HISTORY OF WEATHER OBSERVATIONS
VEVAY, INDIANA
1864-1948

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INTRODUCTION

Introduction

One of the earlier State Climatologists for Indiana, Lawrence A. Schaal, worked for the U.S. Weather Bureau and for the Agronomy Department of Purdue University at Lafayette, Indiana. He wrote about the first weather observers in Indiana with great admiration. He noted that weather records from the 1800's were not numerous and that there was no facility to summarize data from around the State into a form for climatological study. He identified New Harmony, Indiana as the first lengthy observations on record within the State. The record extended from 1 January 1826 to 31 January 1829. Subsequently their temperature and precipitation data were almost completed between June 1853 and March 1883.

He also described the early efforts by the Surgeon General and the Signal Service to collect and analyze weather data. In 1818, Joseph Lovell as Surgeon General of the United States Army ordered each Army Post's Surgeon to keep a diary of the weather and to note everything of importance relating to the medical topography of his station, the climate, and diseases prevalent in the vicinity. As part of that effort, the Post Surgeon at Newport Barracks, Kentucky began the weather observations about 40 air miles up river from Vevay, Indiana on 1 July 1825. The record from Vevay began in the early 1800's but the earliest of those observational records are lost. The second observer there began a new record beginning in 1864. That was about thirty-four years after those in Newport Barracks in Kentucky.

The population in the western United States had grown rapidly and Switzerland County, Indiana shared in that growth. It grew to over 13,000 by the 1880 U.S. Census. Vevay was large enough to earn its own city map in an atlas of that day but did not exhibit that degree of significant growth as the County as a whole had.

This paper examines the station history of Vevay and its earliest observers.

Goal of the Study

The goal of this study is to document the primary weather observational history at Vevay, Indiana that was part of the path to the current National Weather Service's observing program. Climatic data from Vevay's weather observations throughout the period of record are readily available from the National Climatic Data Center, the Midwestern Regional Climate Center, and

the State Climatologist of Indiana. The station's history since 1947 is well documented and also available through easily obtainable climatic records. The challenge of this study was to identify Vevay's role in the development of the formal weather observational program and where it fit in the route from the Army surgeons, through the Smithsonian Observers, the Signal Service Observer Sergeants, the Weather Bureau meteorologists, to the National Weather Service observational network of today. Therefore, the focus of this study is on the period before 1948, the generally accepted start of the modern era of the documentation of weather observations.

LOCATION OF OBSERVATIONS

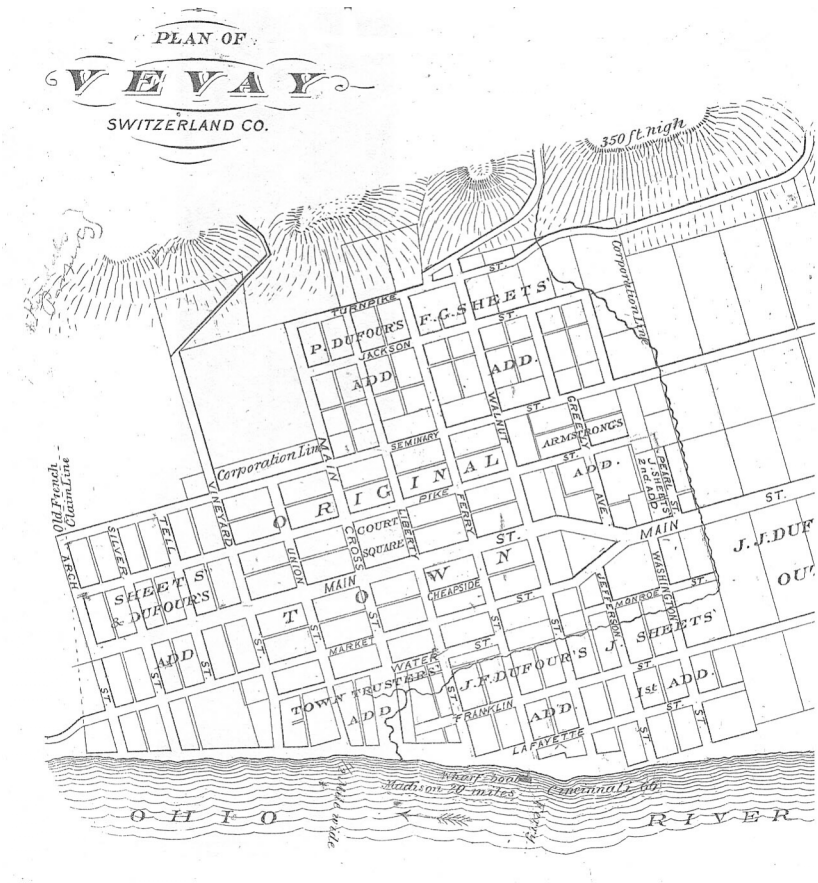


Figure 1. Vevay Indiana in 1876.
Source: Illustrated Historical Atlas of the State of Indiana 1876

While Switzerland County was expanding, another important change had occurred during that growth period. An Act of Congress on August 10, 1846 created the Smithsonian Institute under terms of the will of James Smithson of London. Those terms were for it to increase and diffuse knowledge among men. It was and is a research organization. Within a year after their creation, they developed a climate network. On 1 August 1864, Charles G. Boerner began recording weather observations three times per day in Vevay as part of the Smithsonian Institute network. Seven years later, the network had additional observers reporting from Indiana and from each of the other thirty states. By 1860, it had over 600 observer stations and the Smithsonian Institute had supplanted the Army's network as the primary climatic data collection agency for the United States.

Location of the Observations in Vevay

The latitude and longitude on the first weather observational record was in error. It was corrected to 38˚ 46’ 0” north latitude and 84˚ 59’ 20.5” west longitude with an elevation of 525 feet.

There are two possible locations for the site that those coordinates attempt to locate. The first is Mr. Boerner’s business address. He was a jeweler and watchmaker who had a shop on Main Street (Figure 2) opposite of the First National Bank.

Figure 2. Boerner ad
Source: Vevay Reveille, Vol. 72, No. 12 page 1, 21 March 1889

The second possible and most likely location for the observational site is at his home. The Historical Society’s Museum in Vevay has a funeral invitation to the Charles Boerner home on Pearl Street in Vevay when one of his children died. A Weather Bureau “Description of Cooperative Observer’s Station and Instruments” prepared in 1906 by Frederica Boerner (Charles’ daughter) states that her observations were made at the home. She wrote that the

instrument shelter was about twenty feet from any high building, faced the southwest, and the thermometers were about five feet above sod. The rain gage was on "an outer post of an upper porch uncovered; 15 feet above ground.

Pearl Street in 1883 (Figure 3) had few houses, one of which was theirs.

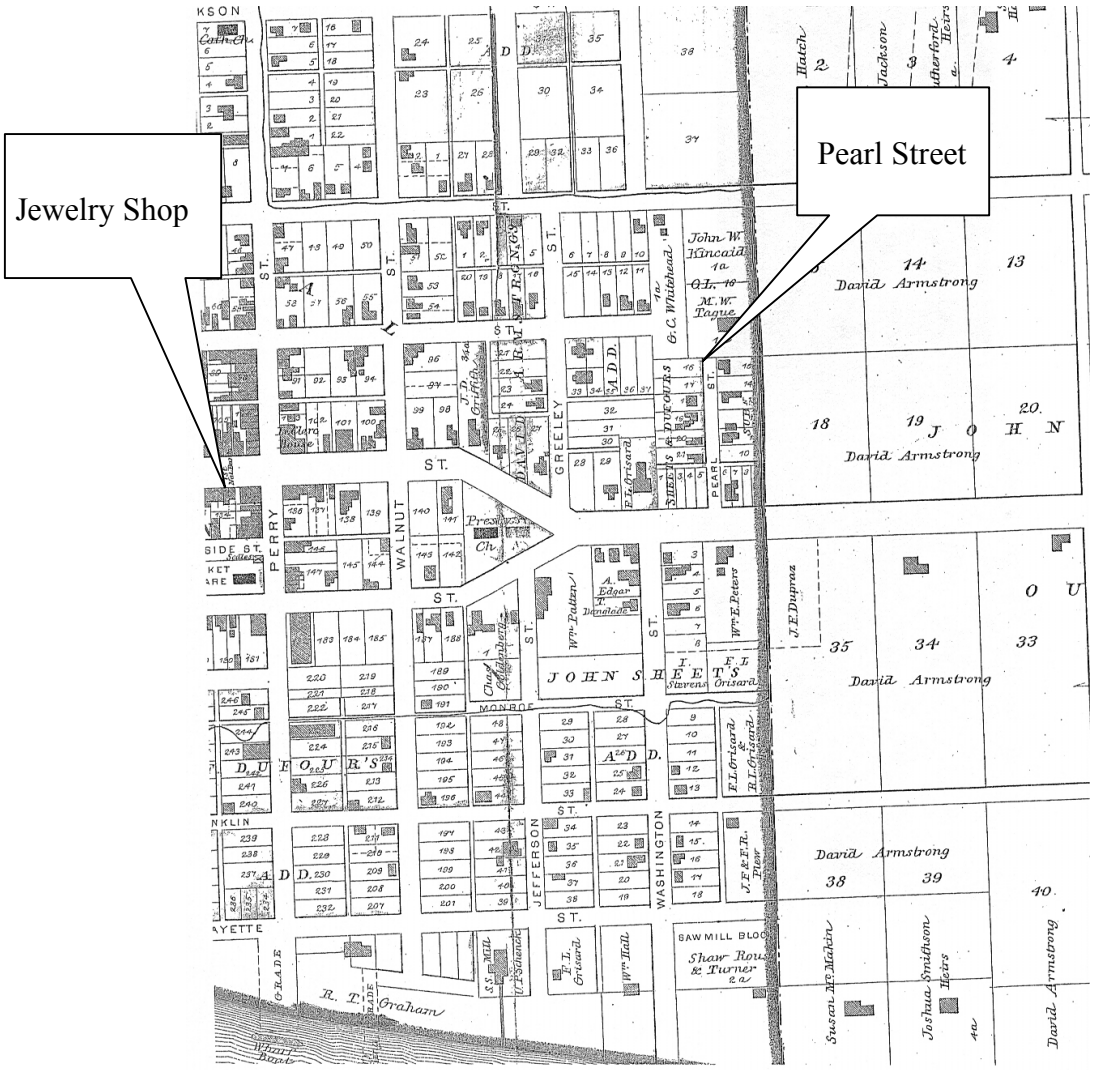


Figure 3. The Area of Vevay with Charles G. Boerner's Home and Business in 1883
Source: Adapted from Illustrated History Atlas of the State of Indiana, 1876

The Pearl Street location was within an easy walk from his business location downtown. The Smithsonian Institute required that observations be recorded three times per day. The afternoon entries were to be made at 2 p.m. and that would have necessitated a round trip to his home each workday to make it. That requirement made the selection of a dedicated observer

critical to the development of a reliable long-term record. They found such persons in Charles G. Boerner and in his daughter Frederica.

