HISTORY OF WEATHER OBSERVATIONS NEWPORT BARRACKS, KENTUCKY 1825-1892

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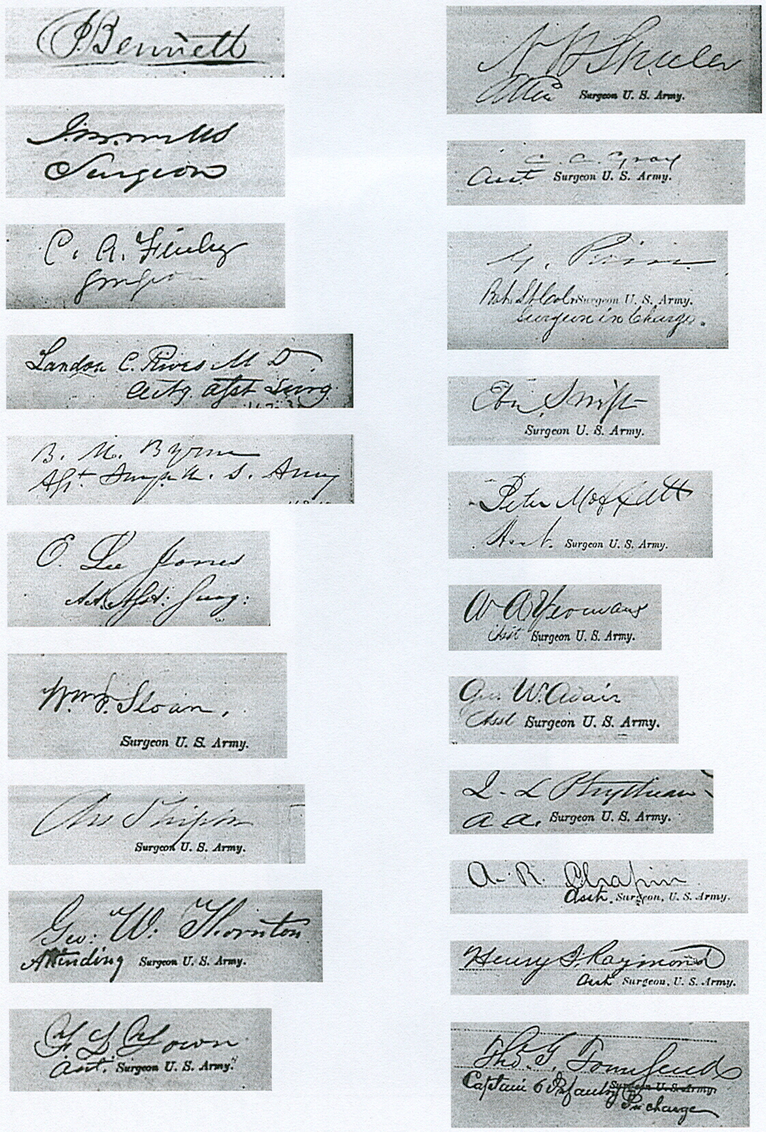
The Newport Barracks Observers



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HISTORY OF WEATHER OBSERVATIONS
NEWPORT BARRACKS, KENTUCKY
1825-1892

Glen Conner
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INTRODUCTION

The Location in Time and Place

In 1804, an U.S. Army Post was constructed at the confluence of the Licking and Ohio Rivers on the upstream Kentucky side. Kentucky had become the fifteenth state just twelve years earlier but it was still mostly sparsely populated. The Post was built to be an arsenal but some artillerymen were arrived there in 1807. During the War of 1812, the Post assumed a role of recruiting center for the area. During the War, it was used to house prisoners of war. After the War, it reverted to its role in recruiting.

Just as in modern times, the Army was reduced in size after the Revolutionary War. It was reduced to only a few companies to guard military stores. Just as in modern times, new conflicts (then in what is now Ohio) evidenced the need for an increase in the Army. As part of that increase, there was an authorization to provide surgeons at regiments or posts. In 1813, civilians were appointed Physician General and Apothecary General to monitor medical activities. In 1818, Congress created the office of the Surgeon General to be filled by a military surgeon.

In 1814 during the War of 1812, the Surgeon-General of the Army was James Tilton M.D. He issued a directive to his Army hospital, post, and regimental surgeons to record the weather. Although this beginning was encouraging it was dropped between 1815 and 1817. The effort to collect climate data was renewed by his successor, Joseph Lovell, M.D. in 1818. He ordered each Army surgeon to ".... keep a diary of the weather...." and to note ".... everything of importance relating to the medical topography of his station, the climate, diseases prevalent in the vicinity...." The emphasis was on subjective observations and, at least in effect, data were collected to supplement the observer's remarks.

The motivation for the new task was to determine if there was a cause and effect relationship between climate and the health of the soldiers. Dr. Lovell said the purpose was to ascertain if "in a series of years there be any material change in the climate of a given district of the country; and if so, how far it depends on cultivation of the soil, density of population, etc." Now, nearly two hundred years later, that could still serve as a mission statement.

The medical doctors in the Army were a logical choice to perform these early observations. If there was a connection between climate and disease, they were most likely to find it. They were trained scientists, schooled in the importance of careful observations and reasoned analysis. They were responsible people who could be trusted in this task just as they were in other medical

tasks. They fulfilled their obligations as evidenced by the fact that the entries of the observations and the signature of the surgeons were in the same handwriting.

The Army was a logical choice of an organization to assume the climatic data collection. It had the ability to direct action and assure compliance. It had the capacity to collect data in a single standardized format so that geographical differences would be assessed. It had the advantage of having a presence even in the most remote areas of the frontier especially in areas that had few or no cities. That was important because some knowledge could be obtained before large numbers of people migrated into the frontier areas.

