

# **HISTORY OF WEATHER OBSERVATIONS**

## **Peoria, Illinois**

### **1855-1959**

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The Weather Kiosk in downtown Peoria, Illinois.  
Peoria Historical Society Collection, Bradley University Library.

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## **INTRODUCTION**

### **Executive Summary**

Weather observing in Peoria, Illinois, began in 1855 when Dr. Frederick Brendel started taking observations for what would turn out to be a life long pursuit. Dr. Brendel continued observing for 50 years, ending in 1905. The U.S. Department of Agriculture's Weather Bureau constructed a building on the campus of Bradley Polytechnic Institute (now Bradley University) opening the new observing site in February 1905. The Weather Bureau moved to the new airport in March 1935, remaining in the Administration Building through October 1959.

### **Goal of the Study**

The goal of this study is to document the primary weather observational path at Peoria, Illinois, leading to the current and on-going National Weather Service observing program. The challenge was to identify and define the roots of the path that began in the 1850s. Though other weather observers have been in the Peoria area those not considered part of the original path have been excluded from this study. This does not minimize the importance of these collateral observations, but does allow for the focusing on the formal weather observing program that continues to this day.

Throughout the research for and preparation of this study, the goal was to produce a document that future studies can use to evaluate the validity of the data that were collected here, judge the trustworthiness of the observers who collected them, and determine the climatological significance of any variability or change discerned.

## LOCATION OF OBSERVATIONS

### Location Map



Map 1. The locations of weather observing sites in Peoria, Illinois, 1856 – 1959.

### Location Descriptions

Dr. Frederick Brendel, M.D., recorded observations in Peoria at several different locations as listed below. These locations are all within a few blocks of each other in downtown Peoria as shown in Map 1. Combining the information on location and dates found in the *Local Climatological Data – Annual 1965* (and the Peoria Climate Record Books) with information found on the original forms, the dates for each street address are as follows:

1855 – 1862	Corner Washington and East Franklin Streets
1863 – March 1865	72 South Adams
March 1865 – 1868	Corner Water and East Franklin Streets
1869 – May 1872	Corner Pecan and Meyer Streets
May 1872 – May 1884	202 Liberty Street

May 1884 – 1888	315 Harrison Street
1889 – September 1905	701 Fourth Street (Figure 1)

Elevation change on 10 March 1865, with note “460 (since March 10, 15 feet lower) 445, 25 feet above low water mark”

Elevation change on 27 May 1872, from 440 feet to 460 feet

Note on May 1884 form indicates “Moved this month two squares off the old place and about 15 feet higher up.”

Elevation change in July 1885 from 475 feet to 490 feet



**Figure 1. The home of Dr. Frederick Brendel at 701 Fourth Street, Peoria, Illinois. Exact date is unknown but circa. 1900.**

**Source: Peoria Historical Society Collection, Bradley University Library.**

The observing program in Peoria moved to the new Weather Bureau Building on the campus of Bradley Polytechnic Institute (now Bradley University) in February 1905. Dr. Brendel turned over his 50 years of records to the new Weather Bureau station. The building, built in 1904, was at 101 South Institute Place. Observations continued at this location until 15 August 1944.

The Weather Bureau established an observing site at the Peoria Airport on 1 July 1939, being located in the Administration Building (Figure 2.) It remained in this

location until October 1959, when the site moved across the airfield to the new Administration Building.



**Figure 2. The Peoria, Illinois, airfield circa. late-1930's. Weather observing was conducted from the Administration Building.**

Source: Greater Peoria Regional Airport archive.

Mr. M. A. Breed served as a Smithsonian observer from February 1861 to February 1862. He took observations at Breed's City Drug Store. An address for this location was not found.

### **Instrumentation Descriptions**

Information on the exact location and types of instruments that Dr. Brendel used is quite sketchy. Having served under three different agencies (Smithsonian Institution, 1855-March 1875; U.S. Signal Service, April 1875- June 1892; and the U.S. Weather Bureau, July 1892- September 1905) it might be assumed that he used standard instruments provided by these agencies.