The latitude, longitude, and elevation remained unchanged as the basic location of the observation site. Additional comments were added over the years that further defined it. For example in October 1867, he gave elevation in a different way. That was 81 feet above the low water mark in the Ohio River. That was an important fact because the Ohio River occasionally flooded into the town. Pearl Street was not within the frequent flooding zone.

In 1912, an Inspection of Substation report by the Weather Bureau had additional comments about the instrument exposure.

> There is no shelter at this station, the thermometers being exposed on a deep porch, covered with vines, so that there is no direct radiation. The rain gage is a small one, the property of the observer. It was made by her father, who was an expert jeweler and watchmaker. He was observer for many years prior to his death, making reports to the Smithsonian Institution from 1865. Summaries of the data are in the hands of the present observer. Mr. Boerner was educated at Heidelburg; and was well acquainted with the late Professor Abbe, assisting him in Cincinnati for some time in the sixties.

In 1921, the station was moved about two miles east of Vevay at the home of Graham Bondurant. It was equipped with a Cotton Region Shelter located over sod 42 feet from the home with a door that opened north. The rain gage was 45 feet from the home with the top 2 feet 8 inches above ground.

In 1923, the station was moved to Dam No. 39 that was located about six miles from Vevay. The location was identified as 38˚ 47’ north latitude, 84˚ 58’ west longitude, and an elevation of 482 feet MSL. The Cotton Region Shelter was over sod in front of Mr. Bondurant’s residence. The exposure was described as excellent.

In 1960, the station was renamed Markland Dam with as station number of 125381. Subsequently, it was moved back to Vevay and assigned the number 129080.

THE VEVAY OBSERVERS

In the 1850 U.S. Census, the 1st Ward, of Hamilton County, page 71, Charles Boerner was listed as living in Cincinnati, Ohio. He was then at age 24 and was a watchmaker. According to the 1860 U.S. Census (15th Ward, Cincinnati, Hamilton County, Ohio, Page 84), Charles Boerner was a Watchmaker who had been born in Saxony. He apparently was successful because his personal property was worth $1,200 and his real estate was worth $6,000. Four years later, he moved to Vevay, Indiana. He immediately began the meteorological observations in his new hometown. Dr. Schaal said in his paper that Charles Boerner had a personal acquaintance with Cleveland Abbe who was becoming a leading player in the development of observational networks in the United States.

The 1860 Census of Michigan identifies Cleveland Abbe living in Washtenaw County. On Roll 563 Book 1, Page 530 of that census, he is identified as a white male, 23 years old, with $500 in personal property, who was born in New York. He was living in the Ann Arbor household of 45 year-old James R. Boire whose occupation was Professor of Greek Language and Literature. Cleveland Abbe's occupation is listed as "Tutor Michigan University." We now know that the observer there would later become one of the most famous meteorologists in our history. When and how Boerner met Abbe isn't known for sure but Boerner was in Adrian, Michigan some sixty miles south of the University until he moved in 1849.

Charles Boerner moved from Cincinnati, Ohio to Vevay, Indiana in 1864. In the City Directory of Vevay in 1887, he was identified as having a Jewelry business on Main Street between Liberty and Ferry Streets. His residence was listed as being on Pearl Street north of Main Street.

A biography of Charles G. Boerner appears in the History Of Switzerland County Indiana published in 1885. It is included here as evidence of his qualifications and professionalism.

> **CHARLES G. BOERNER**, the leading watch-maker and jeweler of Vevay, Ind., was born April 14, 1827, at Artern, in Prussian Saxony. He received a liberal education; is a graduate of the high schools of Artern and the college of Erfurt; also took a special course in chemistry in the Polytechnic Institute. While yet in his boyhood school days he learned the art of watch-making under the instruction of his father, Charles G. Boerner, Sr., who was a watch manufacturer, born July 25, 1800; a graduate of the university, at Halle; an astronomer of considerable note, and in charge of the observatory at Artern. November 10, 1825, he married Miss Frederica M. LUDWIG, who died in 1834, leaving two sons and two daughters to mourn his loss. Several years after he married Miss Mary MANN, daughter of Prof. August Mann, government inspector of mines, and two children were born of this union of which only Emily, wife of Dr. KING, of Baltimore, survives. After completing his college course, Mr. Boerner decided to avail himself of the experience of others in his profession. He left home

and found employment with Mr. Ferdinand SCHALL, a prominent watch-maker in Leipzia; a year later he was engaged by Mr. Benno KIRCHEL, watch-maker royal to the court of Saxony, and director of the Museum of Art and Science; in connection with this position Prof. REICHENBACH appointed Mr. Boerner first assistant in the Dresden Observatory. In 1847, his father becoming impressed with the grandeur of the great American Republic, resolved to emigrate, and in view of the threatening war cloud of a revolution in Germany, his course became fixed; he disposed of his property, and June 7 the family bade farewell to the dear old home and fatherland. They embarked at Bremen, June 15, and landed in New York, July 30. After a week's rest they proceeded on their journey and arrived at their destination in Detroit, Mich., August 10, 1847.

The father and mother died of cholera, September 10, 1852. Charles G. Jr., the subject of this sketch, located in Adrian, Mich.; in 1849, removed to Cincinnati, where he engaged in the jewelry business with Messrs. Palmer & Owens; in 1853 he entered the firm of Messrs. Beggs & Smith, at that time the most prominent in the jewelry trade, and after the retirement of Mr. Beggs, the firm changed to Smith & Boerner. In 1864 Mr. B. was threatened with declining health, and in search for a rural home, his brother Frederic invited him to Vevay, Ind. Disposing of his interest to his successor, Mr. Harry R. Smith, he formed a partnership with his brother under the name of F.A. Boerner & Bro., the house being established in 1854. In 1877 F. A. Boerner disposed of his interest to his brother Charles G., and removed to Ennis, Tex., where he died October 30, 1880. The business has been conducted since by Mr. Boerner, assisted by his two sons, Carl G. and Gustavus A. The family are members of the Presbyterian Church, of which the father is a ruling elder. Mr. Boerner was initiated in the Masonic order in 1849, and for several years has been secretary of the Switzerland Lodge No. 122, F. & A.M. He is a member of the I.O.O.F., of the encampment (Namoi), and for several terms has been a member of the city council. He is a member of the Am. Association A. Science, the Cincinnati Society of Natural History, and corresponding member of other scientific societies. He has been observer of the United States signal service since its organization, and practically engaged in astronomical and meteorological observations. Through his influence and exertion, the chief signal officer has made Vevay a signal station, receiving daily weather telegrams from Washington, D.C. Mr. B. was married, December 14, 1853, to Miss Josephine THOMAS, of Chillicothe, Ohio, and the children born of this union are Miss Fredie M., Josephine, (wife of J.W. FAULKNER), Carl G., Gustavus A., Emma G., William T., Anna D., and Milton C. Mr.

> Boerner is an exemplary Christian gentleman, and is held in high esteem as such by the people with whom he is associated. His two sons, Carl G. and Gustavus A., who are associated with him in business, are also young men of clever attainments and excellent character. The ancestry of the family dates back to A.D. 1418."

When Charles G. Boerner died in 1899, his daughter Frederica Boerner became the observer. A newspaper clipping of her obituary announcing her death on 27 October 1921 was found in Scrapbook # 4 in the Switzerland County Public Library. It contained this paragraph:

"Miss Boerner was a graduate of Vevay High School and after her graduation at the early age of eighteen from Oxford College, O., was for several years a teacher in the Vevay schools.

