27.0	30.7	47.3	56.1	72.5	80.2	83.9	82.7	77.5	65.6	54.4	36.9	59.6
1905	28.4	26.5	54.8	61.8	73.1	83.9	82.3	86.1	78.5	64.4	51.0	38.4	60.8
1906	40.9	37.5	36.2	66.7	74.9	19.3	85.6	86.7	80.9	63.3	49.2	39.6	61.7
1907	38.5	37.0	55.6	51.8	66.1	77.0	84.9	80.4	75.3	62.9	48.0	39.0	59.7
1908	37.8	34.0	53.2	60.4	70.9	79.0	84.2	84.2	82.7	66.4	52.4	41.0	62.3
1909	36.2	41.9	46.1	59.2	69.1	80.7	80.7	87.2	74.2	59.9	60.2	28.0	60.3
1910	33.4	34.0	62.9	63.3	66.4	81.2	85.0	82.5	76.3	69.4	46.6	33.6	61.2
1911	37.7	40.9	50.4	57.0	78.9	86.8	88.0	84.6	76.8	62.5	43.2	39.6	62.2
1912	21.2	28.2	37.8	62.1	73.7	78.0	83.2	81.0	70.4	68.8	51.2	42.1	58.9
1913	39.5	33.4	47.3	61.9	74.3	86.1	90.1	89.1	77.1	61.9	55.3	41.7	63.1
1914	40.3	28.9	44.9	59.7	74.4	85.7	88.3	85.8	76.1	67.1	55.0	29.6	61.3
1915	30.9	42.5	42.3	67.6	68.1	77.8	80.7	75.2	77.6	66.9	54.6	34.8	59.9
1916	39.1	34.5	46.7	59.1	71.7	74.4	91.5	88.0	76.7	66.0	53.5	36.0	61.5
1917	37.5	33.0	51.2	57.6	65.3	76.9	83.4	80.7	74.9	55.8	52.2	29.2	58.1
1918	19.7	39.8	59.6	56.4	75.4	81.5	82.5	87.8	69.1	66.9	50.1	45.3	61.2
1919	40.0	39.4	51.8	62.7	69.4	83.9	89.7	82.5	80.6	68.1	48.1	31.4	62.3
1920	27.6	36.0	50.1	53.4	70.1	82.3	84.7	82.0	79.4	71.2	47.8	38.5	60.3
1921	39.4	42.4	60.2	63.8	74.8	85.8	91.6	81.6	79.1	65.3	50.6	40.4	64.6
1922	33.5	40.2	50.6	62.0	74.9	84.2	84.5	85.5	82.1	69.7	50.9	39.6	63.1
1923	38.2	31.9	46.3	60.6	70.7	81.6	86.2	81.9	74.6	60.8	51.0	47.4	60.9
1924	29.5	36.0	41.5	63.9	65.5	78.0	82.4	83.1	71.1	72.2	51.1	32.3	58.9
1925	33.1	43.8	53.5	69.5	72.3	85.2	86.4	84.7	82.1	52.4	47.1	34.1	62.0
1926	34.7	39.6	41.7	54.5	76.1	77.9	87.3	84.3	74.3	62.0	45.0	34.7	59.3
1927	32.8	45.8	51.5	60.6	69.2	76.2	83.7	77.4	80.3	69.9	54.3	36.5	61.5
1928	35.3	39.9	48.9	57.3	73.6	74.2	85.0	84.0	73.2	66.8	49.4	41.0	60.7
1929	31.2	31.9	56.0	63.7	68.2	78.7	04.5	81.3	75.5	63.0	44.3	36.4	59.6
1930	20.9	41.4	48.5	66.1	74.1	83.0	90.8	88.0	79.8	62.6	51.5	37.8	63.2
1931	40.2	44.9	42.5	62.9	69.5	84.6	88.9	85.5	82.6	68.2	58.2	45.5	64.5
1932	42.5	46.1	41.5	63.8	74.4	83.5	87.7	85.0	76.6	64.5	44.1	37.3	62.3
1933	45.8	37.7	47.9	61.5	72.3	90.9	90.0	83.9	82.9	63.2	50.0	42.1	64.0
1934	40.1	33.4	44.5	63.1	80.8	90.7	92.5	83.8	73.3	68.7	54.0	33.9	63.2
1935	36.6	39.6	55.8	57.7	65.0	76.9	87.4	83.8	77.6	65.1	47.1	31.4	60.3