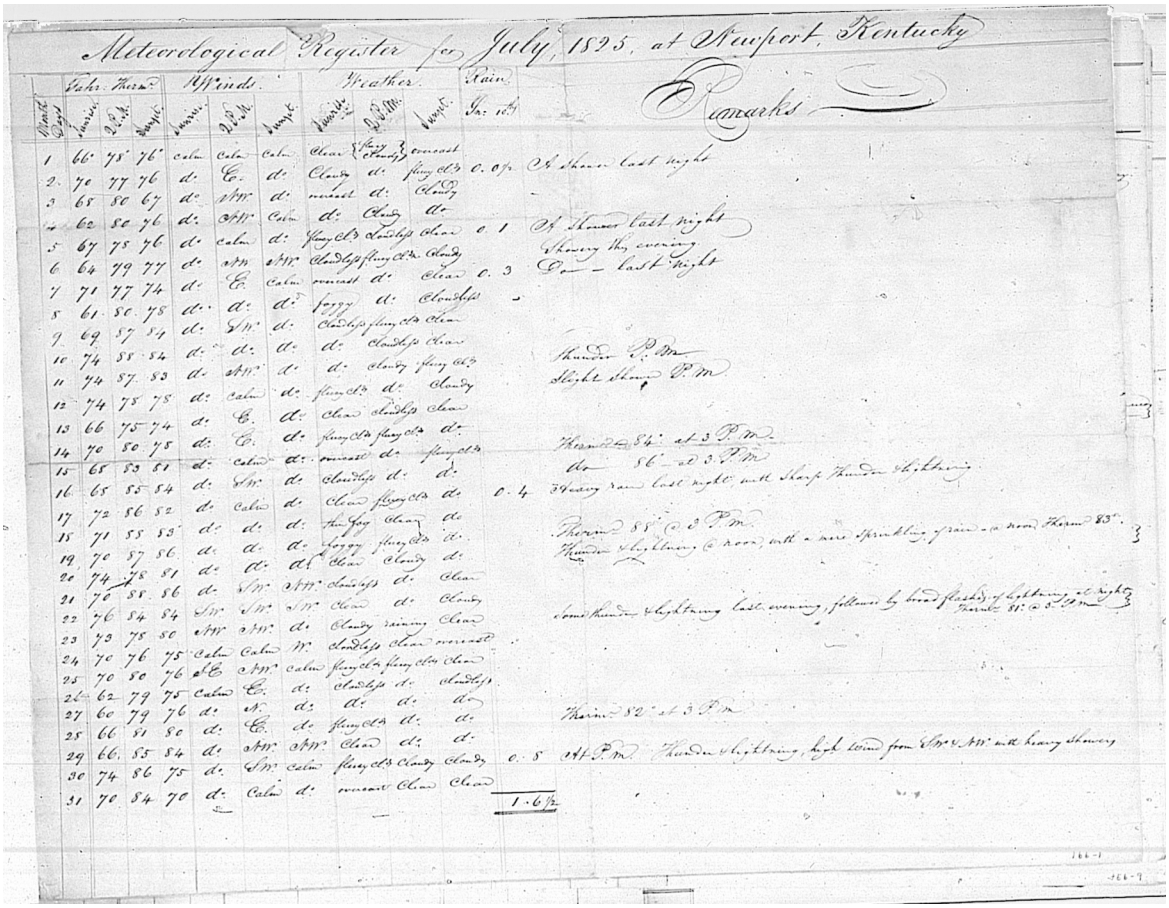

Meteorological Register for July, 1825, at Newport, Kentucky

Figure 1. Meteorological Record for July 1825 at Newport Kentucky. The observations were actually taken at Newport Barracks located in Newport.
Source: Kentucky Climate Center, Western Kentucky University

So it was that the first Citizen Surgeon assigned to Newport Barracks, Kentucky began observing and recording the weather. His report for July 1825 is the earliest official weather observations in the Commonwealth (Figure 1). It was a hand drawn form that recorded the temperature at sunrise, 2:00 p.m., and sunset and the daily precipitation totals in inches and

tenths. Remarks mostly concerned the precipitation events. The Acting Surgeon J. Bennett signed the subsequent reports as the observer. Because the handwriting is the same on this first form as on subsequent forms, it is clear that he made the first observation too.

The Army doctors who made the meteorological observations probably were not trained in meteorology. They no doubt had to divert away from the care of the sick or wounded to make them. Such was the importance of the observations. Yet, they made them faithfully at Newport Barracks and at many other places around the relatively new nation.

This study describes the evolution of weather observations at Newport Barracks in Kentucky near the western edge of the frontier that led the way in understanding Kentucky's climate.

Goal of the Study

The goal of this study is to document the primary weather observational history of Newport Barracks that was part of the path to the current National Weather Service's observing program. Climatic data from the weather observations there throughout the period of record are readily available from the National Climatic Data Center, the Midwestern Regional Climate Center, and the State Climatologist of Kentucky. The challenge of this study was to identify Newport Barracks's role in the development of the formal weather observational program and where it fit in the route that followed 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.

INSTRUMENTATION

Little is known about the weather instruments used at Newport Barracks. Some understanding can be gained from the instructions provided to the physicians who were making the observations.

The following are instructions and information taken from a book published in 1851 entitled, Meteorological Register: Observations Made by the Officers of the Medical Department of the Army at the Military Posts of the United States.

In 1836, rain gauges were furnished to many of the posts, by which the daily falls of rain and snow could be measured and entered upon the tables in inches and the fractions of an inch. The instrument employed is the conical rain gauge of De Witt; and observations are ordered to be made immediately after every shower or fall of rain or snow.

The following instructions were issued by the Department for its observers:

> The instrument used to measure the quantity of rain which falls, is the conical rain gauge. It will be kept remote from all elevated structures at a distance at least equal to their height, and still further off, where it can be conveniently done. It is to be suspended in a circular opening, made in a board, which is to be fixed to a post, eight feet from the ground; the opening to be five inches in diameter, and beveled, so as to fit the side of the gauge, into which the cap is to be fixed, base downwards, to prevent evaporation. The measurement is made by putting down perpendicularly to the bottom of the gauge the measuring stick, and applying it from its point to the water mark, on the scale, which will express the quantity in inches, or their decimals. The graduation of the scale is by hundredths of an inch for the first three-tenths of an inch, and above that by tenths and half tenths. Parts of degrees will be measured by the eye, and set down in decimals. If a rain continue for any length of time, the quantity in the gauge will be measured at suitable intervals, before the water rises high in it, and the measurements summed up at the close.
>
> In freezing weather, when the rain gauge cannot be used out of doors, it will be taken into the room, and a tin vessel will be substituted for receiving the snow, rain, or sleet that may then fall. This vessel must have its opening exactly equal to that of the rain gauge, and widen downwards to a sufficient depth, with a considerable slope. It should be placed where nothing can obstruct the descending snow from entering, and where no drift snow can be blown into it. During a continued snow storm, the snow may be occasionally pressed down. The contents of the vessel must be

melted by placing it near the fire, with a cover to prevent evaporation, and the water produced poured into the gauge to ascertain its quantity, which must then be entered into the Register.

NEWPORT BARRACKS AS AN ARMY POST

The Newport Barracks stood at the confluence of the Licking and Ohio Rivers in Newport, Kentucky as shown in the early hand drawn plant of it (Figure 2).