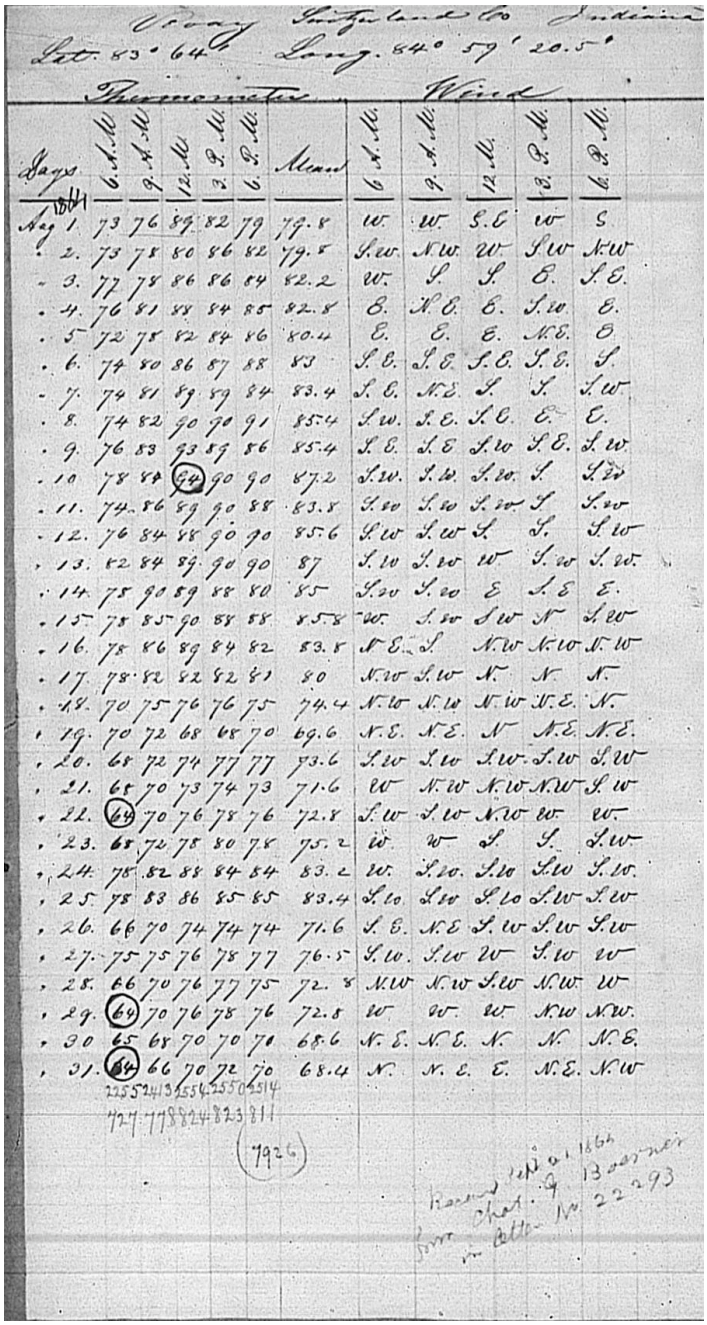
After the death of her father, who was for years a government weather observer, she took up Meteorological work and for twenty years filled the position of Local Weather Observer."

The daughter had maintained and extended the observational record to sixty-two years at the same location and within the same family.

Her replacement was Graham Bondurant. He was the Head Lockmaster at Dam No, 39. His Post Office address was Florence, Indiana but the station name remained Vevay. He began observations on 14 May 1921. By 1923, the observation site was moved to his home at Dam No. 39.

THE VEVAY WEATHER OBSERVATIONS

The first observations by Mr. Boerner were made on a hand drawn form in August 1864 (Figure 4) with six observations each day. His October 1864 record also survives.



Vevay Switzerland Co. Indiana
Lat. 83° 64' Long. 84° 59' 20.5"

Days	Thermometer 6 A.M.	9 A.M.	12 M.	3 P.M.	6 P.M.	Mean	Wind 6 A.M.	9 A.M.	12 M.	3 P.M.	6 P.M.
1864 Aug 1.	73	76	89	82	79	79.8	W.	W.	S.E.	W	S
" 2.	73	78	80	86	82	79.8	S.W.	N.W.	W.	S.W	N.W
" 3.	77	78	86	86	84	82.2	W.	S.	S.	E.	S.E.
" 4.	76	81	88	84	85	82.8	E.	N.E.	E.	S.W.	E.
" 5	72	78	82	84	86	80.4	E.	E.	E.	N.E.	E
" 6.	74	80	86	87	88	83	S.E.	S.E.	S.E.	S.E.	S.
" 7.	74	81	89	89	84	83.4	S.E.	N.E.	S.	S.	S.W
" 8.	74	82	90	90	91	85.4	S.W.	S.E.	S.E.	E.	E.
" 9.	76	83	93	89	86	85.4	S.E.	S.E	S.W	S.E.	S.W.
" 10	78	84	94	90	90	87.2	S.W.	S.W	S.W.	S.	S.W
" 11.	74	86	89	90	88	83.8	S.W	S.W	S.W.	S	S.W
" 12.	76	84	88	90	90	85.6	S.W	S.W	S.	S.	S.W
" 13.	82	84	89	90	90	87	S.W	S.W	W	S.W	S.W.
" 14.	75	90	89	88	80	85	S.W	S.W	E	S.E	E.
" 15.	78	85	90	88	88	85.8	W.	S.W	S.W	N	S.W
" 16.	78	86	89	84	82	83.8	N.E.	S.	N.W	N.W	N.W
" 17.	78	82	82	82	81	80	N.W	S.W	N.	N	N.
" 18.	70	75	76	76	75	74.4	N.W	N.W	N.W	N.E.	N.
" 19.	70	72	68	68	70	69.6	N.E.	N.E.	N	N.E.	N.E.
" 20.	68	72	74	77	77	73.6	S.W	S.W	S.W	S.W	S.W
" 21.	68	70	73	74	73	71.6	W	N.W	N.W	N.W	S.W
" 22.	64	70	76	78	76	72.8	S.W	S.W	N.W	W	W.
" 23.	68	72	78	80	78	75.2	W.	W	S	S	S.W
" 24.	78	82	88	84	84	83.2	W.	S.W.	S.W	S.W	S.W.
" 25.	78	83	86	85	85	83.4	S.W	S.W	S.W	S.W	S.W
" 26.	66	70	74	74	74	71.6	S.E.	N.E	S.W	S.W	S.W
" 27.	75	75	76	78	77	76.5	S.W.	S.W	W	S.W	W
" 28.	66	70	76	77	75	72.8	N.W	N.W	S.W	N.W.	W
" 29.	64	70	76	78	76	72.8	W	W.	W.	N.W	N.W.
" 30	65	68	70	70	70	68.6	N.E.	N.E.	N.	N.	N.E.
" 31.	64	66	70	72	70	68.4	N.	N.E.	E.	N.E.	N.W

225524 | 19554 | 2550514
727 | 778824 | 823811
(7926)

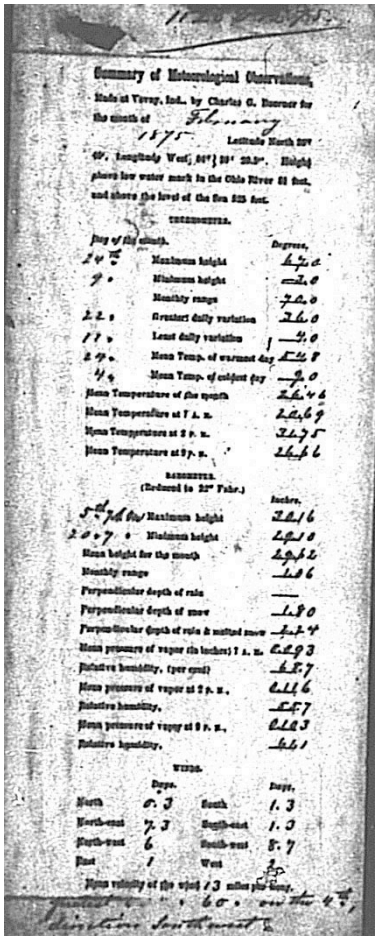
Received 1st Oct 1864 Chas. G. Boerner
Sent in letter No 22293

Figure 4. Charles G. Boerner's first weather report from Vevay, Indiana, August 1864
Source: Original Record, National Climatic Data Center

On 16 October 1864, he began reporting to the Smithsonian Institute using their form. These observations included three: times per day temperature; beginning and ending times of rain or snow, daily amount of rain, and depth of snow; three times per day cloud amounts, cloud types, velocity and direction of movement; and three times per day wind direction and force. Thus began his long and continual meteorological work in Vevay.

In February and March 1869, a small hand drawn form was included in his report to the Smithsonian Institute. The form contained daily barometer readings. He was using an aneroid barometer. In April 1869, he began using a newer Smithsonian Institute form that included barometric pressure and psychrometric readings.

In February 1875, Mr. Boerner added another form with his Smithsonian submission. It was a form that he had printed and it provided for summarized monthly data. The addition of that from was not unique. Smithsonian observers were encouraged to report on a variety of topics.



Summary of Meteorological Observations,

Made at Vevay, Ind., by Charles G. Boerner for the month of February 1875. Latitude North 38° 40'. Longitude West, 84° 30' 20.5". Height above low water mark in the Ohio River 81 feet, and above the level of the sea 525 feet.

THERMOMETER.

Day of the month.		Degrees.
24th	Maximum height	67.0
9	Minimum height	3.0
	Monthly range	70.0
22	Greatest daily variation	36.0
11	Least daily variation	4.0
24	Mean Temp. of warmest day	54.8
4	Mean Temp. of coldest day	9.0
	Mean Temperature of the month	26.46
	Mean Temperature at 7 A. M.	20.69
	Mean Temperature at 2 P. M.	31.75
	Mean Temperature at 9 P. M.	26.66

BAROMETER.
(Reduced to 32° Fahr.)

		Inches.
5th 7th 8th	Maximum height	30.16
20 7	Minimum height	29.10
	Mean height for the month	29.62
	Monthly range	1.06
	Perpendicular depth of rain	—
	Perpendicular depth of snow	1.80
	Perpendicular depth of rain & melted snow	2.24
	Mean pressure of vapor (in inches) 7 A. M.	0.093
	Relative humidity, (per cent)	68.7
	Mean pressure of vapor at 2 P. M.	0.116
	Relative humidity,	55.7
	Mean pressure of vapor at 9 P. M.	0.103
	Relative humidity,	61.1

WINDS.

	Days.		Days.
North	0.3	South	1.3
North-east	7.3	South-east	1.3
North-west	6	South-west	8.7
East	1	West	2

Mean velocity of the wind 13 miles per hour.

Greatest [illegible] 60 on the 4th, direction South-west.

Figure 5. Summary of Meteorological Conditions, Vevay, Indiana, February, 1875
Source: Original Record, National Climatic Data Center

An example of the quantity and quality of his observations can be seen in his October 1875 report. Figure 6 is the right half of the front side of that report made for the U.S. Signal Service.

It shows the last fifteen days of the month. The left half that is not shown contains the first sixteen days of data, identical in format as this side. Note the quantity of entries. Being a cooperative observer was no small undertaking. It required dedication and considerable self discipline to maintain such a record.