1936	27.3	28.1	52.3	58.4	76.1	85.6	95.9	90.2	79.9	64.5	47.5	41.9	62.3
1931	36.4	36.0	45.9	59.7	73.3	80.1	84.5	86.8	77.1	61.0	47.4	33.1	60.1
1938	34.8	44.4	57.0	63.2	71.8	79.5	85.9	85.6	78.9	72.6	53.6	38.3	63.8
1939	40.4	39.1	51.7	51.5	77.1	81.9	85.5	83.6	85.0	69.0	50.3	43.1	63.7
1940	21.4	35.9	44.7	59.3	68.5	83.1	88.0	85.7	78.8	71.8	48.4	42.4	60.7
1941	36.2	34.5	45.0	66.5	77.1	83.0	85.8	85.6	80.6	67.4	52.2	43.6	63.1
1942	36.3	33.2	52.2	67.0	72.5	81.5	86.4	82.7	75.2	65.9	53.1	32.8	61.6
1943	35.5	43.7	47.0	61.2	70.5	84.5	89.1	86.3	74.6	66.7	46.5	35.6	61.8
1944	42.1	40.6	44.6	59.5	77.2	87.8	88.0	84.7	77.3	67.5	49.9	31.6	62.6
1945	29.8	40.2	61.9	62.0	67.0	71.2	84.8	83.5	76.0	64.2	50.1	30.2	60.6
1946	31.3	42.5	62.3	66.2	67.8	82.5	86.1	81.0	79.4	73.1	54.2	45.0	64.8
1941	39.8	32.1	42.0	61.1	68.9	78.1	83.9	92.1	79.0	74.7	43.9	40.3	61.3
1948	30.9	38.4	48.2	66.8	72.0	84.0	85.7	86.2	80.3	63.0	53.6	42.6	62.7
1949	38.2	40.1	50.4	62.3	77.6	84.9	88.1	84.6	73.9	68.9	52.9	44.6	63.9
1950	43.4	37.4	44.8	54.9	75.9	81.0	83.6	80.3	74.4	71.5	44.3	29.5	60.1
1951	34.7	37.5	46.0	57.3	75.6	77.9	83.5	82.2	73.0	68.4	42.2	37.2	59.6
1952	37.5	42.9	47.4	64.8	71.5	88.3	88.3	83.4	80.7	64.2	53.2	40.4	63.6
1953	39.0	45.4	51.2	58.9	75.1	89.1	87.2	87.5	83.9	73.8	54.4	41.8	65.6
1954	38.5	49.2	46.7	69.0	70.5	87.9	91.9	83.9	84.8	66.5	51.7	39.4	65.0
1955	34.6	39.4	50.9	69.4	76.0	77.9	89.8	88.3	81.9	66.5	47.4	36.8	63.2
1956	35.4	38.8	50.5	60.5	74.1	85.1	82.5	83.7	78.8	75.3	49.5	41.6	63.0
1957	29.2	42.6	49.2	60.4	71.5	82.3	86.7	84.5	75.5	62.3	48.6	42.8	61.3
1958	34.1	31.9	42.6	63.1	74.9	77.3	81.4	84.1	77.1	68.2	53.5	32.9	60.1
1959	30.9	38.6	50.3	62.6	76.5	86.0	07.4	88.4	80.4	63.3	42.8	42.3	62.5
1960	36.1	32.9	33.7	65.5	68.5	79.3	84.2	85.5	82.7	67.3	51.9	32.7	60.0
1961	32.2	43.0	50.7	55.4	68.8	81.3	85.5	84.3	81.8	66.5	49.8	34.9	61.2
1962	28.2	31.8	43.9	62.1	80.0	83.3	82.6	83.8	74.1	67.7	50.7	35.4	60.9
MEAN	34.8	37.4	48.6	61.6	72.4	82.0	86.3	84.5	78.2	66.3	49.9	37.9	61.7

URBANA

MINIMUM TEMPERATURE

YEAR	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEP.	OCT.	NOV.	DEC.	ANNUAL
1889	20.5	13.2	29.8	37.4	46.1	55.5	61.4	56.3	50.3	36.3	29.7	31.5	39.0
1890	23.5	26.5	23.5	40.2	46.9	63.4	59.0	55.7	48.1	42.8	32.6	20.9	40.3
1891	23.1	22.3	24.0	40.1	42.5	59.4	55.3	57.5	53.3	37.8	27.0	27.5	39.2