From a newspaper account we find "On January 8, 1856, the thermometer on the door of Dr. Greenleaf's Drug Store, on Adams Street, registered twenty-one degrees below zero, whereas Dr. Brendel's reading was only 15 below. Dr. Brendel agreed

however, that the Greenleaf reading was possibly correct as his own reading was taken five feet above ground.”

The 1883 Thermometer Survey for Peoria, as conducted by the U.S. Signal Service, indicates that the thermometer bulbs were four and half feet above the ground; two yards from the nearest building or tree; the thermometers are always in the shade; the wall or fence the shelter was attached to faces the northeast; the frame is made of three boards six inches wide open below, the thermometers fastened with transverse thread, thermometers all glass; the location is a yard, open to the northeast, from west-south to east brick building, ground is earth.

From the Climate Record Book entry from the early 1900's the following was recorded:

“Established December, 1855; latitude, 40 deg, 43 min N., longitude 89 deg 43 min W.; elevation 519 feet.

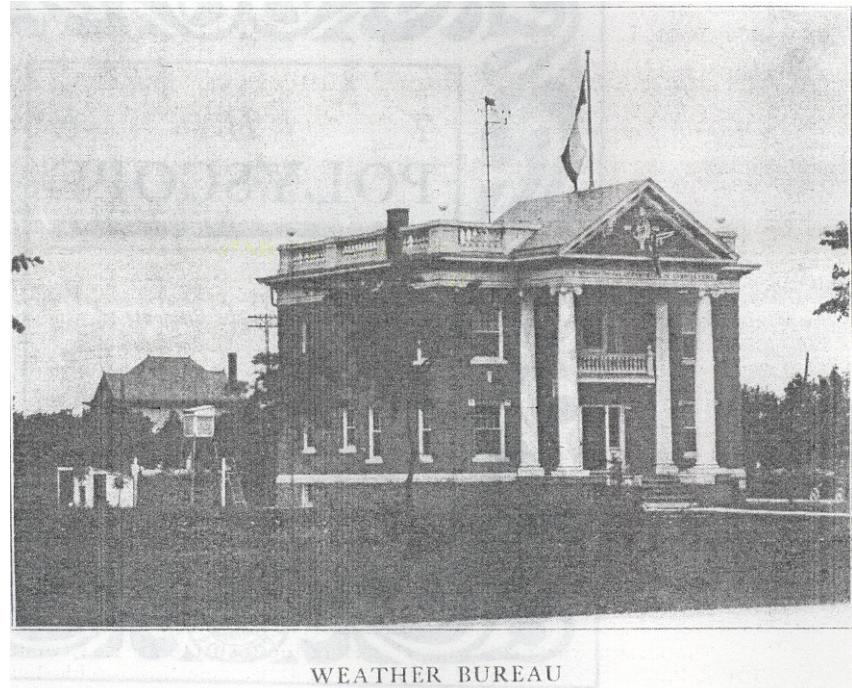
This station is located in the southern portion of Peoria County, close to the Illinois River. The ground rises in parallel terraces, with N.E. to S.W. trend, from the river; and the station is situated on the first terrace. The full force of northwesterly winds is somewhat broken by the abrupt wall of the second terrace, thermometers on the latter showing uniformly lower readings, during the prevalence of northwesterly winds, than are recorded at the station.

The maximum and minimum thermometers have been exposed since October, 1896 in a standard instrument shelter north of Dr. Brendel's home. The shelter opens toward the north, and the thermometers are 7 feet above the ground.

The rain gage is 36 feet north of the house in an open yard clear of trees.”