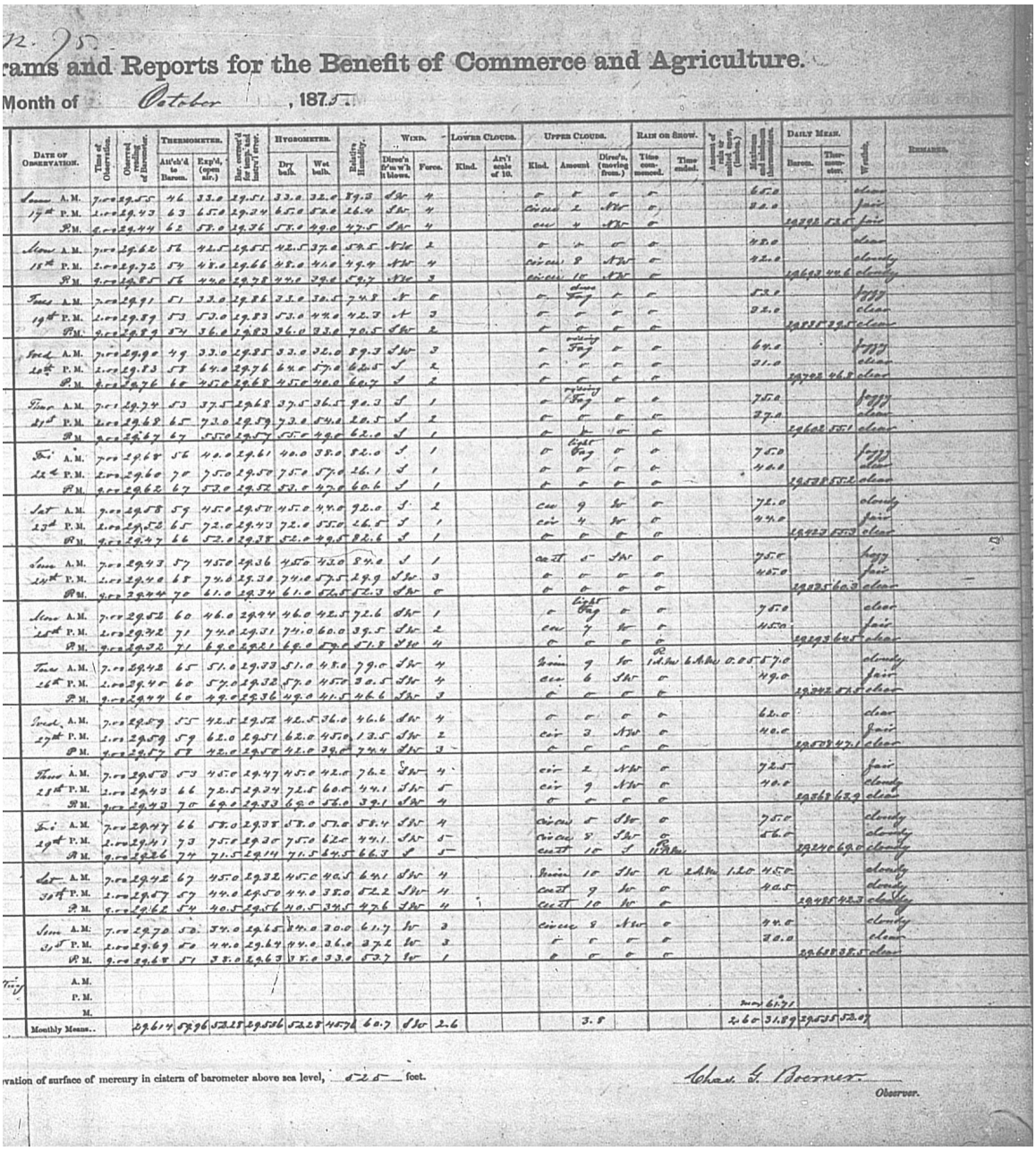


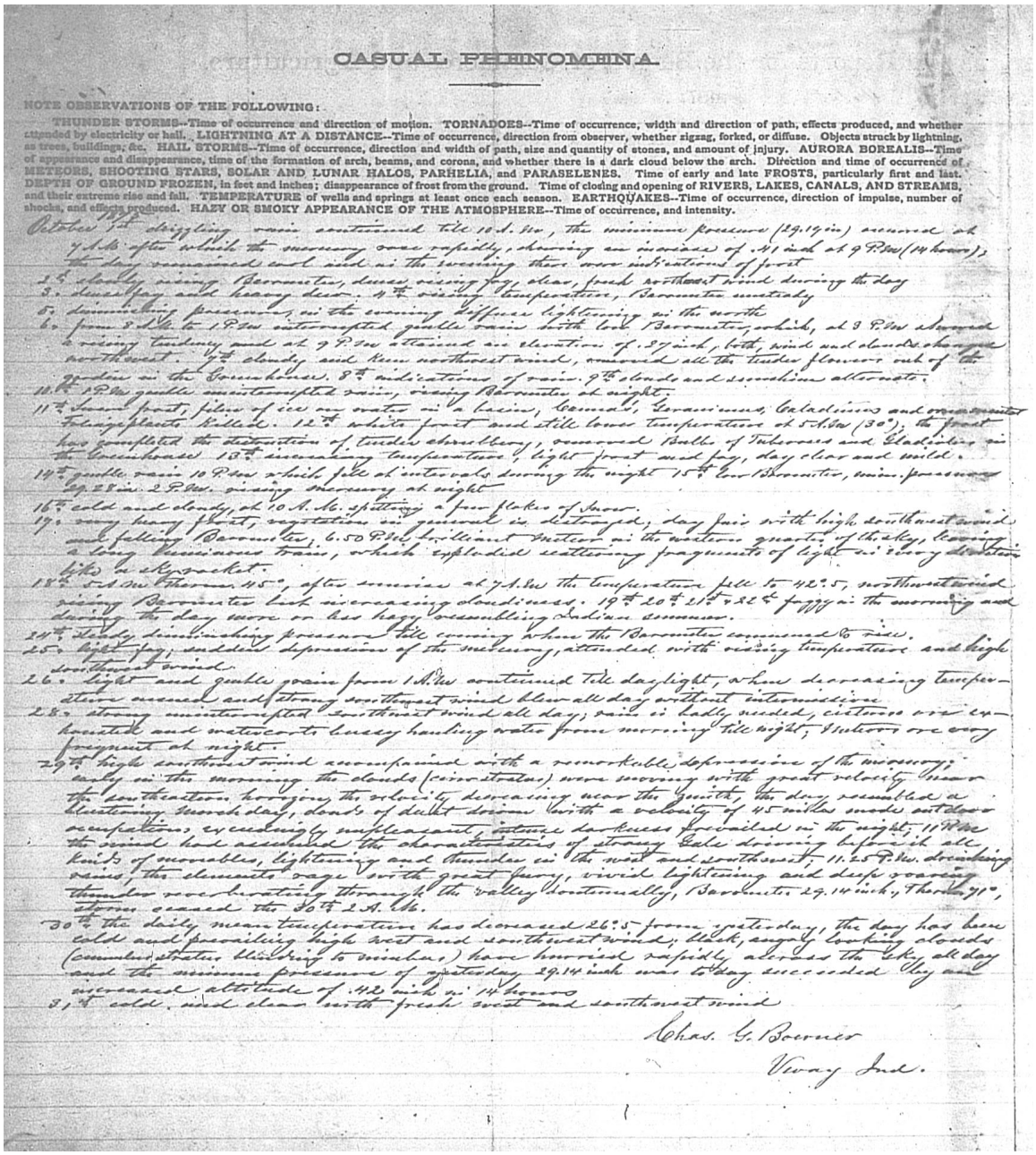
Figure 6. Right half of the Vevay report for October 1875.
Source: Original Record, National Climatic Data Center

The observations were made three times per day at 7 a.m., 2 p.m., and 9 p.m. Each observation recorded the barometer observed, corrected for temperature, and corrected for elevation; the thermometer attached to the barometer, exposed in open air, the maximum and minimum for the day and the daily mean; the hygrometer dry

bulb temperature, the wet bulb temperature, and the relative humidity; the wind direction, the wind force, but did not have velocity measurement; the lower clouds kind, amount in tenths, and direction of movement; the upper clouds kind, amount in tenths, and direction of movement; the beginning time of rain or snow, the ending time of rain or snow, and the amount of rain or snow in inches and hundredths; and the weather (fair, cloudy, etc.).

On the back of the Signal Service form was a large space for reporting "Casual Phenomena." In this regard, the new form was identical to the Smithsonian Form. The instructions were to include thunderstorms, tornadoes, lightning at a distance, hail storms, aurora borealis, meteors, shooting stars, solar halos, lunar halos, parhelia, paraselenes, frosts, depth of ground frozen, opening and closing of the river, temperature of wells and springs, earthquakes, hazy or smoky conditions, gales or hurricanes, unusually heavy rains, and remarkable changes in temperature. Some of these items are no longer considered to be weather phenomena but in his day the refinement of the definition of what constituted weather was still being developed.

Like most of his contemporary observers, Mr. Boerner took the responsibility for reporting these phenomena seriously. As a result, he wrote about these each of these phenomena at one time or another. He also made many comments each month to qualitatively describe the quantitative report on the other side of the form. Typically, his comments filled most or all of the space provided. Figure 7 is an example of the variety and quantity of his comment for one month, October 1875. Note that few days for the month were without comment. These comments form a vital part of the climatological record contributing understanding to both the weather events and to the life and times of the era in which the observations were made.



CASUAL PHENOMENA.