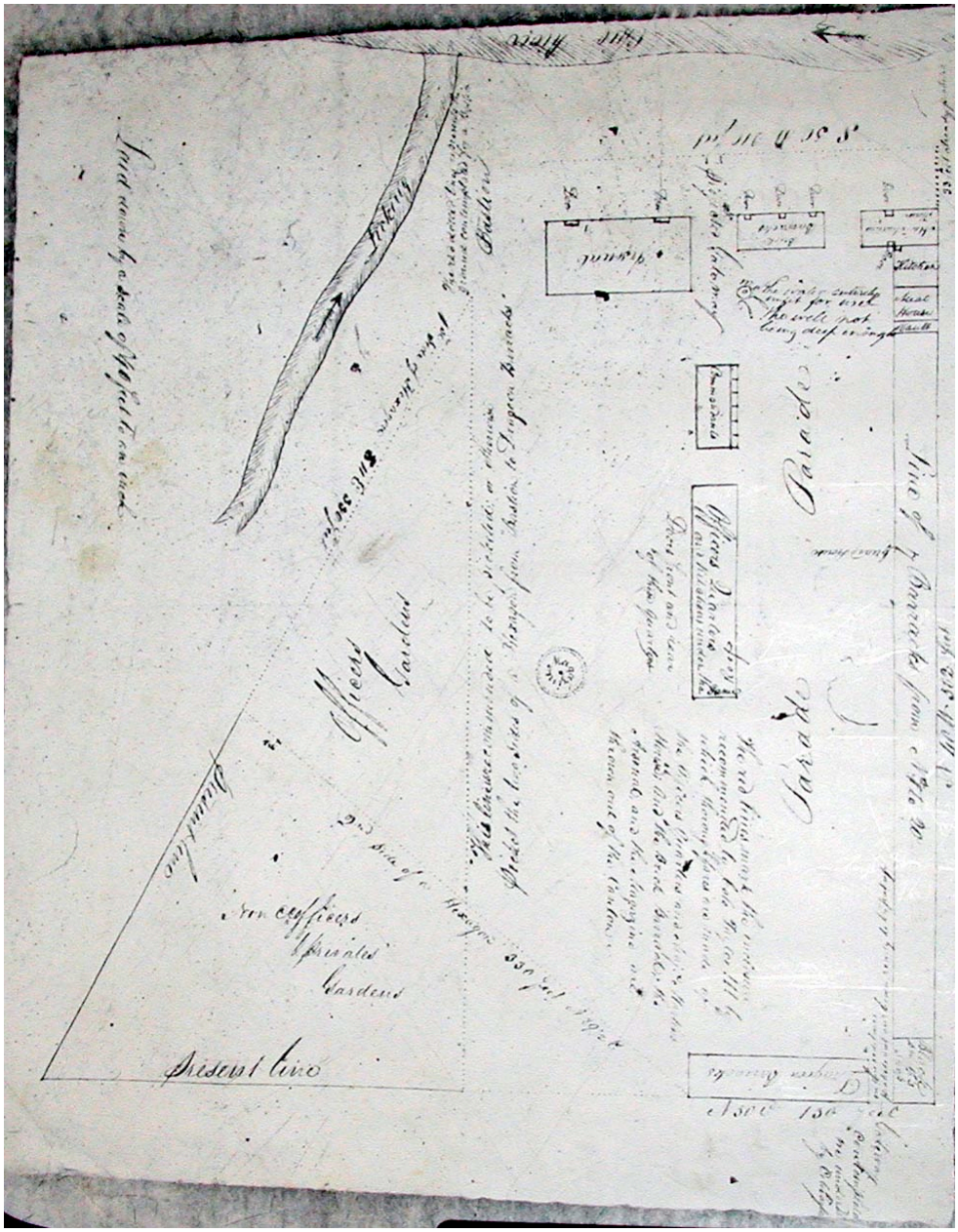


Figure 2. Newport Barracks as drawn by Lieutenant D. P. Whiting in March 1835. North is toward the top of the figure.
Source: Joseph L. Donnelly manuscript at Campbell County Historical Society.
Digital image by Jerry A. Moore

The Army Posts of this early period of history often were located at key transportation points. The confluence of the Licking and Ohio Rivers immediately across from a landing area on the Cincinnati side of the Ohio was one such logical location. From there, supplies for the armory could be delivered and the major transportation routes into the "Old Northwest" could be protected.

The plan of the Post is shown in Figure 2 in the proper perspective with the Ohio River at the top (north) and the Licking River at the left (west). Actually, some writing on the plan was oriented to each of the sides. It appears to have been drawn for viewing from any of the four sides. The reader is required to rotate the image to read it.

The need for the Newport Barracks arose when plans were made to close Fort Washington in Cincinnati as the threat of attack from the Indians waned and the property became valuable as real estate. Nevertheless, the need for an arsenal in the frontier had not diminished. James Taylor offered some of the 1,500 acres of land that he owed in Newport for the arsenal. It was said that he had obtained the land by trading a haunch of buffalo meat for it. He intended that he would sell lots for a new town that he called Newport. The Government agreed to pay Taylor $1.00 for four acres of that land in 1803. An Army Post would attract buyers for the other lots. It probably didn't hurt that James Madison, who was Thomas Jefferson's Secretary of State at the time, was Taylor's cousin. The Government bought two additional acres for $47 in 1806. In 1848, the City of Newport donated the small remaining strips of land between the Barracks property and the rivers.

The site selected for the new Post was on the floodplains of the two rivers. Floodplains are named to indicate that they are areas that have been leveled by deposits of alluvium left behind from the relatively frequent flooding events. The leveled area on which the Post was constructed was no doubt an attractive building site. However, the plain's origin should have been prescience of its fate — flooding.

Note the gunpowder magazine, the circular object near the center of the Barracks (Figure 2). In 1819 there were 300 barrels of black powder stored there. Local citizens were concerned about the absence of lightning rods. That beehive shaped brick structure was one of the oldest of the structures. The other two were a brick two-story armory to house weapons and a wood building to house the few troops who would be stationed there. Army personnel first occupied the Barracks when a company of one officer and nine enlisted men from the 1st U.S. Infantry arrived on 22 May 1806.

Note also that there was a water well, described as entirely unfit for use, located near the arsenal building on the bank of the Ohio River. Later, cisterns were constructed within the Post. Those cisterns were insufficient to provide enough water during droughts and during times when the Post population was high. In those times, drinking water was brought by carts from the Ohio River. That may not have been as bad as it sounds because there were several "sinks" (toilets) within the Post as well. The "sinks" were from six to fifteen feet deep and some were connected to an underground sewer. The others were cleaned out periodically by contractors. Even so, the 1872 report described the sanitary conditions as "generally good."

Captain Meriwether Lewis stopped by the Post in September 1803 on his way to St. Louis to join Lieutenant William Clark for their famous exploration westward. During the War of 1812, it served as a supply depot for General William Henry Harrison who later become President of the United States. He used it as a staging base for troops whom he subsequently led to battle in Tippecanoe. Afterward, it held over 400 British prisoners who had been captured during that war, a number that was greater than Newport's population. It was used years later to muster troops used in the Texas War for Independence, the Mexican War, and as Headquarters for the 13th Infantry during the Civil War. It continued to be used for various military purposes until 1894. Figure 3 shows how the Post appeared during later years.

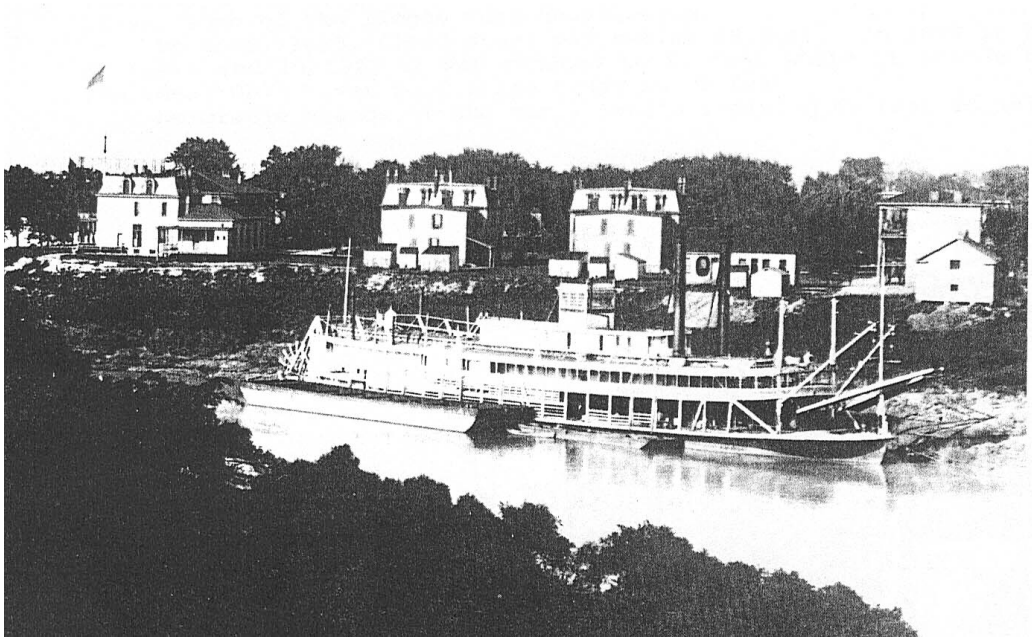


Figure 3. Newport Barracks in Later Years as seen from the West.
The Licking River is in the foreground.
Source: Campbell County Historical Society