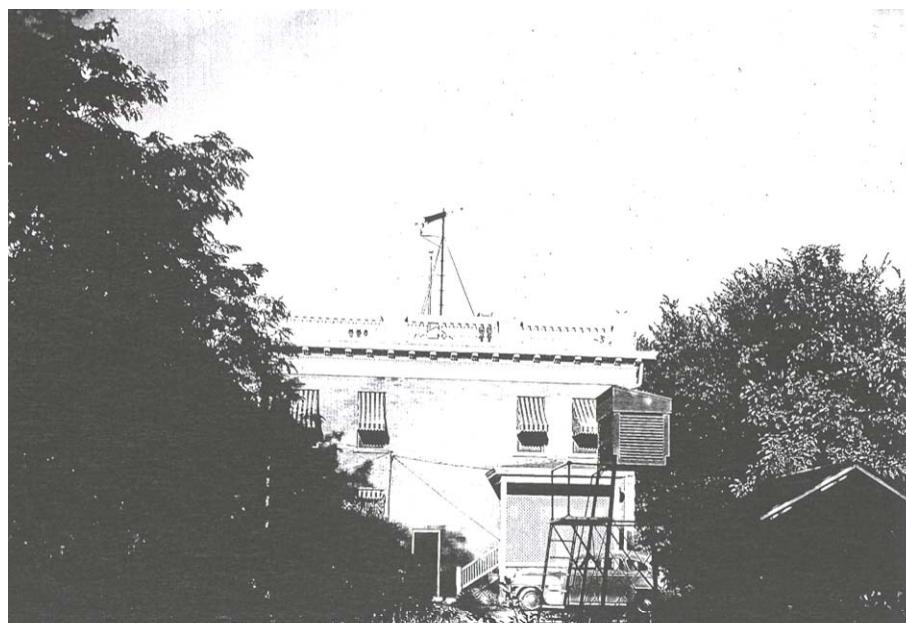
There is more complete information concerning the instruments for the Weather Bureau location at 101 Institution Place. The thermometers were at 11 feet above the ground and the tipping bucket rain gage at four feet. The barometer elevation was 609 feet as was the elevation of the station. The anemometer was at 45 feet on the roof of the building. The station also had a barograph, thermograph, and a triple register (Figures 3 and 4.)

Joseph Adam's history document lists other instruments present at this location, however, no location or elevation information was discovered. The history indicates “Among them [the instruments in 1905] were two mercurial barometers, two anemometers for wind measurements, two eight-inch rain gages, a tipping bucket rain gage, two sunshine recorders, on thermograph, and a variety of wet and dry bulb and maximum and minimum thermometers.”



**Figure 3. The Weather Bureau Building on the campus of Bradley University, 1906. The location of the instrument shelter (left) and the anemometer (roof) can clearly be seen.**

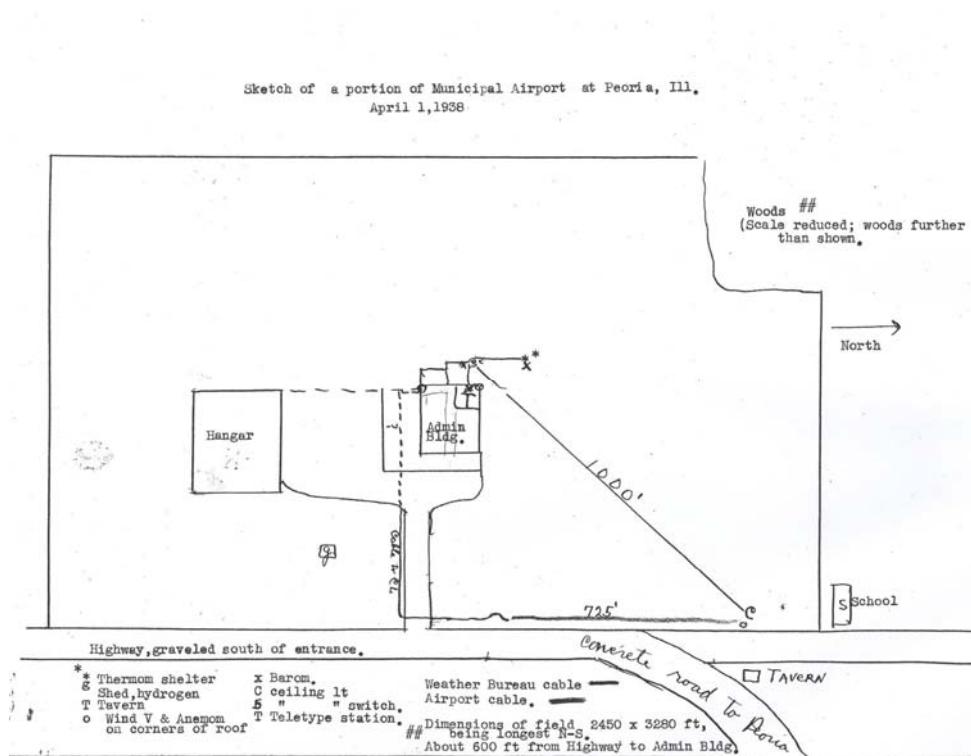
Source: Peoria Historic Society, Bradley University Library.