NOTE OBSERVATIONS OF THE FOLLOWING:

THUNDER STORMS--Time of occurrence and direction of motion. TORNADOES--Time of occurrence, width and direction of path, effects produced, and whether attended by electricity or hail. LIGHTNING AT A DISTANCE--Time of occurrence, direction from observer, whether zigzag, forked, or diffuse. Objects struck by lightning, as trees, buildings, &c. HAIL STORMS--Time of occurrence, direction and width of path, size and quantity of stones, and amount of injury. AURORA BOREALIS--Time of appearance and disappearance, time of the formation of arch, beams, and corona, and whether there is a dark cloud below the arch. Direction and time of occurrence of METEORS, SHOOTING STARS, SOLAR AND LUNAR HALOS, PARHELIA, and PARASELENES. Time of early and late FROSTS, particularly first and last. DEPTH OF GROUND FROZEN, in feet and inches; disappearance of frost from the ground. Time of closing and opening of RIVERS, LAKES, CANALS, AND STREAMS, and their extreme rise and fall. TEMPERATURE of wells and springs at least once each season. EARTHQUAKES--Time of occurrence, direction of impulse, number of shocks, and effects produced. HAZY OR SMOKY APPEARANCE OF THE ATMOSPHERE--Time of occurrence, and intensity.

October 1st drizzling rain continued till 10 A.M., the minimum pressure (29.19 in) occurred at 7 A.M. after which the mercury rose rapidly, showing an increase of .41 inch at 9 P.M. (14 hours); the day remained cool and in the evening there were indications of frost

2d slowly rising Barometer, dense rising fog, clear, fresh northwest wind during the day

3. dense fog and heavy dew. 4th rising temperature, Barometer unsteady

5. diminishing pressure, in the evening diffuse lightening in the north

6. from 8 A.M. to 1 P.M. interrupted gentle rain with low Barometer, which, at 3 P.M. showed a rising tendency and at 9 P.M. attained an elevation of .27 inch, both, wind and clouds changed northwest. 7th cloudy and keen northwest wind, removed all the tender flowers out of the garden in the Greenhouse. 8th indications of rain. 9th clouds and sunshine alternate.

10th 1 P.M. gentle uninterrupted rain, rising Barometer at night.

11th Severe frost, film of ice on water in a basin, Cannas, Geraniums, Caladiums and ornamental Foliage plants killed. 12th white frost and still lower temperature at 5 A.M. (30°); the frost has completed the destruction of tender shrubbery, removed Bulbs of Tuberoses and Gladiolus in the Greenhouse 13th increasing temperature, light frost and fog, day clear and mild.

14th gentle rain 10 P.M. which fell at intervals during the night 15th low Barometer, min. pressure 29.28 in. 2 P.M. rising mercury at night

16th cold and cloudy, at 10 A.M. spitting a few flakes of snow.

17. very heavy frost, vegetation in general is destroyed; day fair with high southwest wind and falling Barometer; 6.50 P.M. brilliant meteor in the western quarter of the sky, leaving a long luminous train, which exploded scattering fragments of light in every direction like a skyrocket.

18th 5 A.M. Therm. 45°, after sunrise at 7 A.M. the temperature fell to 42°.5, northwest wind rising Barometer but increasing cloudiness. 19th 20th 21st & 22d foggy in the morning and during the day more or less hazy resembling Indian summer.

24th steady diminishing pressure till evening when the Barometer commenced to rise.

25. light fog, sudden depression of the mercury, attended with rising temperature and high southwest wind.

26. light and gentle rain from 1 A.M. continued till daylight, when decreasing temperature ensued and strong southwest wind blew all day without intermission

28. strong uninterrupted southwest wind all day; rain is badly needed, cisterns are exhausted and watercarts busy hauling water from morning till night; Meteors are very frequent at night.

29th high southwest wind accompanied with a remarkable depression of the mercury; early in the morning the clouds (cirro stratus) were moving with great velocity near the southeastern horizon, the velocity decreasing near the zenith, the day resembled a blustering March day, clouds of dust drawn with a velocity of 45 miles made outdoor occupations exceedingly unpleasant, intense darkness prevailed in the night; 11 P.M. the wind had assumed the characteristics of strong Gale driving before it all kinds of moveables, lightening and thunder in the west and southwest; 11.25 P.M. drenching rains, the elements rage with great fury, vivid lightening and deep roaring thunder reverberating through the valley continually, Barometer 29.14 inch, Therm. 71°, storm ceased the 30th 2 A.M.

30th the daily mean temperature has decreased 26°.5 from yesterday, the day has been cold and prevailing high west and southwest wind; black, angry looking clouds (cumulus stratus blending to nimbus) have hurried rapidly across the sky all day and the minimum pressure of yesterday 29.14 inch was to day succeeded by an increased altitude of .42 inch in 14 hours

31st cold, and clear with fresh west and southwest wind

Chas. G. Boerner

Vevay Ind.

Figure 7. Back side of the Vevay report for October 1875
Source: Original Record, National Climatic Data Center

INSTRUMENTATION

The knowledge of what equipment was used to make these observations is vital to establishing the degree of confidence in the data that were collected. The new form used by the Signal Service recognized that and included a section for describing those instruments. In March 1875, there was a conversion from being a Smithsonian Institute observer to being a U.S. Army Signal Service Observer. In his April 1876, he identified his equipment on the new Signal Service Form E, Meteorological. He recorded these instruments in use for that month as:

Barometer, James Green, # 1687
Rain Gage, Standard Smithsonian 2 inch diameter
Thermometer Exposed, J. Green # 2768
Thermometer Maximum, James Foster
Thermometer, James Green, # 4023
Hygrometer, James Green # 2761A and 2671B

Mr. Boerner sold meteorological instruments as well as used them. In 1883 in a book by S. S. Bassler is a depiction of a rain gage.

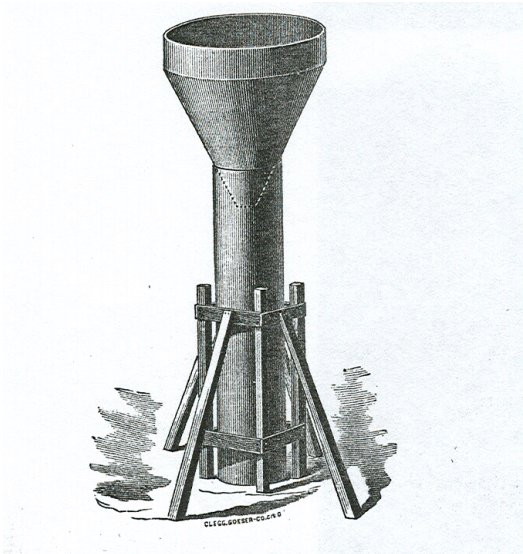


Figure 8. An 1883 Rain Gage
Source: The Weather, A Practical Guide, Bassler, 1883

On page 15-16 of Bassler's book is this footnote that identifies the purveyor of such instruments.

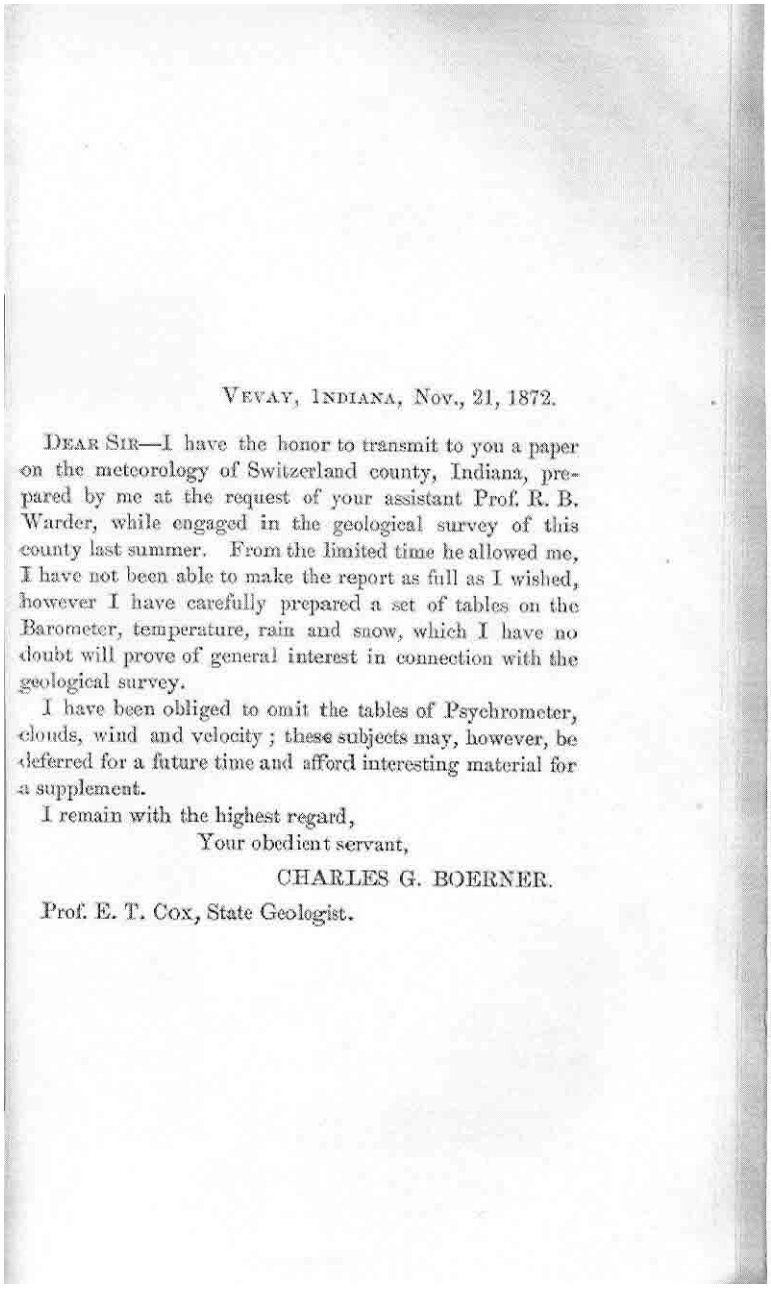
> I take pleasure in recommending to persons desiring to procure reliable instruments at reasonable prices, either Mr. Ferd. Warner,

> 41 West Fifth Street (Fountain Square) Cincinnati, Ohio or Mr. C. G. Boerner, Vevay, Ind. Mr. Wagner has always on hand a complete stock of meteorological instruments, as well as mathematical and optical goods. Mr. Boerner is a long established house of the highest reputation. Correspondence with, or a personal visit to either may be of advantage to the intending purchaser of meteorological instruments.