1892	8.9	26.1	28.5	38.1	48.4	60.5	61.8	59.2	50.6	39.4	26.2	17.9	38.8
1893	4.9	18.3	28.8	40.0	47.2	59.4	63.1	56.5	53.6	40.4	25.9	19.9	38.2
1894	20.3	15.6	32.8	39.5	47.7	58.5	58.1	58.8	54.4	40.3	26.2	25.1	39.8
1895	9.1	8.0	25.7	40.6	48.7	58.7	58.0	59.4	55.3	31.8	28.7	23.4	37.3
1896	20.5	21.5	24.6	45.2	56.5	60.8	62.7	61.7	51.9	37.2	30.9	26.3	41.7
1897	14.6	23.8	31.1	40.3	45.4	58.5	66.0	57.5	53.6	43.4	31.9	19.7	40.5
1898	25.3	21.5	34.5	38.1	49.9	61.7	63.3	62.2	58.5	44.0	28.7	19.2	42.2
1899	17.8	9.7	25.3	41.9	53.4	62.7	62.7	61.9	49.9	44.9	34.6	18.5	40.3
1900	21.3	13.3	24.3	40.9	51.4	59.3	63.7	68.0	56.6	48.5	31.0	22.4	41.7
1901	19.8	11.9	29.8	38.6	48.5	61.7	67.2	61.5	52.7	42.2	27.0	17.7	39.9
1902	17.2	7.4	33.3	37.1	54.0	58.5	64.0	60.0	52.1	45.3	38.3	19.8	40.6
1903	15.7	17.1	33.8	38.9	51.7	54.6	63.7	60.7	52.1	42.3	26.3	12.4	39.1
1904	8.8	12.7	29.6	34.3	49.9	57.4	61.2	57.9	54.7	40.5	29.9	18.5	38.0
1905	10.0	7.0	33.3	39.3	52.1	58.3	63.4	63.3	56.3	40.2	28.0	21.1	39.4
1906	23.7	17.2	21.9	41.5	49.4	58.5	60.7	63.9	57.3	42.9	31.1	25.5	41.1
1907	23.5	20.8	37.5	33.2	44.7	56.4	63.5	61.2	54.6	39.8	27.5	25.2	40.7
1908	19.8	19.6	32.8	40.2	52.8	58.7	63.5	61.4	55.5	41.7	32.5	23.0	41.8
1909	20.6	23.9	29.5	39.3	48.5	59.7	61.4	63.7	52.6	38.2	39.4	12.1	40.7
1910	20.5	16.5	37.7	40.6	47.5	57.9	64.5	59.6	55.4	44.6	26.5	17.7	40.8
1911	21.2	26.5	28.9	40.0	55.8	62.0	64.6	61.5	58.8	44.2	26.9	27.2	43.1
1912	6.5	14.8	23.0	42.1	54.0	56.9	65.2	61.8	56.9	43.7	32.7	23.5	40.1
1913	22.2	15.3	26.8	40.7	51.4	61.5	66.3	65.9	55.6	43.8	39.7	31.0	43.4
1914	27.0	12.0	29.4	42.4	52.7	62.8	69.9	64.1	53.9	47.6	33.2	14.7	42.5
1915	15.7	29.8	28.0	44.9	48.7	57.3	63.2	58.9	57.9	43.6	34.1	23.0	42.1
1916	20.4	18.3	26.8	38.7	51.6	57.1	68.5	64.9	51.8	42.7	33.9	18.2	41.1
1917	19.8	14.2	31.6	38.2	45.3	57.4	62.9	60.4	51.2	35.5	33.4	13.6	38.6
1918	3.5	20.3	33.8	36.3	54.0	58.6	60.7	66.2	48.1	47.1	33.8	30.8	41.1
1919	22.3	23.4	31.9	40.7	49.2	63.6	65.3	60.8	57.4	47.7	30.9	16.2	42.5
1920	12.6	21.7	31.1	36.2	49.7	60.2	61.9	60.2	57.2	47.9	32.1	23.6	41.2
1921	26.9	28.4	37.6	44.0	53.4	65.2	68.1	62.4	60.7	43.9	33.8	26.6	45.9
1922	14.5	23.4	34.0	42.9	55.6	61.6	63.4	62.3	56.8	45.8	35.2	22.2	43.1
1923	26.2	16.8	26.2	38.4	49.0	62.1	65.1	62.0	55.9	41.1	34.3	32.3	42.5