**Figure 4. The Weather Bureau Building on the campus of Bradley University in 1942. The location of the instrument shelter (left) and the anemometer (roof) can clearly be seen.**

Source: Official station history files, National Climatic Data Center.

The move of the observing program to the Peoria airport brought about a change in instrument exposure (Figure 2.) The shelter is the white object at the end of the sidewalk to the left of the Administration Building. Figure 5 details the exact location as of 1 April 1938. The thermometers were now at six feet above the ground, the eight-inch rain gage, installed in March 1936, was at four feet. The anemometer was at 20 feet through January 1939 when it was moved to 25 feet. Station elevation was 654 feet above sea level.



**Figure 5. The location of weather instruments at the Peoria, Illinois, airport on 1 April 1938. For photograph of location see Figure 2.**

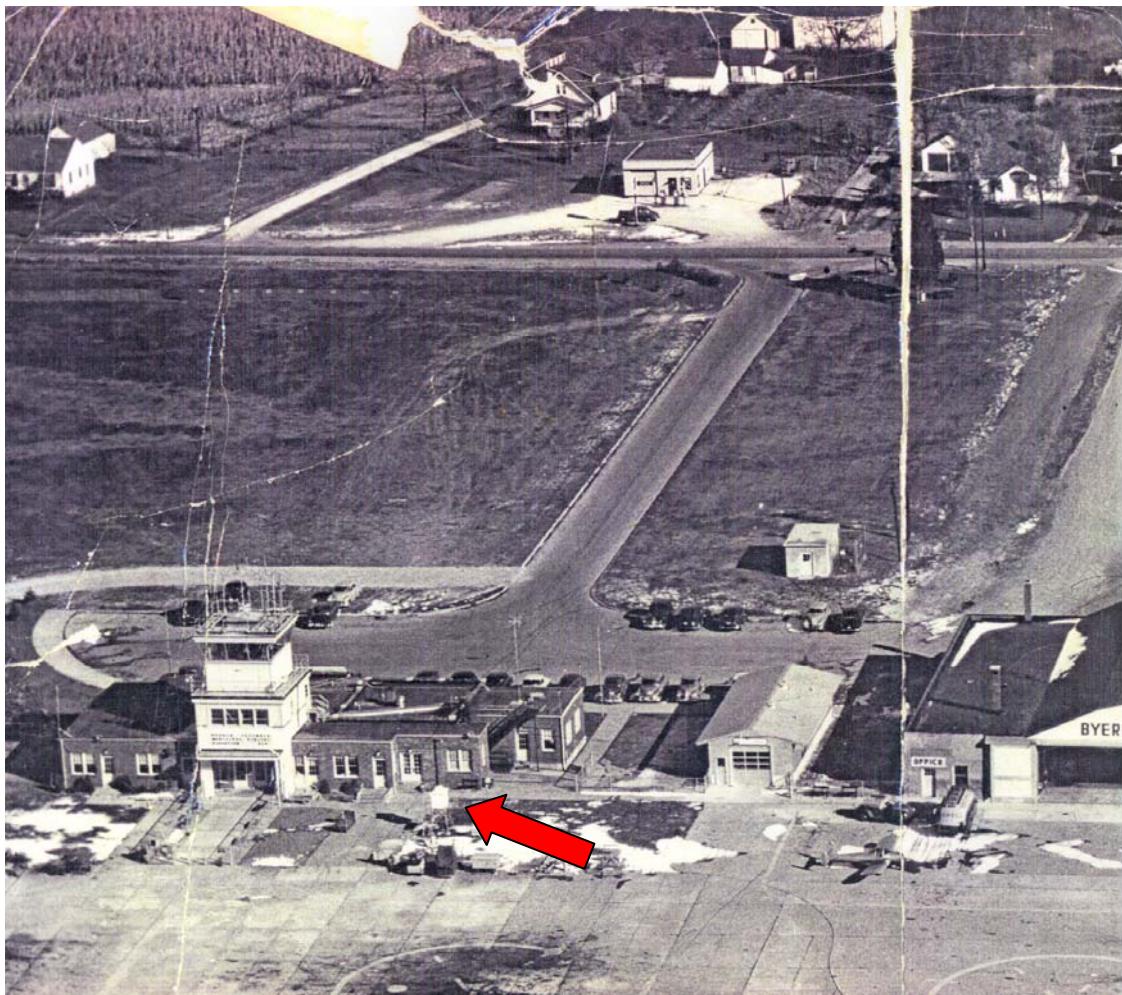
Source: Official station history files, National Climatic Data Center.