In 1939, a wind vane and an anemometer had been added.

CHARLES G. BOERNER, THE CLIMATOLOGIST

It is fortunate for us that he published his climatological study of Vevay's climate. In 1872, Mr. Boerner submitted his study to the State Geologist for Indiana. That study contains data that exist nowhere else and his oral history is an important contribution to our understanding. His study follows as Figures 9-21.



VEVAY, INDIANA, Nov., 21, 1872.

DEAR SIR—I have the honor to transmit to you a paper on the meteorology of Switzerland county, Indiana, prepared by me at the request of your assistant Prof. R. B. Warder, while engaged in the geological survey of this county last summer. From the limited time he allowed me, I have not been able to make the report as full as I wished, however I have carefully prepared a set of tables on the Barometer, temperature, rain and snow, which I have no doubt will prove of general interest in connection with the geological survey.

I have been obliged to omit the tables of Psychrometer, clouds, wind and velocity; these subjects may, however, be deferred for a future time and afford interesting material for a supplement.

I remain with the highest regard,

Your obedient servant,

CHARLES G. BOERNER.

Prof. E. T. Cox, State Geologist.

Figure 9. Boerner Study page 1

METEOROLOGY

OF

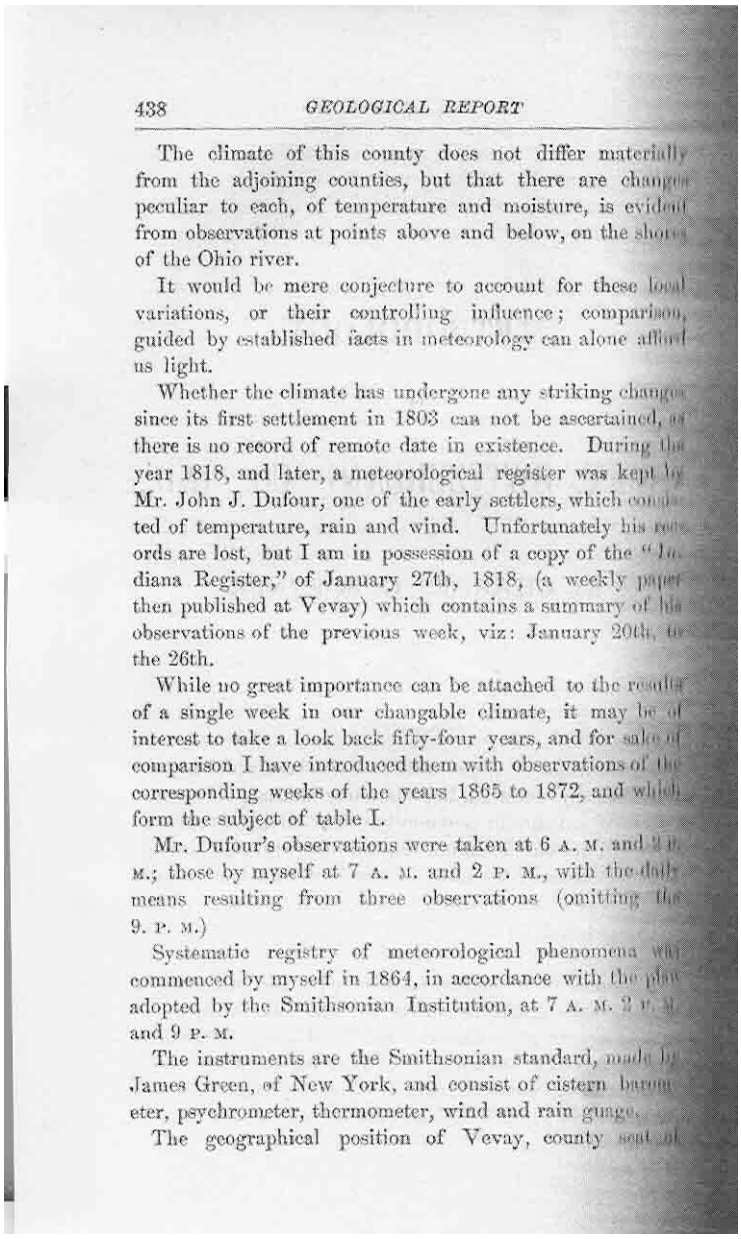
VEVAY, SWITZERLAND CO., IND.,

BY CHARLES G. BOERNER.

A knowledge of the climate and the laws which govern it, is not only essential, but absolutely indispensable to the welfare of a nation or community. The intelligent agriculturist will not only examine into the chemical and geological components of the soil, but also study the temperature, wind and moisture, which, according to circumstances, may be either beneficial or injurious to his productions and health.

It is alone, by becoming familiar with the principles of practical agriculture, chemistry of the soil, geology and meteorology, that the material and intellectual interests of both farmer and mechanic are advanced, the resources of the soil and the mines developed, which, in connection with commerce and manufactures, lay the foundation of a nation's wealth.

Figure 10. Boerner Study page 2



438 GEOLOGICAL REPORT

The climate of this county does not differ materially from the adjoining counties, but that there are changes peculiar to each, of temperature and moisture, is evident from observations at points above and below, on the shores of the Ohio river.

It would be mere conjecture to account for these local variations, or their controlling influence; comparison, guided by established facts in meteorology can alone afford us light.

Whether the climate has undergone any striking changes since its first settlement in 1803 can not be ascertained, as there is no record of remote date in existence. During the year 1818, and later, a meteorological register was kept by Mr. John J. Dufour, one of the early settlers, which consisted of temperature, rain and wind. Unfortunately his records are lost, but I am in possession of a copy of the "Indiana Register," of January 27th, 1818, (a weekly paper then published at Vevay) which contains a summary of his observations of the previous week, viz: January 20th, to the 26th.

While no great importance can be attached to the results of a single week in our changable climate, it may be of interest to take a look back fifty-four years, and for sake of comparison I have introduced them with observations of the corresponding weeks of the years 1865 to 1872, and which form the subject of table I.

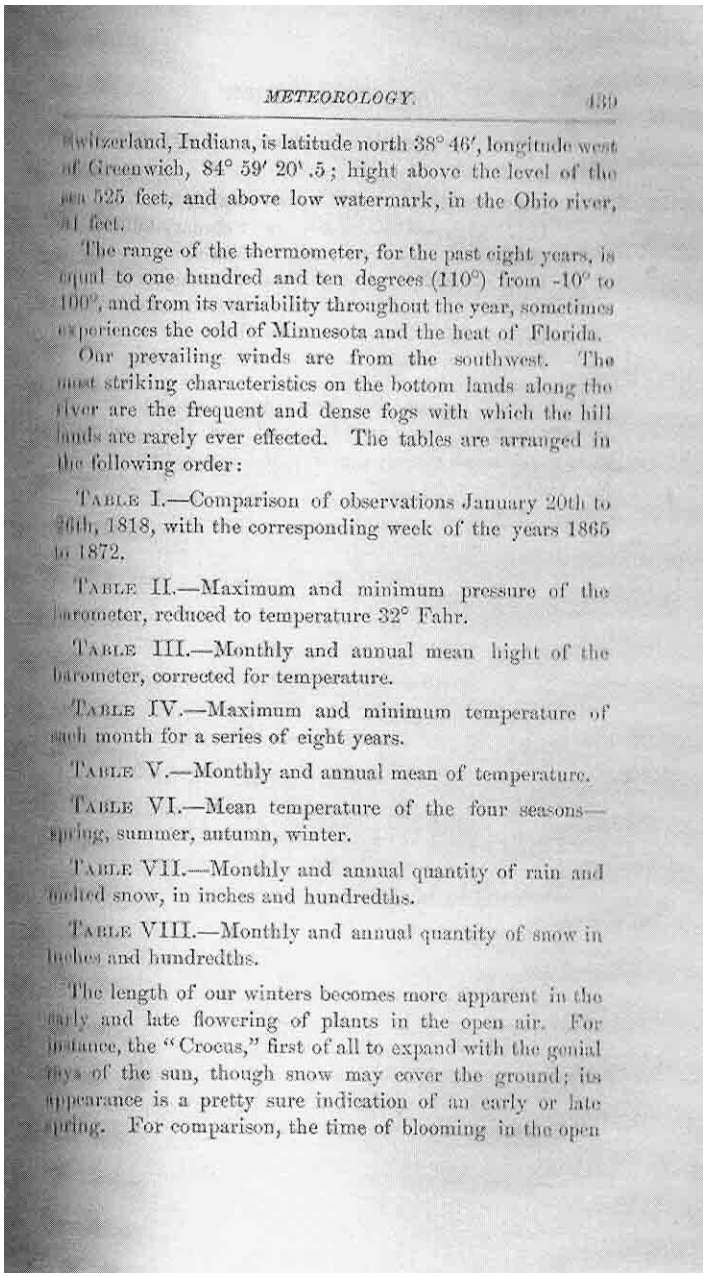
Mr. Dufour's observations were taken at 6 A. M. and 2 P. M.; those by myself at 7 A. M. and 2 P. M., with the daily means resulting from three observations (omitting the 9. P. M.)

Systematic registry of meteorological phenomena was commenced by myself in 1864, in accordance with the plan adopted by the Smithsonian Institution, at 7 A. M. 2 P. M. and 9 P. M.

The instruments are the Smithsonian standard, made by James Green, of New York, and consist of cistern barometer, psychrometer, thermometer, wind and rain guage.

The geographical position of Vevay, county seat of

Figure 11. Boerner Study page 3



Switzerland, Indiana, is latitude north 38° 46′, longitude west of Greenwich, 84° 59′ 20′.5; hight above the level of the sea 525 feet, and above low watermark, in the Ohio river, 51 feet.

The range of the thermometer, for the past eight years, is equal to one hundred and ten degrees (110°) from -10° to 100°, and from its variability throughout the year, sometimes experiences the cold of Minnesota and the heat of Florida.