1924	10.7	22.2	29.2	41.6	45.2	58.8	60.9	63.0	51.0	47.1	32.9	15.8	39.9
1925	15.9	26.8	30.8	45.0	45.5	63.4	64.4	62.1	62.3	38.0	30.1	19.9	42.0
1926	20.2	27.1	24.7	34.8	52.3	56.4	b4.5	66.3	58.6	44.8	29.3	20.7	41.6
1927	17.6	29.9	35.2	42.8	51.0	56.7	63.0	57.3	59.7	47.7	35.7	19.9	43.0
1928	19.7	24.5	30.3	36.4	50.0	56.5	64.7	64.1	50.4	47.7	35.3	25.8	42.1
1929	11.6	15.0	36.9	44.5	48.9	58.5	65.4	60.0	54.3	43.2	28.9	21.0	40.7
1930	12.6	31.2	28.6	43.1	52.7	58.4	65.5	63.9	58.0	43.1	32.9	24.2	42.9
1931	24.6	29.6	29.2	42.2	48.3	63.2	67.6	63.5	61.5	49.8	42.2	32.9	46.2
1932	29.1	29.3	24.5	41.2	52.1	62.3	65.7	63.3	54.6	44.0	27.0	21.5	42.9
1933	29.6	20.0	31.9	41.6	54.6	64.8	66.5	62.0	61.5	42.9	30.7	26.3	44.4
1934	25.6	15.7	25.9	40.7	54.1	66.3	68.9	64.0	55.7	47.1	31.8	21.5	43.6
1935	21.5	26.5	37.3	39.9	47.6	58.4	68.0	65.2	54.9	45.3	33.6	18.4	43.1
1936	12.5	9.8	33.7	36.9	54.6	58.2	70.2	67.8	60.1	44.9	29.5	26.2	42.0
1937	20.3	21.0	28.8	41.1	52.2	60.7	64.1	66.2	53.8	43.0	28.5	22.6	41.9
1938	20.4	31.0	38.3	43.4	51.4	60.3	66.1	65.8	58.5	47.2	34.1	24.3	45.1
1939	26.4	21.4	32.2	37.9	53.8	64.1	65.4	61.7	58.2	44.5	32.7	26.1	43.7
1940	7.1	25.1	29.3	39.4	48.5	62.0	64.0	63.9	53.3	48.1	30.7	28.7	41.7
1941	23.5	20.0	27.2	46.2	54.9	62.5	64.4	63.2	58.2	49.8	35.2	31.1	44.7
1942	19.3	21.6	34.2	44.2	52.4	61.7	66.2	62.4	54.9	45.6	35.4	17.3	42.9
1943	20.6	22.9	26.2	38.3	51.2	65.1	65.6	65.4	51.4	44.1	30.0	20.8	41.8
1944	24.4	23.7	28.2	40.0	57.2	64.3	63.1	63.4	56.5	43.4	37.7	1b.7	43.2
1945	16.0	25.1	37.6	42.8	47.7	58.5	61.9	62.4	53.7	41.9	33.3	1b.4	41.4
1946	20.3	24.1	41.3	43.0	49.7	54.1	63.6	59.2	54.3	47.7	36.6	26.9	43.4
1947	24.2	16.2	26.1	41.6	48.7	59.3	61.3	69.6	56.7	52.0	30.8	26.2	42.7
1948	15.4	21.3	31.7	44.8	50.1	61.5	64.7	61.8	56.6	41.6	35.6	25.2	42.5
1949	22.7	24.4	31.2	39.8	53.6	64.1	69.4	64.1	51.1	48.9	34.3	27.9	44.3
1950	25.4	23.0	28.2	37.1	53.5	60.7	62.4	59.6	5b.5	49.1	27.6	13.0	41.3
1951	20.7	23.3	29.7	39.3	52.9	59.5	b4.4	61.6	52.8	45.8	27.0	21.1	41.5
1952	23.2	28.4	29.7	41.9	52.1	66.3	66.4	61.6	53.5	37.5	33.7	28.1	43.5
1953	26.5	26.6	33.8	39.2	53.1	65.1	65.2	61.7	52.6	45.5	33.9	24.1	43.9
1954	22.0	30.9	29.0	45.7	47.5	65.0	66.2	64.1	57.6	46.7	34.5	26.6	44.7
1955	20.6	23.4	30.3	47.6	53.6	57.9	69.8	65.5	57.3	45.6	28.0	20.5	43.3