In May 1943, the airport-city office was consolidated. The recording instruments, including the triple register were moved from the Bradley Campus building to the airport. The instruments were all reported to have excellent exposure.

With the Weather Bureau addition to the Administration Building during the first six months of 1945, the rain gage and instrument shelter were relocated twice.

For the remainder of the time at this location the instruments remained unchanged. The thermometers were at seven feet above the ground, the tipping bucket

rain gage at four feet, and the eight-inch rain gage at three feet. The anemometer was moved from 28 feet to 50 feet on 22 November 1948. However, it must be mentioned that according to photographic evidence the instrument exposure was not very good (Figures 6 and 7.) Notice that the runways and taxi ramps have been paved, as of August 1942, instead of the original red shale paving.



**Figure 6.** An aerial view of the Peoria, Illinois, airport circa 1950. Notice instrument shelter just outside the Administration Building to the right of the tower.  
Source: Greater Peoria Regional Airport archives.



**Figure 7. A close up of the Administration Building and instrument shelter at the Peoria airport, circa 1950. Notice the shelter just above the helicopter's rear rotor and the rain gage just below the rotor.**

Source: Greater Peoria Regional Airport archives.

## APPENDIX - Observer Stories

### Dr. Frederick Brendel

Much of the following was excerpted from the document *A Historical Sketch of the Peoria Weather Bureau including the Pioneering Era of Dr. Brendel* by Joseph B. Adams, Jr., 1961. Those interested in the full account of the history of Dr. Brendel (and the Weather Bureau in Peoria) are encouraged to read the entire 21 page document. The document is archived at the Peoria Historical Society, Bradley University Library.

"He was born on January 20, 1820, in Erlangen, Bavaria, to an honored and respected family, the Brendels. Frederick was a bright boy, fond of the fields, woods, and ponds where he would often play hooky from Sunday School. His collecting days came early, for he was a nature lover from the very beginning. In Latin school he claims he had a great battle with this strange dead language, but in

the end he won, and later, at the age of 23, he graduated as an M.D., with high honors, from the University of Erlangen, then celebrating its Centennial year. Several years afterwards, due to his strong political convictions, in which Dr. Brendel was at times quite outspoken, he was prevented from practicing medicine, so he decided, as many others of this time did, to go to America. This he did. After a short migrating period, much of it spent in botanizing, generally westward, he arrived at St. Louis, in 1850, and two years later in Peoria, on Water Street. In the period of 1852-55 he not only built up his practice, now at an office in a drug store on the corner of Bridge and Water Sts, but also investigated the countryside and spent many hours over gradually acquired technical books, which were his constant companions.”