Our prevailing winds are from the southwest. The most striking characteristics on the bottom lands along the river are the frequent and dense fogs with which the hill lands are rarely ever effected. The tables are arranged in the following order:

TABLE I.—Comparison of observations January 20th to 26th, 1818, with the corresponding week of the years 1865 to 1872.

TABLE II.—Maximum and minimum pressure of the barometer, reduced to temperature 32° Fahr.

TABLE III.—Monthly and annual mean hight of the barometer, corrected for temperature.

TABLE IV.—Maximum and minimum temperature of each month for a series of eight years.

TABLE V.—Monthly and annual mean of temperature.

TABLE VI.—Mean temperature of the four seasons—spring, summer, autumn, winter.

TABLE VII.—Monthly and annual quantity of rain and melted snow, in inches and hundredths.

TABLE VIII.—Monthly and annual quantity of snow in inches and hundredths.

The length of our winters becomes more apparent in the early and late flowering of plants in the open air. For instance, the "Crocus," first of all to expand with the genial rays of the sun, though snow may cover the ground; its appearance is a pretty sure indication of an early or late spring. For comparison, the time of blooming in the open

Figure 12. Boerner Study page 4

air, in the same location, is here given for a period of seven years:

1866 - - - -	March 5th.
1867 - - - - -	February 26th.
1868 - - - -	March 6th.
1869 - - - - -	February 20th.
1870 - - - -	March 19th.
1871 - - - - -	February 25th.
1872 - - - -	March 18th.

Thus it will be seen that the earliest blooming occurred in 1869, and the latest in 1870; and that 1870 and 1872 show a difference of only one day, the two extremes about four weeks.

Figure 13. Boerner Study page 5

TABLE I.

Comparison of Thermometer, January, 1818 *and* 1865 *to* 1872.

	1818.				1865.				1866.				1867.				1868.			
January.	6 A. M.	2 P. M.	Mean.		7 A. M.	2 P. M.	Mean.	Mean of 3 obs.	7 A. M.	2 P. M.	Mean.	Mean of 3 obs.	7 A. M.	2 P. M.	Mean.	Mean of 3 obs.	7 A. M.	2 P. M.	Mean.	Mean of 3 obs.
	°	°	°		°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°
20	12.	45.	44.0		20.	36.	28.0	28.3	15.	20.	17.5	15.0	22.	28.	25.0	25.5	33.	37.	35.0	34.3
21	44.	55.	49.5		26.	40.	38.0	37.3	8.	25.	14.5	17.6	22.	24.	23.0	22.6	37.	38.	37.5	35.3
22	40.	50.	45.0		36.	40.	38.0	36.0	25.	36.	30.5	30.3	21.	31.	24.0	24.0	32.	42.	37.0	34.6
23	30.	40.	35.0		29.	27.	27.5	25.0	30.	36.	33.0	32.6	22.	28.	25.0	23.0	40.	47.	43.5	41.8
24	40.	55.	47.5		16.	22.	19.0	16.0	34.	26.	35.0	34.8	24.	26.	25.0	26.0	22.	30.	27.5	23.6
25	30.	44.	37.0		5.	22.	13.5	15.0	32.	35.	33.5	33.0	30.	48.	39.0	33.0	15.	45.	30.0	32.0
26	44.	62.	43.0		10.	20.	15.0	13.3	31.	40.	35.5	34.3	22.	26.	24.0	22.6	38.	47.	42.5	41.8
Mean	38.6	47.4	43.0		21.6	29.6	25.6	24.5	25.0	32.6	28.5	28.2	23.3	30.1	26.4	25.5	29.6	40.9	35.4	34.7

TABLE I.—Continued.

	1869.				1870.				1871.				1872.			
	7 A. M.	2 P. M.	Mean.	Mean of 3 obs.	7 A. M.	2 P. M.	Mean.	Mean of 3 obs.	7 A. M.	2 P. M.	Mean.	Mean of 3 obs.	7 A. M.	2 P. M.	Mean.	Mean of 3 obs.
	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°
January 20	33.	45.	39.0	36.0	25.	46.	35.5	35.0	30.	44.	37.0	38.3	30.	45.	35.5	34.3
January 21	27.	45.	34.0	36.7	27.	43.	35.0	34.2	31.	49.	40.0	42.2	28.	30.	29.0	28.3
January 22	34.	43.	38.5	32.0	33.	56.	44.5	48.0	28.	35.	31.5	31.5	29.	43.	34.0	35.7
January 23	24.	45.	34.5	33.5	52.	43.	47.5	45.3	30.	46.	38.0	36.5	30.	33.	36.5	34.7
January 24	31.	54.	42.5	42.3	35.	33.	34.0	33.7	30.	36.	33.0	31.7	10.	19.	15.5	14.7
January 25	31.	31.	31.0	28.3	33.	44.	38.5	39.3	28.	30.	29.0	29.8	10.	22.	16.0	16.0
January 26	15.	40.	27.5	26.0	32.	58.	45.0	44.3	30.	27.	28.5	27.5	18.	29.	23.5	25.0
Mean	27.9	40.3	35.3	33.5	33.0	46.1	40.0	35.7	29.6	36.7	33.9	33.6	21.0	33.7	25.7	25.7

Figure 14. Boerner Study page 6

TABLE No. II.

Barometer Reduced to 32° Fahrenheit.

YEAR.	January.		February.		March.		April.		May.		June.		July.		August.		Septemb'r.		October.		November.		December.	
	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.
	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.
1867	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	29.87	29.20	29.97	29.15	29.87	29.15
1868	30.10	29.15	30.11	29.32	29.88	28.75	29.75	28.93	29.60	28.90	29.60	29.15	29.45	29.03	29.52	29.10	29.65	29.15	29.85	29.15	29.75	29.17	29.85	29.05
1869	29.67	29.10	29.73	28.89	29.82	29.07	29.87	28.88	29.72	29.03	29.89	29.18	29.84	29.46	29.87	29.50	29.69	29.42	30.03	29.26	29.94	28.77	30.09	29.15
1870	30.05	28.92	29.88	28.73	29.96	28.51	29.76	29.14	29.68	28.90	29.74	29.13	29.66	29.21	29.74	29.31	29.74	29.28	29.90	28.35	29.95	29.16	30.08	28.88
1871	29.96	29.15	29.97	28.74	29.79	29.05	29.93	29.01	29.69	29.16	29.63	29.16	29.71	29.22	29.68	29.19	30.01	29.39	29.88	29.27	29.93	28.85	30.09	29.07
1872	29.96	29.04	30.05	29.01	30.00	28.82	29.85	28.98	29.82	28.88	29.68	29.19	29.63	29.25	29.77	29.32	29.80	29.03	29.84	29.24	.....	.....	.....	.....
Mean	29.96	29.09	29.95	28.92	29.89	28.84	29.79	28.98	29.70	28.99	29.31	29.16	29.56	29.25	29.72	29.28	29.77	29.25	29.90	29.17	29.91	29.02	29.99	29.06

Figure 15. Boerner Study page 7

TABLE No. III.

Mean Elevation of the Barometer.

YEAR.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual Mean.
	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.
1867	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	29.58	29.57	29.575
1868	29.29	29.66	29.49	29.46	29.30	29.38	29.24	29.33	29.33	29.48	29.43	29.48	29.406
1869	29.41	29.35	29.41	29.31	29.39	29.62	29.61	29.67	29.74	29.61	29.55	29.66	29.528
1870	29.54	29.43	29.46	29.47	29.49	29.45	29.47	29.48	29.54	29.55	29.55	29.56	29.494
1871	29.63	29.49	29.42	29.35	29.46	29.43	29.47	29.44	29.60	29.58	29.52	29.62	29.501
1872	29.59	29.46	29.53	29.50	29.48	29.48	29.47	29.52	29.50	29.61	.....	.....	29.514
Mean	29.49	29.48	29.48	29.42	29.41	29.47	29.45	29.49	29.54	29.57	29.55	29.58	29.493

Figure 16. Boerner Study page 8

TABLE No. IV.

Maximum and Minimum Temperature of each Month during a series of Eight Years.

YEAR.	January.		February.		March.		April.		May.		June.		July.		August.		September.		October.		November.		December.	
	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.
	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°
1865	45.0	—2.0	63.0	14.0	78.5	16.0	82.0	34.0	89.0	42.0	95.0	63.0	100.0	60.0	95.0	58.0	95.0	51.0	96.0	37.0	78.0	24.0	76.0	6.0
1866	68.0	84.0	70.0	—7.0	76.0	18.0	97.0	33.0	98.0	46.0	99.0	50.0	100.0	67.0	96.0	30.0	90.0	50.0	82.0	32.0	64.0	27.0	69.0	5.0
1867	57.0	0.0	62.0	—10.0	61.0	11.0	83.0	31.0	95.0	35.0	90.0	66.0	100.0	68.0	98.0	52.0	97.0	42.0	90.0	28.0	77.0	10.0	72.0	11.0
1868	60.0	0.0	61.0	+5.0	82.0	10.0	85.0	23.0	95.0	30.0	95.0	60.0	90.0	72.0	90.0	58.0	86.0	44.0	80.0	30.0	68.0	28.0	57.0	—2.0
1869	61.0	13.0	70.0	13.0	71.0	6.0	76.0	30.0	84.0	43.0	90.0	51.0	93.0	60.0	95.0	57.0	88.0	42.0	77.0	21.0	61.0	21.0	51.0	18.0
1870	58.0	5.0	58.0	1.5	62.0	15.5	85.5	31.0	90.0	46.0	94.5	56.0	93.0	60.5	94.0	58.5	90.0	53.0	79.5	39.0	73.5	24.0	61.0	—4.0
1871	65.5	13.5	67.0	20.5	78.0	30.0	82.0	32.0	88.0	44.0	91.5	61.0	97.0	58.0	96.0	56.0	88.0	37.0	84.0	32.0	72.0	13.0	64.0	—7.0
1872	47.0	2.0	58.0	5.0	69.0	10.0	85.5	32.0	85.0	46.5	89.0	50.0	92.0	65.0	96.0	53.5	93.5	45.0	87.0	30.0	.....	.....	.....	.....
Mean	60.31	4.69	63.62	5.25	72.19	14.56	84.50	30.75	90.63	44.06	94.13	57.50	96.75	63.94	95.00	55.38	91.06	45.50	84.44	31.13	70.50	18.38	55.13	2.38

From November to December, the average is for seven years.