1956	19.4	24.3	29.6	38.4	52.2	62.2	63.1	62.9	52.2	48.0	31.0	29.3	42.7
1957	14.2	28.6	31.2	43.7	51.8	61.9	66.6	b3.6	53.9	42.2	32.9	28.0	43.2
1958	21.5	14.3	30.1	42.3	51.6	55.7	64.5	63.1	55.7	44.4	34.9	15.4	41.1
1959	13.8	22.0	30.4	42.0	56.3	61.7	64.4	67.8	57.1	43.8	25.9	30.0	42.9
1960	22.4	21.0	18.1	43.8	50.2	59.7	62.8	64.1	60.4	44.4	33.2	17.2	41.4
1961	16.3	26.1	34.7	36.8	46.2	58.7	62.6	63.4	58.8	46.1	34.1	21.0	42.1
1962	13.3	22.7	29.3	40.6	58.8	61.1	63.2	bz.0	52.9	47.6	34.5	17.7	42.0
MEAN	18.9	21.1	30.2	40.6	50.8	60.3	64.2	62.3	55.2	43.9	32.0	22.5	41.8

URBANA

PRECIPITATION

YEAR	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	ANNUAL
1889	1.48	2.00	1.61	0.61	5.52	8.00	5.81	0.60	2.74	1.42	4.20	1.82	35.97
1890	5.26	1.87	2.70	4.11	3.56	3.80	2.83	1.93	1.19	2.35	1.63	0.05	31.28
1891	0.99	2.60	3.55	3.54	0.89	2.08	1.41	2.86	0.41	1.29	3.91	1.53	25.06
1892	0.79	2.64	2.59	6.45	7.86	5.36	2.50	2.43	0.93	0.93	4.95	1.62	39.05
1893	1.05	4.48	3.20	7.68	4.83	1.55	0.59	0.06	3.62	1.14	2.98	1.09	32.27
1894	1.95	1.33	2.41	1.89	3.34	1.78	1.08	2.06	4.21	0.51	1.95	1.36	23.67
1895	1.36	0.52	0.70	2.42	2.20	2.24	3.61	1.81	5.27	0.21	3.07	5.71	29.12
1896	1.12	1.95	1.22	1.89	5.62	2.98	7.87	3.74	5.84	0.42	2.87	0.39	35.91
1897	3.91	1.09	4.10	4.22	1.80	5.16	4.68	0.63	0.31	0.44	4.91	2.67	33.92
1898	4.77	1.43	7.76	2.69	5.65	6.08	1.89	3.61	5.19	4.53	3.01	1.86	40.47
1899	1.97	2.33	1.74	0.50	6.09	2.29	2.65	2.29	1.07	5.10	1.39	2.14	29.56
1900	0.17	3.61	1.79	0.84	4.60	4.11	3.81	6.23	2.23	2.39	3.42	0.98	34.18
1901	1.55	1.41	3.14	0.80	1.93	5.80	2.48	1.68	1.38	4.10	1.31	3.06	28.64
1902	0.62	1.48	1.70	2.11	2.60	11.58	4.02	9.80	4.90	2.10	2.43	2.94	46.28
1903	1.04	2.40	1.43	5.71	3.95	2.56	5.13	2.33	0.99	2.70	2.06	2.18	32.48
1904	3.09	1.86	7.66	3.97	1.60	1.17	2.72	3.55	2.53	0.81	T	0.83	29.79
1905	1.80	2.27	0.75	2.95	4.24	1.30	5.40	2.14	2.88	3.11	1.45	1.31	29.60
1906	1.65	1.11	4.61	2.23	3.31	3.08	2.16	4.57	2.45	1.36	4.59	3.13	34.25
1907	6.09	0.24	3.34	2.34	5.04	5.56	5.41	4.42	0.94	1.51	1.99	3.32	40.20
1908	1.21	4.09	3.20	5.00	7.83	1.99	2.31	2.05	1.95	0.21	1.99	1.44	33.27
1909	2.17	5.80	1.76	7.44	5.58	3.75	7.57	2.37	2.36	2.25	3.45	2.55	47.05
1910	2.23	1.79	0.38	1.57	5.35	2.99	2.76	2.62	4.14	1.34	1.20	1.59	27.96
1911	2.27	1.19	1.85	3.59	2.44	0.82	0.62	3.35	8.90	3.10	2.03	1.35	32.31