**Figure 8. Dr. Frederick Brendel, 1820-1912, medical doctor, botanist, and weather observer in Peoria, Illinois for 50 years.**

**Source:** Peoria Historic Society, Bradley University Library.

“In a work he had published in 1887, *Flora Peoriana*, Dr. Brendel included a great deal of his weather observations. The key to his personal endeavors may be found in its preface. He writes... “The contents of this essay are the result of 35 years observations on the vegetation of a small area of about 300 English square miles. It is intended to show how local Floras should be treated to phytogeography; how notice should be taken of soil and climate, to understand the vegetation of a certain floral district...”

“And we find the following in his General Remarks on the Distribution of Plants.... “When we study the history of a country, we ought to be acquainted

with its geography, its physiognomy of the landscape, its climate and the physical qualities of its people. All these things will influence the moral character of the people and only in that way, combining cause and effect, we will gain a clear view of its history.”

“Dr. Virginius Chase wrote an article on the life of Dr. Brendel, which appeared in the Transactions of the Illinois State Academy of Science, Vol 24, No 2, pages 72-79, December, 1931. To illustrate the character and devotion of this man, Dr. Chase includes these two brief paragraphs..... “One day in early Autumn he [Dr. Brendel] set out alone on foot among the bogs of the Illinois river bottom to gather seed of Lobelia Cardinalis for friends in the Fatherland. In the tall timber, twilight comes early, and becoming lost he floundered among the hammocks until nearly exhausted. At last he spied a light in a farm house at the foot of the bluffs, and finally long after dark managed to reach it, his family after a sleepless night were overjoyed to see a farmer’s wagon come up the street bringing their beloved father to them once more. His first words were, “Did you remember to read the thermometer?”

“In the Weather Bureau handbook, *The Cooperative Observer*, we find in Chapter Two, entitled Devotion to Duty of Cooperative Weather Observers, the following... “Peoria, Ill... Dr. Friedrich Brendel, M.D., observer at Peoria for about 50 years, was a physician of excellent standing, a botanist of note, and author, and a man of scientific tastes and deep devotion to his work. It is related of him that in his later years while seriously ill and lying apparently unconscious, he would rouse regularly about observation time and direct the nurses to read the thermometers.”

“So in his declining years at the home of his eldest daughter, Dr. Brendel still continued his studies and observations, until finally on the afternoon of August 10, 1912 during his long accustomed “coffee time” around 3 pm, Dr. Frederick Brendel stepped into eternity. According to his request, his body was cremated, and in the land of his birth the ashes were strewn partly on the water and partly in the woods. Thus ended the Pioneer era of Dr. Brendel.”

## **The Weather Bureau**

The story of the early Weather Bureau in Peoria was similar to what was happening all over America. From 1891 until 1904 the Weather Bureau built, equipped, and operated about 27 stations. Again from Adams’ history of Peoria we find:

“In the process of building during 1904 was the W. B. site at Peoria, on the campus of Bradley Polytechnic Institute. Cost of the lot to the government, a token sum of \$54.00, building cost \$7,915.00. In the same year, the third convention of W. B. officials was held at Peoria, Sept 20-22. These conventions

were highly regarded, as they gave opportunity for exchange of technical data and the discussion of various methods for advancing the work and scope of the W.B. "

The program and menu for the evening meal held during the third convention is shown in Figure 9. Professor Willis L. Moore was the Chief of the Weather Bureau, the Honorable Joseph V. Graff was the Congressman representing Peoria, and Professor Cleveland Abbe was an early leader in the meteorological community.