The population of the Post fluctuated as the perceived need for it changed. The facilities changed accordingly. After the Civil War, the post facilities were neglected. Interest rose again in the 1870's. An Army report from 1872 described the Post as having fifteen buildings. One of these was a stable for up to ten animals and quartermaster supplies for 350 men for one month.

The Headquarters of the Department of the South was moved to Newport Barracks in 1878. Along with it came its commander, a Brigadier General. Conditions and facilities improved. However, after flooding occurred in consecutive years 1882 and 1883, the Headquarters moved to New York. The Post was disestablished in 1894.

LOCATION OF OBSERVATIONS

Weather observations began after the physicians were assigned to the fort. The exact location of those observations within the Newport Barracks cantonment area is unknown. However, a drawing (Figure 4) offers some evidence of where it may have been.

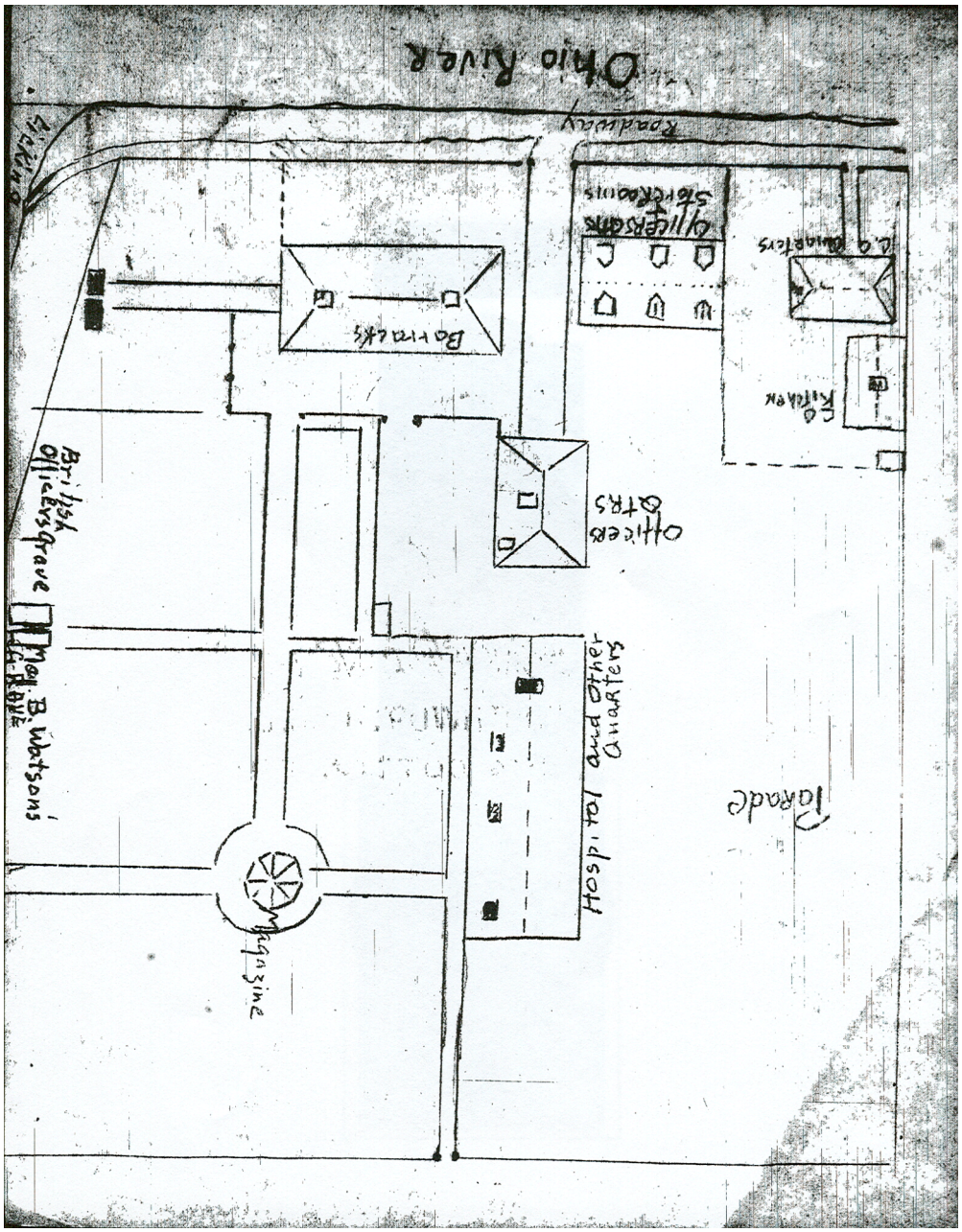
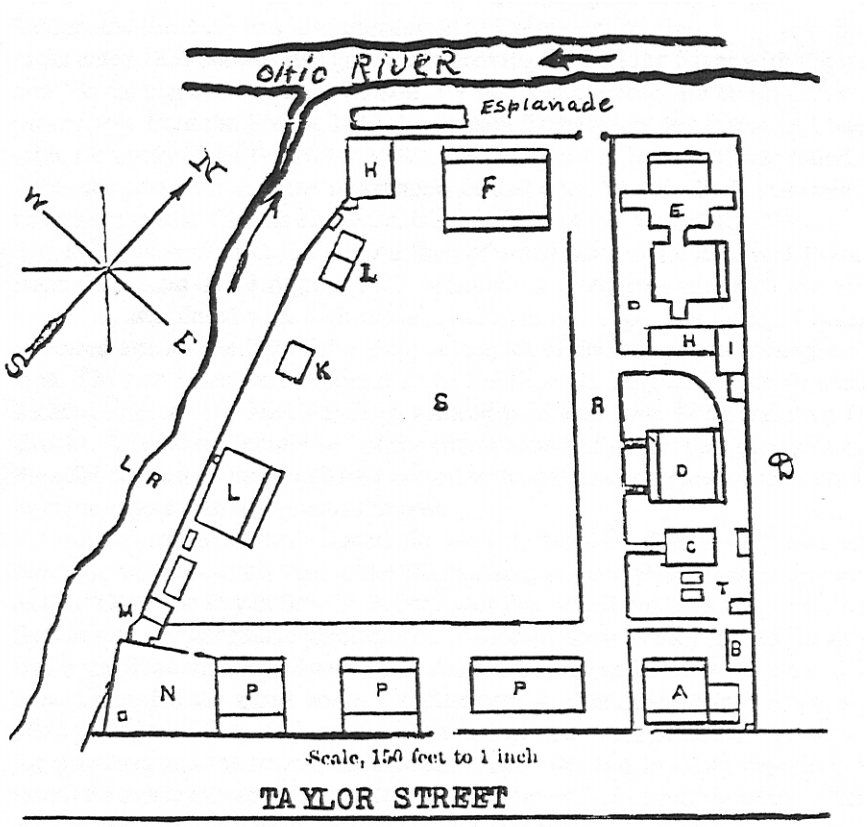


Figure 4. Newport Barracks after the Physicians Arrived.
Source: Joseph L. Donnelly manuscript at Campbell County Historical Society.