1912	1.36	2.28	3.42	5.60	4.16	1.89	3.68	2.06	1.76	2.95	1.77	0.57	31.50
1913	5.38	1.10	5.99	2.19	0.56	1.73	1.52	1.44	2.50	4.03	4.49	0.77	31.70
1914	1.97	2.50	0.89	2.87	1.94	2.40	1.44	2.66	2.11	2.85	0.80	2.25	24.66
1915	1.81	2.33	1.12	1.59	5.11	2.98	7.30	4.90	2.58	0.64	1.02	2.85	34.23
1916	6.02	0.63	1.14	1.28	5.70	3.08	0.47	1.72	2.69	2.26	1.93	1.99	29.71
1917	1.07	0.45	4.43	3.26	4.91	6.45	2.73	3.80	2.01	2.34	0.18	0.60	32.23
1918	1.74	1.86	1.57	6.78	4.70	5.43	2.51	5.15	4.91	2.82	1.73	3.99	43.19
1919	0.21	1.92	4.12	0.75	3.29	6.90	2.04	4.47	2.47	5.59	3.37	0.12	35.25
1920	0.83	0.45	3.40	5.69	3.80	0.94	3.06	3.19	1.79	2.02	1.29	2.81	29.29
1921	1.60	0.49	5.82	5.25	5.26	1.68	2.54	4.26	5.64	2.23	4.91	1.98	41.61
1922	1.23	1.60	8.35	7.64	3.70	1.03	2.51	2.82	0.57	3.17	2.30	1.81	36.73
1923	1.57	1.34	5.25	2.91	5.26	3.20	3.26	4.08	2.99	3.78	1.68	5.01	40.38
1924	1.70	1.93	2.74	3.61	2.69	8.68	0.86	7.65	2.22	1.36	0.83	6.13	40.40
1925	0.73	1.28	4.62	1.85	0.22	2.28	1.12	3.44	5.24	4.60	2.81	1.19	29.38
1926	1.86	2.98	2.75	4.01	1.54	4.40	2.60	5.79	9.76	4.45	2.46	0.93	43.53
1927	1.67	1.22	3.84	6.48	5.01	5.87	6.02	4.79	6.27	4.15	6.77	3.55	55.64
1928	2.18	2.28	1.45	3.16	2.48	4.65	3.59	2.77	3.65	2.34	1.88	2.53	32.96
1929	3.56	0.53	2.92	6.40	7.80	2.71	6.46	4.77	0.94	3.72	1.36	2.96	44.13
1930	4.81	1.77	1.87	4.07	1.53	2.23	0.47	2.02	2.98	1.62	1.49	0.22	25.08
1931	0.47	1.26	2.62	4.43	3.97	4.33	4.26	2.90	5.41	2.28	2.54	2.00	36.47
1932	2.60	1.69	1.83	1.31	1.28	3.57	2.41	2.63	3.63	3.84	2.37	3.93	31.09
1933	1.96	1.40	5.30	3.35	5.84	1.19	0.61	4.40	5.14	3.41	0.67	1.12	34.47
1934	1.42	0.76	3.60	1.03	0.53	5.33	2.09	4.87	6.99	0.87	5.44	2.22	35.15
1935	2.17	1.27	2.69	2.87	6.93	3.64	4.12	2.36	3.94	1.65	1.25	1.32	37.21
1936	1.28	2.81	1.55	3.00	3.94	0.47	1.35	3.54	5.83	3.49	4.16	3.67	35.09
1937	5.97	1.49	0.76	5.38	2.59	5.43	2.43	0.80	5.34	3.92	1.49	2.05	37.65
1938	1.58	2.28	7.20	3.42	4.97	5.67	6.45	4.28	0.88	2.50	1.57	1.97	42.77
1939	3.72	3.72	4.03	5.39	1.19	6.17	1.73	6.38	0.32	2.54	1.13	0.93	38.05
1940	1.43	1.10	2.07	3.96	4.53	5.04	0.95	2.80	0.48	1.93	3.83	2.48	30.60
1941	1.34	0.64	1.46	4.21	3.94	6.19	3.27	3.61	4.91	9.01	3.33	0.96	42.87
1942	1.93	3.84	4.12	3.32	3.57	3.92	4.94	2.58	3.89	2.36	5.40	2.51	42.38
1943	0.62	1.09	3.80	3.47	11.20	2.43	1.42	3.94	2.12	2.00	2.17	1.28	35.54