M E N U			
LITTLE NECK CLAMS		Introduction of Toastmaster:	
		By Prof. Willis L. Moore,	Washington, D. C.
CELERY		Toastmaster:	
		Hon. Joseph V. Graff,	Peoria, Ill.
BOUILLION		RESPONSES:	
RADISHES	QUEEN OLIVES	A Contribution to History,	
		DR. Wilford M. Wilson,	Milwaukee, Wis.
WHITE FISH		The Bradley Institute and the Weather Bureau,	
SHOE STRING POTATOES		Dr. Oliver J. Bailey,	Peoria, Ill.
BRAISED SWEET BREADS AUX CHAMPIGNONS		Brotherhood of the Service,	
PEAS		Prof. Cleveland Abbe,	Washington, D. C.
ROMAN PUNCH		Wind and Weather,	
SQUAB	POTATO CROQUETTES	Capt. George P. Blow, U. S. N.,	LaSalle, Ill.
		The Dignity of the Service,	
LOBSTER MAYONNAISE		Mr. James H. Scarr,	Sacramento, Cal.
ICE CREAM	ASSORTED CAKES	Peoria,	
ROQUEFORT CHEESE	WAFERS	Hon. John S. Stevens,	Peoria, Ill.
CAFE NOIR		Some Aids to Research,	
WEDNESDAY EVENING, SEPT. 21ST.		Dr. Oliver L. Fassig,	Baltimore, Md.
NATIONAL HOTEL,		Auld Lang Syne,	
PEORIA, ILL.		Prof. Alexander G. McAdie,	San Francisco, Cal.

**Figure 9. Menu and program from Weather Bureau convention held in Peoria, Illinois, 20-22 September 1904.**

Source: Special Collections Center, Bradley University Library.

According to a Peoria Journal article written on 25 September 1904, "Mr. Scarr, in speaking of the dignity of the service, said there was no more dignified and important position occupied than that of chief of the weather station in a given locality. The weather man, he said, must be a good citizen, must be honest, must be industrious, must

be temperate, must be loyal, loyal to himself, to his community, loyal to the district forecaster and loyal to the chief. Speaking of loyalty to a community he qualified the general statement by saying no weather man should build up a community at the expense of others by false or impartial predictions."

Now back to the establishment of the Weather Bureau office in Peoria as told by Joseph Adams:

"During the summer of 1904, the erection of the W.B. building at the Bradley campus was begun on a lot granted by the Institute. Groundbreaking was attended by Congressman Graff and Pres. Bailey. The cornerstone ceremonies took place on Sept. 7, 1904. Enclosed in a copper box was weather bureau correspondence leading to the selection of the site, Bradley publications, and 6 Peoria newspapers of Sept 6<sup>th</sup>, 1904. Fifty three years later, in 1957, when this bldg. was being torn down, the cornerstone was located by Professor Phillip Becker. Later he broke open the cornerstone and removed the contents of the copper box in the presence of Dr. Harold Rhodes who was then President of Bradley University."



**Figure 10. Groundbreaking ceremony for the new Weather Bureau Building on the Campus of Bradley Polytechnic Institute, Peoria, Illinois, 7 September 1904. The Honorable Joseph V. Graff presiding.**

**Source: Peoria Historical Society, Bradley University Library.**

"Getting back to 1904-05, the red brick building went up on the corner of Institute and Main, facing East. Exposed instruments were housed on the roof and a wooden flagpole flew the various pennants symbolizing the state of the weather. These flags ere identical to the storm signal flags used on the Great Lakes, begun

in the 1870's, one of the primary functions of the Signal Service of the U.S. Army."

"The main structure was fronted by a porch, the peaked roof of which was supported by four tall wooden columns. I believe the style can be called Colonial, or early American. There was a basement with coal & heater rooms, storage room, a printing and map room, and laundry room. The main floor had 4 rooms and consisted of a private office for the official in charge, a main office with instrument stands, barometer, barograph and work tables, a dining room and kitchen. The hall contained a handsome staircase of mahogany, the floors thru out the building being hardwood. The upper floor was the residence of the official in charge."