Note that what had been the Officers Quarters in Figure 2 was now the Hospital and other quarters. Actually, the hospital was one room in the building. Dr. Bennett complained of the proximity of quarters to the hospital room where small pox and other diseases were treated.

It seems likely that the thermometer that Dr. Bennett used was located outside on the north-facing wall of the hospital (the Ohio River side). The north side of a building at that time was the recommended location for hanging a thermometer.

The Post Surgeon Grover Perin prepared a diagram of the Post for a report he made in 1872. See Figure 5. The number of buildings had increased significantly from the earlier drawing.



A = Hospital, B = Laundry and Store Room, C = Church, D = Officers Quarters, E = General Headquarters, F = Headquarters, H = Stables, I = Commisary and Carpenter Shop, K = Magazine, L = Guard House, M = Men's Sinks, N = Wood Yard, P = Barracks, LR = Licking River, R = Road, S = Parade Ground, T = Tents

Figure 5. Newport Barracks in 1872.
Source: Newport Barracks, Joseph L. Donnelly, page 58

The hospital (A in the Figure 5) was located in the southeast corner of the cantonment area (Figure 5). It was a two story brick structure with a one story frame dining room and a one story frame kitchen attached. During 1868-1869, the average number of patients in the hospital was

11.9 compared to its capacity of eight. The overflow during the cholera epidemic required the erection of tents (T in the Figure 5) to house them.

The exact location of the weather observation site is not known. One would suppose that it probably was in the area of the hospital near to the physicians who made the observations.

Throughout the observation period at Newport Barracks from 1825 to 1894, the observations must have been taken within the cantonment area. That area was relatively small and did not change in size. There were additions of buildings. Likewise the City of Newport that had grown around the Post. In 1800 its population was just 106 people but it was the 17th largest town in Kentucky at that time. The Census of 1800 listed the sex and age of those people. From those, one can guess that those people lived in about fifteen houses. Not exactly urban sprawl but by 1820 there were 234 residents and the city continued to grow throughout the life of the Post.

THE OBSERVERS

1825 - 1828

During the period from July 1825 through June 1828, Dr. Jonathan Bennett made daily observations. He was a contract physician, a citizen physician as they were called. The first record (Figure 1) listed the location as Newport, Kentucky although the observations were made at Newport Barracks. He didn't sign the form either but his handwriting is distinctive as seen on subsequent forms. He recorded his observation on a hand drawn form. He recorded the sunrise, 2 p.m., and sunset temperature in Fahrenheit. He entered the wind direction at those three times and also the weather. The weather in this case was the sky conditions and visibility restrictions. He drew a column he titled "rain" and recorded amounts in inches and tenths. He entered ½ of a tenth as well. For example, the first month had 1.6 ½ inches. About half the page was reserved for remarks. He remarked about the timing and type of the rainfall, the occurrence of lightning, or other events such as Indian Summer (October 1825).

He added a column or snow on his November 1825 form. He mentioned a snowfall in the remarks but didn't quantify it. In December, he entered quantities of both rain and snow but not on the same day. In February 1826, he remarked that the snow fell 3 ½ inches but in the snow column he entered 0.3 ½ . The total snow for the month was entered as 0.3 ½ even though the column heading identifies the units as inches and tenths. In the warm months, the snow column is omitted. In November 1826, he began recording the snow depth with the decimal in the correct place.

Dr. Bennett's observation record ends with June 1828. It is known that he continued his medical duties because he ordered smallpox matter in 1831 and wanted more than one room for a hospital.

1828-1847

The Army Medical Corps continued to take observations. There is no doubt that they were made at Newport Barracks as they had been in previous years. However, the whereabouts of those observation records is unknown. One possibility is the floods that are known to have damaged other of the Post's records. Alternatively, there was a report that the Post's records were sent to Washington in the 1870's. A newspaper article reported that many of the old Post documents were misplaced at that time. That may explain the absence of the meteorological records from Newport Barracks for this period. In any event, the records from July 1828 to July 1847 are missing.

It is unfortunate that our knowledge of the weather is hampered because there were several weather induced or influenced events. For example, the flood of 1832 brought sickness to the

soldiers and residents of the Newport area, killing 1,200 people. By 1837, the barracks were nearly deserted.

With the barracks heavily damaged from the water, the U.S. government gave James Taylor $20,000 to make repairs. The repairs were made and a hospital was built next door by 1845.

In 1843, a new observation form was implemented by the Army. It retained a Remarks section. The observer was given these instructions for making remarks:

> Under this head may be noted all remarkable phenomena, especially sudden and simultaneous changes of wind and temperature; their effect on the barometer; the moment of greatest depression of the barometer in the passage of storms; currents of clouds moving in different directions, and at different heights; the rise and fall of rivers and lakes; remarkable tides; the opening and closing of navigable waters; the last killing frost that occurs in spring, and the first in autumn, as shown by their effects on the tender buds, leaves, and germs of fruit trees, &c.; the commencement and progress of vegetation; the first appearance and departure of birds of passage; thunderstorms, near and remote; silent lightning, with its direction and elevation above the horizon; falls of hail, snow, and sleet; fogs; white or hoar frost, &c.
>
> Always examine the heavens at the latest observation, whether there be any Aurora, or shooting stars; and especially about the 10th of August, and 12th and 13th of November, see whether there be any great number of luminous meteors visible, stating the number observed in an hour, or at least in a quarter of an hour. In case of great fires occurring in clear, calm, dry weather, with high dew point, observe whether clouds form over the fire, and describe the phenomena.

In addition to those instructions for remarks, there was this guidance:

> Connected with meteorology are many interesting subjects of inquiry, which can only be elucidated by wide-spread, simultaneous observations. The medical officers of the army are therefore confidently invited to co-operate in the collection of data tending to advance the interests of science.

Newport Barracks' first observer's remarks mostly concerned precipitation but also included "The maple, honeysuckle, willow and peach trees beginning to foliate" (March 1826) and "The whole day has been enveloped in a thick yellow haze so as to make it difficult to read small print" (November 1827). The new instructions for remarks changed the existence of

remarks and added variety to remarks that would be made over the next sixty-five years of observation.

1847-1892

The extant record from Newport Barracks continues with reports beginning with July 1847. Now the observer was provided a printed form. Dr. Jonathan B. Wells was the first full-time surgeon assigned to the Post. He entered the temperature, sky condition, wind direction, and remarks at sunrise, 9 a.m., 3 p.m., and 9 p.m. The location of the observation site was listed as 39° 45’ north latitude and 84° 15’ west longitude. In September 1847, he made note that he had requisitioned a barometer and a rain gage because of the “changes of the weather & the quantity of rain.” He left with 168 men for Mexico in April 1848. He was replaced by Major Clement A. Finley.