1944	0.37	3.70	4.65	7.43	7.70	2.61	3.82	3.85	2.82	1.29	1.34	1.15	40.73
1945	0.36	1.49	6.18	4.37	5.09	7.33	3.20	5.09	7.27	2.45	2.62	2.49	41.94
1946	1.55	2.46	3.29	1.45	6.85	5.77	2.74	2.11	1.15	2.65	3.90	1.54	35.46
1947	2.01	0.15	2.23	4.77	4.51	9.38	2.05	2.05	2.16	3.69	1.99	1.91	36.90
1948	1.26	3.62	4.53	1.97	4.18	6.41	6.30	1.99	3.81	1.68	2.46	3.15	41.36
1949	6.21	2.96	2.40	2.26	4.43	4.57	4.93	2.37	1.67	7.73	1.00	5.00	45.53
1950	7.62	3.71	1.77	4.53	1.80	4.32	5.09	1.65	4.36	2.29	3.47	2.18	42.99
1951	2.07	3.91	3.69	3.07	2.49	4.98	3.66	4.71	2.13	2.76	2.41	2.51	38.39
1952	1.94	1.79	3.66	3.82	5.02	5.70	2.09	2.76	1.67	1.34	2.62	1.46	33.87
1953	2.34	1.49	7.13	1.57	1.94	2.92	3.83	0.68	0.59	1.71	0.72	1.17	26.09
1954	1.81	1.56	1.94	4.15	3.05	2.73	2.92	4.69	C.25	4.46	0.53	1.61	29.70
1955	2.82	2.18	2.30	3.25	2.94	3.01	5.47	1.83	3.15	7.42	2.51	0.30	37.18
1956	0.63	2.43	1.07	2.35	2.92	1.89	5.82	3.79	1.25	0.39	2.11	2.65	27.30
1957	1.61	1.84	1.41	7.49	4.08	6.46	5.09	1.53	0.98	3.26	3.00	4.89	41.64
1958	1.53	0.44	1.37	2.36	4.29	7.50	7.17	3.27	2.84	0.42	4.85	0.59	36.63
1959	2.76	2.79	3.53	3.04	6.56	1.09	1.54	2.44	3.36	4.53	2.61	2.33	36.60
1960	1.54	2.82	1.97	3.28	4.14	6.23	2.77	1.32	2.82	2.30	2.05	1.62	32.86
1961	0.51	2.17	4.59	5.71	5.46	6.47	2.80	1.27	3.92	3.47	3.37	2.36	42.10
1962	4.21	2.14	2.74	2.47	5.27	2.23	9.57	2.81	1.59	2.41	1.53	0.41	37.90
MEAN	2.16	1.97	3.12	3.57	4.09	4.06	3.38	3.17	3.06	2.65	2.55	2.07	35.85

URBANA

SNOWFALL

YEAR	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEP.	OCT.	NOV.	DEC.	ANNUAL
1889													
1890													
1891													
1892													
1893													
1894													
1895													
1696													
1897													
1898													
1899													
1900													
1901													
1902													
1903	7.5	12.0	0.5	1.5	0	0	0	0	0	0	1.5	3.5	26.5
1904	18.2	4.0	4.0	T	0	0	0	0	0	0	0	7.5	33.7
1905	6.5	18.5	0	0.4	T	0	0	0	0	0	0	1.0	26.4
1906	1.0	2.0	32.0	0	0	0	0	0	0	T	T	1.0	36.0
1907	5.5	2.5	7.0	T	9	0	0	0	0	0	0.6	6.5	22.1
1908	2.7	11.5	T	0	0	0	0	0	0	0	T	6.5	20.7
1909	8.0	10.0	0	T	T	0	0	0	0	T	0	18.0	36.0
1910	2.0	8.3	0	4.5	T	0	0	0	0	T	T	1.0	15.8
1911	5.0	4.5	T	T	T	0	0	0	0	0	2.5	1.5	13.5
1912	5.0	16.5	12.3	T	T	0	0	0	0	0	T	T	33.8