TABLE No. V.

Monthly and Annual Means of Temperature.

YEAR.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual Mean.
	°	°	°	°	°	°	°	°	°	°	°	°	
1865	25.8	37.4	48.7	56.4	64.4	77.6	77.8	74.8	77.2	55.0	44.1	30.7	56.32
1866	32.3	33.6	42.1	61.8	64.4	77.8	84.7	75.9	68.9	58.9	45.3	31.9	56.46
1867	24.7	41.7	38.6	55.7	61.4	79.6	80.3	80.2	74.0	57.9	47.0	34.9	56.33
1868	29.2	33.7	50.3	53.1	67.6	76.9	84.8	76.3	65.8	54.9	44.1	30.1	55.56
1869	31.1	38.0	37.9	51.3	61.2	69.9	75.8	76.6	66.6	46.5	39.6	35.7	52.52
1870	34.7	34.4	39.1	55.4	66.8	72.8	77.9	75.4	71.4	58.1	44.9	32.1	55.25
1871	25.5	37.7	50.3	58.8	66.0	74.9	75.2	77.4	64.8	57.5	42.1	30.5	55.89
1872	28.9	33.2	37.1	57.4	66.8	72.5	77.2	76.2	68.0	54.3	.....	.....	.....
Mean	30.27	36.21	43.01	55.24	64.82	75.25	79.21	76.60	69.59	55.39	43.87	33.13	55.68

Figure 17. Boerner Study page 9

Figure 18. Broerner Study page 10

TABLE No. VI.

Mean Temperature of the Four Seasons.

YEAR.	SPRING.	SUMMER.	AUTUMN.	WINTER.
1865	66.13	76.60	45.27	37.30
1866	68.00	76.50	45.37	36.00
1867	65.57	78.17	46.00	35.00
1868	65.87	75.63	43.03	37.73
1869	60.80	73.00	40.00	35.67
1870	65.00	74.90	45.03	36.07
1871	66.57	72.47	43.37	41.17
1872	65.57	73.80	.....	33.07
Mean	65.44	75.19	44.18	36.50

Figure 19. Boerner Study page 11

TABLE No. VII.

Monthly and Annual quantity of Rain and Melted Snow in Inches and Hundredths.

YEAR.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual Amount.
1865	4.70	0.62	2.70	5.73	11.80	2.45	4.70	1.98	6.51	1.55	1.25	6.70	50.69
1866	3.95	1.84	5.72	1.69	1.50	5.28	6.95	1.47	15.25	1.48	4.22	3.09	52.44
1867	6.18	7.34	5.52	1.76	4.25	3.29	3.95	4.09	0.77	1.64	3.50	6.40	48.54
1868	6.20	0.90	5.40	3.65	5.93	4.95	1.17	4.29	6.72	1.30	1.72	2.82	45.05
1869	1.87	4.05	5.40	3.94	6.95	4.54	0.90	2.10	3.05	2.97	4.74	3.47	42.98
1870	7.18	2.47	3.93	2.37	2.37	3.80	3.20	2.55	1.20	2.43	1.50	2.13	35.13
1871	2.52	4.39	4.74	2.77	3.16	2.30	3.82	4.06	0.47	1.00	3.07	3.75	36.05
1872	0.75	2.22	1.04	7.18	4.15	6.67	5.16	3.55	3.17	4.05	.....	.....	37.94
Mean	4.17	2.98	4.31	3.65	4.89	4.15	3.73	3.01	4.64	2.05	2.86	4.05	43.60

Figure 20. Boerner Study page 12

TABLE No. VIII.

Monthly and Annual Quantity of Snow in Inches and Hundredths.

YEAR.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual amount.
1865	31.00	2.10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	33.10
1866	1.10	0.10	.....	2.00	.....	.....	.....	.....	.....	.....	.....	1.88	5.13
1867	19.20	11.75	9.00	.....	.....	.....	.....	.....	.....	.....	.....	20.25	59.95
1868	9.00	1.00	0.50	3.00	.....	.....	.....	.....	.....	.....	0.05	2.35	15.90
1869	2.00	1.30	0.90	0.10	.....	.....	.....	.....	.....	2.00	3.35	6.75	16.40
1870	5.35	7.75	1.75	.....	.....	.....	.....	.....	.....	.....	8.00	.....	22.85
1871	5.90	0.25	.....	.....	.....	.....	.....	.....	.....	.....	0.15	5.60	11.90
1872	4.95	9.00	0.20	.....	.....	.....	.....	.....	.....	.....	.....	.....	14.15
Mean	9.81	4.16	1.54	0.64	.....	.....	.....	.....	.....	0.25	1.44	4.60	12.92

Figure 21. Boerner Study page 13

VEVAY, THE HISTORICAL CLIMATE NETWORK STATION

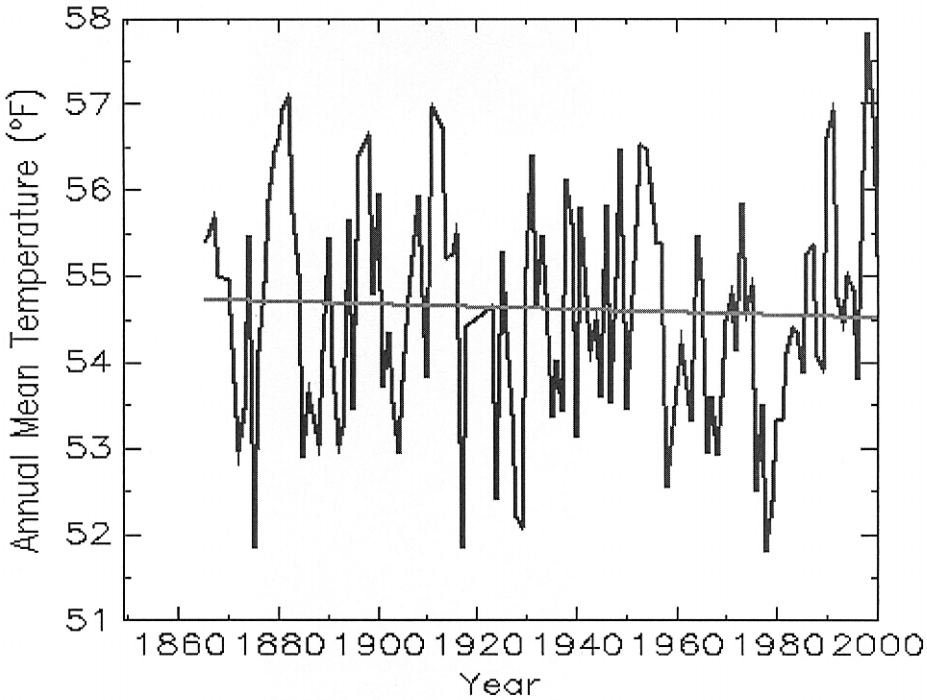


Figure 22. Vevay, Indiana Mean Annual Temperature 1864-2000
Source: Center for the Study of Carbon Dioxide and Global Change

The National Climatic Data Center developed the United States Historical Climate Network to serve as the benchmark for future climate studies. It is a high-quality data set of monthly averaged maximum, minimum, and mean temperature and total monthly precipitation. Vevay, Indiana was selected to be part of the network comprised of 1221 high-quality stations from the U.S. Cooperative Observing Network within the 48 contiguous United States. Vevay joined other stations were chosen based on a number of criteria including length of period of record (generally the period 1900-1995), percent missing data, number of station moves and other station changes that may affect the data homogeneity, and spatial coverage. The period of record at Vevay is longer than most of those stations. Its data, and those of the other USHCN stations, are used by climatologists to analyze long-term variability of climate. A graph of one such study is shown at Figure 21. Many USHCN stations require an urban warming correction based on population growth to be applied. Vevay has an advantage in that regard because of its minimal urbanization.

Included with the USHCN data set are metadata files that contain station history information about station moves, instrumentation, observing times, and elevation.

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APPENDIX 1

METHODOLOGY

The primary sources of information for this study were the Vevay observers' daily weather records themselves. Copies of their monthly reports and the data digitized from those reports were available from the Midwestern Regional Climate Center in Champaign, Illinois, or the National Climatic Data Center in Asheville, North Carolina. The monthly reports can be considered original sources because they were written by the observers and not altered by subsequent readers.

There were a variety of secondary sources that held information about Vevay, its history, and its people. The author visited and collected information from the holdings of the Kentucky Climate Center and the Kentucky Library at Western Kentucky University in Bowling Green, Kentucky; the National Climatic Data Center at Asheville, North Carolina; the Public Library and the Switzerland County Historical Society in Vevay, Indiana; the Indiana State Archives and the Indianapolis Public Library in Indianapolis, Indiana; the Filson Historical Society in Louisville, Kentucky; the Cincinnati Public Library in Cincinnati, Ohio; and the LDS Family History Library in Salt Lake City, Utah. In addition, the State Climatologist for Indiana, Kenneth L. Scheeringa at Purdue University was particularly helpful in identifying historical documents of note.

The tertiary sources were reference materials that are available on-line. Among those were the metadata summaries prepared by the Midwestern Regional Climate Center, the National Climatic Data Center substation histories. Two genealogical research sources, Ancestry.com and Genealogy.com were used to provide some of the personal information about the observers. For location analysis, the interactive maps available from TopoZone.com were used.

There was an attempt to glean information from all these sources that would allow a glimpse into the lives of the observers, the location of the observation site, and the historical environment that produced the climatic history of Vevay, Indiana. Maps, drawings, and photographs were included when appropriate to illustrate the information.

Throughout the research for and preparation of this study, the objective 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 the whatever variability may be discerned.