Major Finley had obtained his medical degree from the University of Pennsylvania and then joined the Army to follow the same career as his father had chosen. He served as the chief medical officer of the force fighting the Black Hawk War in 1833 and deployed with the Army into Mexico 1846. He was the medical director of General Zachary Taylor’s Army. An illness caused him to be permanently relieved from duty in Mexico and ordered to Newport Barracks, Kentucky. There he made the weather observations (Figure 6) beginning in February 1848.

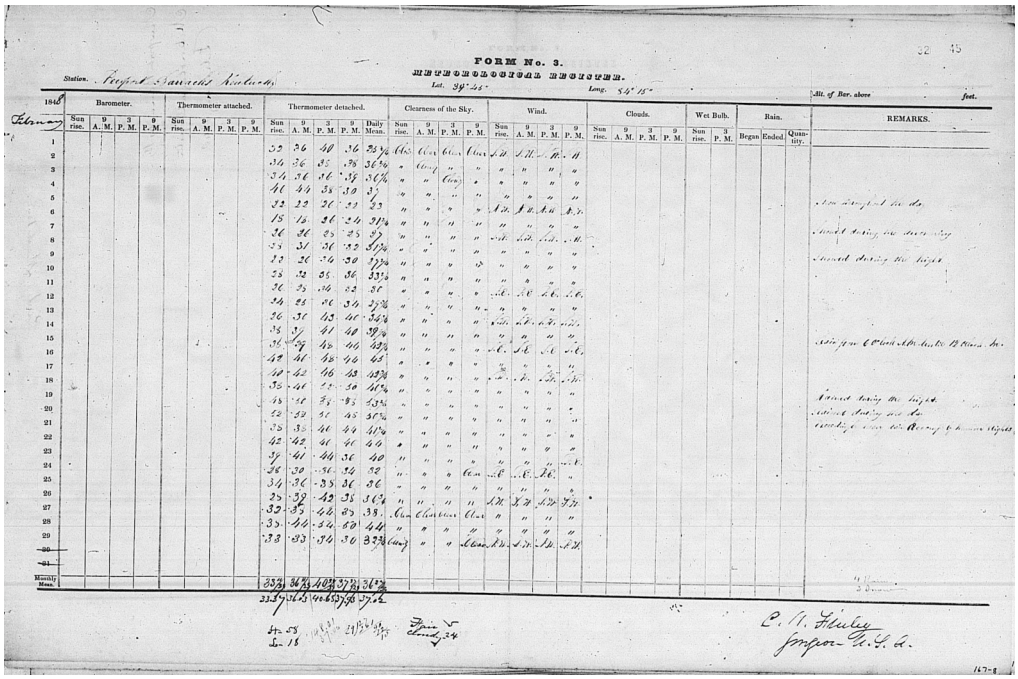


Figure 6. Observations February 1848 at Newport Barracks by Major C. A. Finley. Source: Original Record

Major Finley served at Newport Barracks until 1849. After twelve more years in the Army, President Abraham Lincoln appointed him to be Surgeon General of the United States Army on 15 May 1861. He was sixty-four at that time. After a serious disagreement with Secretary of War Stanton, he retired just two days before the rank of the Surgeon General was advanced to Brigadier General. In 1865 in recognition of his meritorious service, he was promoted to brevet rank of Brigadier General.

Figure 7. Colonel Clement Alexander Finley, Surgeon General of the Army, 1861-1862
Source: From a Poster "The Surgeon General and His Predecessors," Office of Medical History, Office of the Surgeon General

In July 1849, Major Finley's observations were entered on a new Form 3. He now entered the wind force as well as its direction and the clouds four times per day. He also entered the wet bulb temperatures at sunrise and 3 p.m. and the precipitation's beginning and ending times and amounts in inches and tenths. Apparently, the rain gage ordered by Dr. Wells had arrived.

Dr. Landon C. Rivers was the Acting Assistant Surgeon. He was the weather observer from December 1849 through July 1850. He was succeeded by Dr. Bernard Myles Byrne who observed through September 1853. Dr. E. Lee Jones substituted from the October 1851 through March 1852 after which Dr. Byrne resumed the duty. These physicians were recording the weather during the cholera epidemic that spread rapidly through Cincinnati and Newport during 1849-1953. Within a few days, 57 of the 382 men at Newport Barracks were sick and 16 of them

died. Perhaps drawing from this experience, Dr. Bryne would thereafter author “An Essay To Prove The Contagious Character Of Malignant Cholera : With Brief Instructions For Its Prevention And Cure” in 1855.

These observers continued to make almost daily comments about the weather and other things of interest to them. Their remarks included comments on frost, dew, fog, thunder, lightning, gusty winds, and rises in the Ohio River. Comments like "It blew a hurricane at 1 p.m. During the space of 20 minutes there falling hail stones the size of chestnuts" (May 1851). The word “hurricane” referred to wind velocity and not to a tropical storm. Many remarks were quite diary like entries such as "Tolerable pleasant today with occasional showers" (April 1852). Some were terse, "Chilly", "Rainy", or "Pleasant" (May 1852). Some recorded unusual events, "The Ohio River frozen over. Crossing on the ice" (January 1852). Like most observers of their day, they used the remarks to record a wealth of information about their environment.

Dr. Glover Perin (Figure 8) took over the observations in April 1853 and continued until December. Ten years later in 1863, Dr. Perin would become the medical director for General Rosecran’s Army of the Cumberland, a considerable responsibility. At the battle of Chattanooga, he had to cope with administering care for over 9,000 wounded.

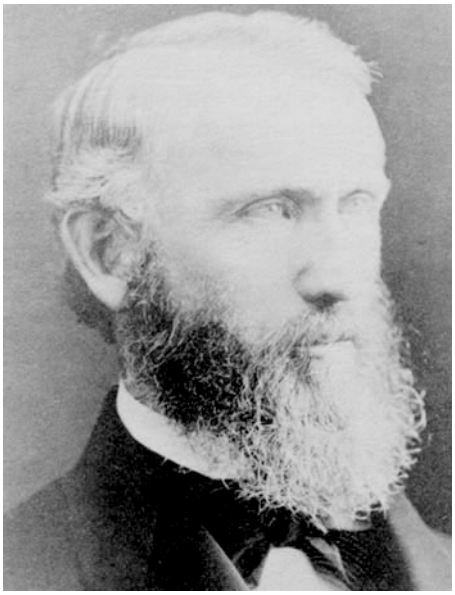


Figure 8. Dr. Glover Perin
Source: The Army Medical Department 1818-1865, Mary C. Gillett

The Army’s weather network had expanded since its inception and by 1853 surgeons at 97 Army Posts throughout our country were making daily observations. One of those was Dr. William J. Sloan who volunteered to be assigned to Newport Barracks when Dr. Perin departed. The assignment allowed him to study at the famous Cincinnati Medical College. He made the observations at Newport Barracks from December 1853 through February 1856. He made

frequent remarks to provide qualitative information about the weather. Occasionally, his remarks were necessarily long. In January 1856, Dr. Sloan reported that the average temperature was 18.33˚F. To which he added the following remarks.