"Work of grading the grounds was begun in December of 1904, but was not finished until the following year when it was also planted with trees and shrubs, and seeded with grass. Much money and effort was put into maintaining a well-kept appearance of the grounds."



**Figure 11. Dewey A. Seeley, first officer in charge at the Peoria Weather Bureau station in Peoria, Illinois, 1904-1909.**

Source: Peoria Historic Society, Bradley University Library.

"Mr. Dewey A. Seeley was assigned to open the station as Peoria's first official observer on Feb 1, 1905. He was aided by an assistant observer, Mr. William T. Lathrop. There was a succession of messenger boys, Mr. George E. Turner was the first one. He was later made assistant observer. Mr. Seeley and Turner both left in 1909. A Mr. L.M. Sullivan was observer from April 1908 to April 1913. Another new man came in 1909, he was Merton L Fuller, who was assigned to Peoria for duty as assistant, on Aug. 17, 1909. Mr. Fuller's long service as

official in charge is now also a legend. He retired at the age of 70, in April of 1942, after 33 years of service at Peoria."

In order to inform the public about the weather conditions and forecasts, the Weather Bureau installed a kiosk in downtown Peoria. Adams describes the event,

"In October of 1911 the downtown "kiosk" foundation was started but the iron work was not completed until June of 1912. Instruments were installed on June 29<sup>th</sup>. This kiosk or "show" center was maintained on the Court House Square at the corner of Main and Adams streets. It housed thermometers, a thermograph, and aneroid barometer, hygrometer, and recording rain gage. Weather maps, bulletins, charts, and other information was also posted there. It was probably the job of the messenger boy to do the posting, and to return to the WB office with the readings of the various instruments. The downtown kiosk was apparently a quite popular feature as it lasted until about 1936 or so, when the instruments were removed."

An undated picture of the kiosk, from the Peoria Historical Society, is shown on the front cover of this report.

It is also to be noted that Peoria was the site of an upper air observing unit. A newspaper article from January 17, 1906, tells of the selection of Peoria as one of the first sites in America to be so honored. To quote the Journal article, "The Peoria station has been selected as one of those from which balloons will be sent up for a study of conditions in the upper atmosphere. The importance to Peoria of this decision of the government may be judged by the fact that very few stations in the country are similarly equipped. These balloons are sent up from day to day and are fitted with instruments for recording the temperature at given heights, the vapor, pressure and wind velocity. Two kinds of balloons are used, and some of them frequently go to a height of ten miles."

However, this announcement might have been quite a bit premature as no records of such upper air observations can be found at Peoria until the 1950's. The Adams' history document records the following:

"Then in April, 1956 the survey for transfer of the Air Force upper air program from Chanute Field to Peoria was begun, and in August, preliminary plans were made for the takeover."

"In September, 6 upper air specialist observers arrived in Peoria to man the new unit, and on Sept 12, 1956 four upper air observations a day were officially begun from temporary GM trailers near the old terminal building. A large tent was used as an inflation shelter. A new metal building was constructed for the upper air office, and was ready in April, 1957."



**Figure 12. The upper air observing equipment at the Peoria, Illinois, airport sometime between 1956 and 1959.**

**Source:** Greater Peoria Regional Airport archives.

## REFERENCES AND DATA SOURCES

Observational forms as found in the National Climatic Data Center archives

Station history forms as found in the National Climatic Data Center files

1883 Thermometer Survey conducted by the U.S. Army Signal Service

Peoria Historical Society Collection, Bradley University Library

*A Historical Sketch of the Peoria Weather Bureau Including the Pioneering Era of Dr. Brendel*, by Joseph B. Adams, Jr., U.S. Weather Bureau, 1961

Greater Peoria Regional Airport