1913	3.0	8.0	8.0	T	0	0	0	0	0	0.5	T	2.0	21.5
1914	7.4	18.5	2.0	T	0	0	0	0	T	T	T	13.2	41.1
1915	11.7	0.5	3.5	T	0	0	0	0	0	0	1.1	13.3	30.1
1916	1.2	6.4	5.7	T	T	0	0	0	0	1.4	0.3	4.3	19.3
1917	2.5	1.4	0	T	T	0	0	0	0	0.9	0.2	10.3	15.3
1918	12.8	0.5	T	T	0	0	0	T	T	T	T	0.6	13.9
1919	0.4	6.2	4.0	T	0	0	0	0	0	0	T	0.2	10.8
1920	8.1	0.5	3.0	8.0	0	0	0	0	0	T	0.2	6.9	26.7
1921	2.6	T	0	4.0	T	0	0	0	0	0	0.7	1.1	8.4
1922	6.2	0.9	3.4	T	0	0	0	0	0	0	1.3	2.0	13.8
1923	6.2	0.9	3.4	1.8	T	0	0	0	0	0	T	0.5	12.9
1924	8.1	2.9	11.1	T	T	0	0	0	0	0	T	3.8	25.9
1925	8.8	1.0	1.8	T	0	0	0	0	0	2.5	4.2	1.5	19.8
1926	3.9	4.0	7.0	T	0	0	0	0	0	0	1.5	5.1	22.3
1927	13.7	1.0	T	T	0	0	0	0	0	T	2.0	2.5	20.0
1928	1.5	2.6	0.9	T	0	0	0	0	0	0	T	0.5	5.5
1929	5.3	3.7	0.5	T	2.5	0	0	0	0	1.5	0.8	11.2	25.5
1930	5.1	0.8	6.2	T	0	0	0	0	0	0	2.0	0.3	14.4
1931	3.3	0.3	10.7	T	T	0	0	0	0	0	3.7	0.3	18.3
1932	2.3	0.6	3.4	T	0	0	0	0	0	0	11.2	3.4	20.9
1933	0.3	6.2	4.7	T	T	0	0	0	0	T	0.1	0.2	11.5
1934	0.6	7.4	14.2	T	0	0	0	0	0	0	0	10.2	32.4
1935	0.2	0.3	0.3	T	T	0	0	0	0	0	0.1	5.1	6.0
1936	5.7	3.4	2.5	0.7	T	0	0	0	0	T	T	3.6	15.9
1937	5.1	3.9	4.7	T	0	0	0	0	0	T	4.9	0.6	19.2
1938	3.0	2.0	T	T	T	0	0	0	0	0	1.6	0.6	7.2
1939	11.2	5.9	T	0.3	0	0	0	0	0	0	1.2	4.4	23.0
1940	6.2	5.0	0.9	5.2	T	0	0	0	0	0	0.2	1.7	19.2
1941	5.2	4.2	3.8	0	T	0	0	0	0	0	5.5	1.8	20.5
1942	1.8	5.9	5.5	T	0	0	0	0	0	T	5.0	8.6	26.8
1943	3.3	1.7	2.8	1.0	T	0	0	0	0	0	1.1	6.4	16.3
1944	T	14.9	3.6	T	0	0	0	0	0	0	0.7	11.3	30.5
1945	3.6	2.5	1.0	0	T	0	0	0	0	0	0.5	10.1	17.7
1946	6.5	2.2	3.0	2.0	0	0	0	0	0	0	0	1.1	14.8
1947	3.9	1.5	6.8	0	0	0	0	0	0	0	0.6	2.4	15.2
1948	2.0	7.5	0.7	0	0	0	0	0	0	0	T	2.5	12.7
1949	1.9	1.7	3.5	0.3	0	0	0	0	0	0	T	1.0	8.4
1950	0.5	7.7	3.6	0.5	0	0	0	0	0	0	6.3	15.7	34.3
1951	3.9	5.5	8.4	0.1	0	0	0	0	0	0	10.8	0.3	37.0
1952	2.7	6.7	2.0	0	0	0	0	0	0	T	0.1	3.8	15.9
1953	2.6	0.1	4.4	1.0	T	0	0	0	0	T	0.9	0.9	11.3
1954	0.4	1.6	1.5	T	T	0	0	0	0	T	0.9	2.6	7.0
1955	5.0	2.7	5.0	0	0	0	0	0	0	T	4.5	2.5	19.7
1956	7.2	10.3	5.4	0	0	0	0	0	0	0	3.1	2.8	28.8
1957	4.6	T	5.0	2.3	0	0	0	0	0	T	0.2	3.5	15.6
1958	2.0	1.2	1.4	T	0	0	0	0	0	0	3.2	1.8	9.6
1959	5.9	3.9	8.7	T	0	0	0	0	0	0	2.4	1.4	22.3
1960	4.2	12.7	20.9	T	0	0	0	0	0	0	1.3	10.9	50.0
1961	4.1	8.6	0.9	4.0	0	0	0	0	0	0	1.8	8.0	27.4
1962	11.3	15.5	4.5	4.8	0	0	0	0	0	T	T	4.5	40.6
MEAN	4.8	5.1	4.3	0.7	0.0	0.0	0.0	0.0	0.0	0.1	1.6	4.5	21.1