> The average mean temperature for the month of January for 18 years was 31˚. This has been the coldest month ever known here. On a few hours only during the month has the thermometer indicated a temperature above the freezing point. Snow has remained upon the ground since the 25th of December 1854 with frequent accumulations. The River has been firmly closed since January 6, 1855, and the heaviest loaded crossed in safety. The atmosphere has been dry, pure, and bracing. Not a case of pneumonia or other inflammatory disease has occurred at the fort.

This quote from illustrates the value of the qualitative remarks made by the observers. Each sentence in this example is instructive about the data in the report. First, there was a comparison of the current observations with the period of record. Second, a remark transformed daily temperature data into the equivalent of hourly reports that further defined the abnormality of the month. Third, there was a gratuitous snow cover report not specifically required by the instructions but which spoke to the duration of the cold episode. Fourth, the required freezing report for the Ohio River was expounded to indicate thickness of the ice with a clarity that only examples of load bearing strength could give. Fifth, a description of the air mass causing the weather is included to confirm that this indeed was an Arctic air mass. Finally, Dr. Sloan concluded with a tone of surprise that illness had not followed the cold spell indicating the supposition that there was a suspected cause and effect relationship between weather and disease.

The Surgeon General's Office provided a new form in June 1855. The Meteorological Register as it was titled changed the observation times to 7 a.m., 2 p.m., and 9 p.m., added a column for wind force, and added column for hygrometer readings. At the bottom of the form was a climatological summary of the month. The new form was used immediately but the hygrometer readings were not entered until December 1855. The hygrometer entries were in Fahrenheit.

Dr. Charles S. Tripler assumed the observation duties in April 1856. He was a graduate of Physicians and Surgeons in New York City. In addition to his duties at Newport Barracks, he was lecturing at the Medical College in Cincinnati and writing a book, Manual for Medical Officers, that was published in Cincinnati. He would later write other medical manuals. His duty continued for five years through March 1861 when he was appointed as the Medical Director for the Army of the Potomac. There followed a succession of observers, Dr. George W. Thornton from April 1861 through May 1861 and Dr. Francis L. Town from June 1861 through August 1861.

Dr. Nathaniel B. Shuler was appointed surgeon at a salary of $100 per month. He had studied at Harvard and was perhaps drawn to Newport because of the cholera there. Some Civil War casualties were sent to Newport Barracks for care. Among them were 102 soldiers who had

suffered wounds in the battle of Shiloh. Through it all from September 1861 through July 1865, he continued to make weather observations.

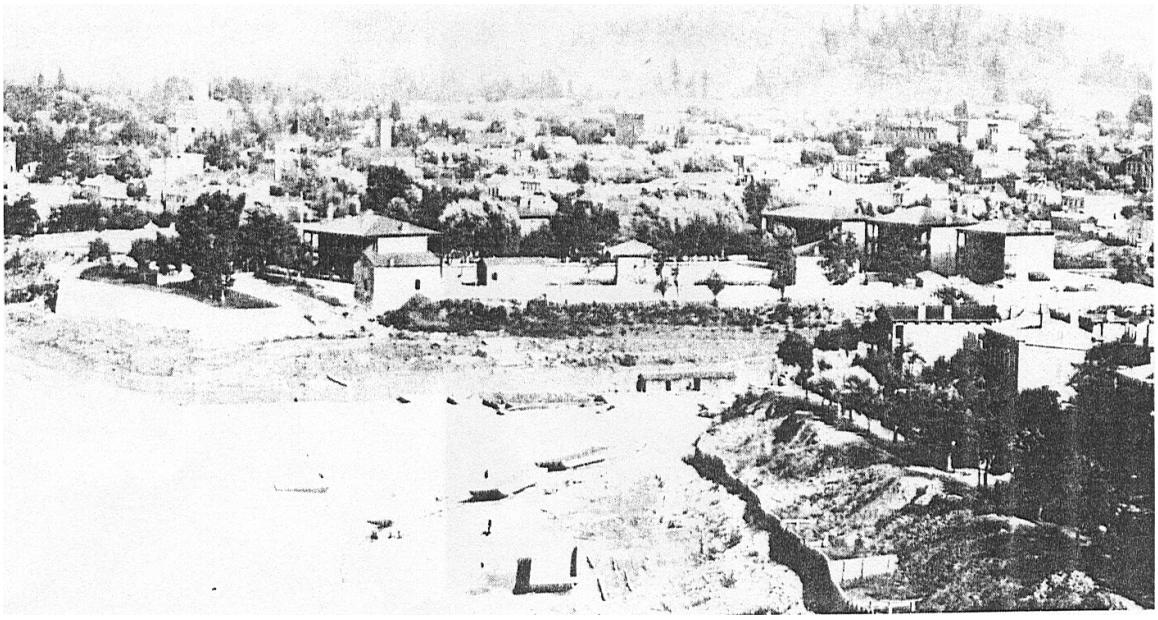


Figure 9. Newport Barracks in 1865.
Source: Newport Barracks, Joseph L. Connelly

Dr. Charles C. Gray made the weather reports from August 1865 through September 1865. Then Dr. Glover Perin returned to Newport Barracks after the Civil War ended. He was now a Brevet Lieutenant Colonel and again became the meteorological record keeper as he was in 1853. This time his tour was longer, from October 1865 through August 1870. In March 1870, the location of Newport Barracks was changed so that the longitude was 7° 24' 4" west of the Capitol building in Washington D.C. and the elevation was 588 feet above mean sea level. That convention continued through September 1890 until the new Form 34 omitted both latitude and longitude.

He was succeeded by Dr. Ebeneezer Swift in September 1870 who served until November 1875. In 1871, Dr. Swift complained about the "foul emanations" that pervaded the Post because there was not enough water to carry away the sewage. The shortage of water was so bad that bathing was not possible. During his five years, Dr. Peter Moffatt substituted for him in May 1872, Dr. George W. Adair in February and March 1875, and Dr. Augustus A. Youmans in September 1875.

Cholera returned again during Dr. Youmans' tour and continued after Dr. John L Phythian replaced him. Both of them complained about the odor from the "sinks" and the offal dumped on

the banks of the rivers. They also dealt with smallpox and malaria that were prevalent at the same time. Dr. Phythian reported the weather from December 1875 through May 1876.

1876-1888

There followed a gap of twelve years for which no weather records have survived. There were severe floods during 1882, 1883, and 1884. Many of the Post's records were damaged. Perhaps the weather records were among them.

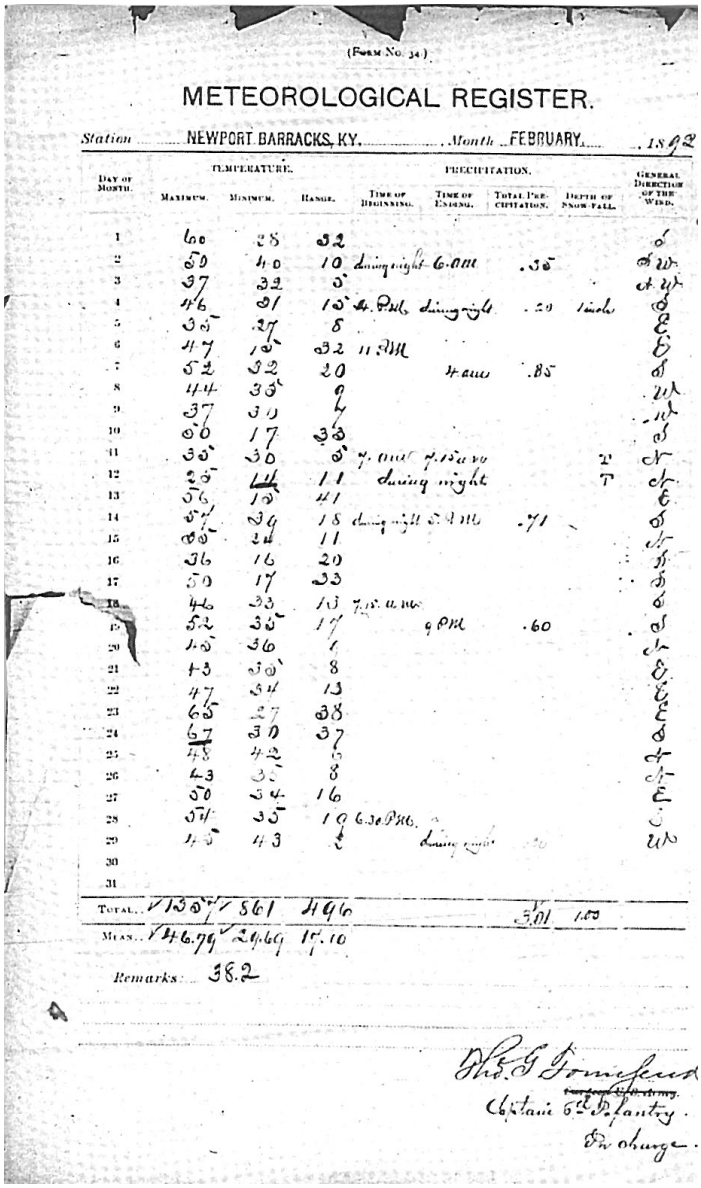
1888-1892

The observation record resumed with Dr. Alonzo R. Chapin in December 1888 who used a new form. It was titled Meteorological Register but was greatly reduced in data requirements. Only the maximum and minimum temperature; the range of temperature; the precipitation beginning, ending, and amount; depth of snowfall; and general direction of the wind were required. He continued observations through October 1889.

Dr. Henry I. Raymond followed as the observer from November 1889 through February 1891. He was also faced with rampant malaria and typhoid fever. Water from the roofs of the Post's buildings went into trenches and sewers. Then there wasn't enough rain to flush the sewers into the Licking River. The stench was inescapable. One supposes that there was increasingly widespread support for the move to higher ground that General Phillip Sheridan recommended in 1887.

Dr. Raymond was the last physician in the long chain of observers at Newport Barracks. The task was relegated to an officer from the 6th Infantry that was stationed there. The days of the Post itself were now numbered.

THE END OF NEWPORT BARRACKS



(Form No. 34)

METEOROLOGICAL REGISTER.

Station NEWPORT BARRACKS, KY. Month FEBRUARY 1892

Day of Month.	Temperature. Maximum.	Minimum.	Range.	Precipitation. Time of Beginning.	Time of Ending.	Total Precipitation.	Depth of Snow-Fall.	General Direction of the Wind.
1	60	28	32					S
2	50	40	10	during night 6.0 AM		.35		S W
3	37	22	5					S W
4	46	31	15	4 PM	during night	.20	1 inch	S
5	35	27	8					E
6	47	15	32	11 PM				E
7	52	32	20		4 AM	.85		S
8	44	35	9					W
9	37	30	7					N
10	30	17	13					S
11	35	30	5	7.00 AM	7.15 AM		2	N
12	25	14	11	during night			T	N
13	56	15	41					E
14	57	39	18	during night	5.0 AM	.71		S
15	35	24	11					N
16	36	16	20					S
17	50	17	33					S
18	46	33	13	7.15 A.M.				S
19	52	35	17		9 PM	.60		S
20	45	36	9					N
21	43	35	8					E
22	47	34	13					E
23	65	27	38					E
24	67	30	37					S
25	48	42	6					N
26	43	35	8					N
27	50	34	16					E
28	51	35	16	6.30 PM.				S
29	45	43	2		during night	.20		W
30								
31								
Total	1350	861	496			3.01	1.00	
Mean	46.79	29.69	17.10					

Remarks: 38.2

Thos. G. Townsend
~~Surgeon U.S. Army~~
Captain 6th Infantry.
In charge.

Figure 10. The Last Observer Report from Newport Barracks, February 1892
Source: National Climatic Data Center

Captain Thomas G. Townsend, 6th Infantry was the last observer beginning in March 1891. The long history of observations by surgeons had ended. His February 1892 report was the last of the long record from Newport Barracks (Figure 10).

The National Climatic Data Center assigned station number 155761 to the Newport Barracks station in the digital record.

The floodplain of the Ohio lived up to its name and over the lifetime of Newport Barracks there were numerous flood events. In 1815, the floods reached 62 feet (flood stage was 45 feet).

The flood of 1832 destroyed houses in Newport. The floodwaters receded only to be followed by cholera. One estimate was that four percent of the Newport-Cincinnati area died from the disease. Floods were recorded in 1847 and 1882. The 1882 flood submerged the first floor of the Headquarters of the South and of course filled its basement. Records and correspondence were among the flood damage. The next year 1883 followed with another flood that inundated the Post washing away sheds and outhouses and making the hospital unusable for patient care. It crested at over sixty-six feet. The following year saw another flood that was devastating and caused considerable damage to the Post. Unrelenting, the rivers flooded again in 1884 (Figure 11) reaching over seventy-one feet above the low water mark, the highest recorded to that date. Quarters for the troops had to be found elsewhere

Figure 11. Newport Barracks during the 1884 Flood.
Source: Newport Barracks, Joseph L. Connelly

Note that the water had reached the bottom of the first floor windows and there would have been several feet of water inside the buildings. The fate of Newport Barracks was sealed.

Due to higher elevation, the site of the current Fort Thomas a few miles away was chosen for building a new Post. It would train troops at a location that wouldn't be flooded as it had been in the "bottom" land at Newport Barracks.

Thus it came to pass that Newport Barracks was abandoned on 10 November 1894 and the new Fort Thomas occupied. Congress then approved the transfer of ownership of the Newport Barracks property to the City of Newport for their use as a park. The transfer was made on 1

January 1895. But, the commander of Fort Thomas, Colonel Cochran, reported that weather had the last laugh.

> I have the honour (sic) to report that in compliance with instructions, I formally transferred Newport Barracks to the City of Newport. After consultation with the Mayor it was decided, on account of the severity of the weather, to pospone (sic) the contemplated festivities.

Ohio River floods were the certainly the reason that Newport Barracks was closed as an Army Post. More importantly, the floods were also the reason for the eventual destruction of the Post albeit not directly. Rather, the floods required the construction of artificial levees and floodwalls to protect the City of Newport and surrounding areas. The huge earthen levee that was built along the south side of the Ohio River and east side of the Licking River covers most of the area where the Post was once located. A public housing project now occupies the remaining part of it. Figure 12 is an orthographic image of the area as is now appears.

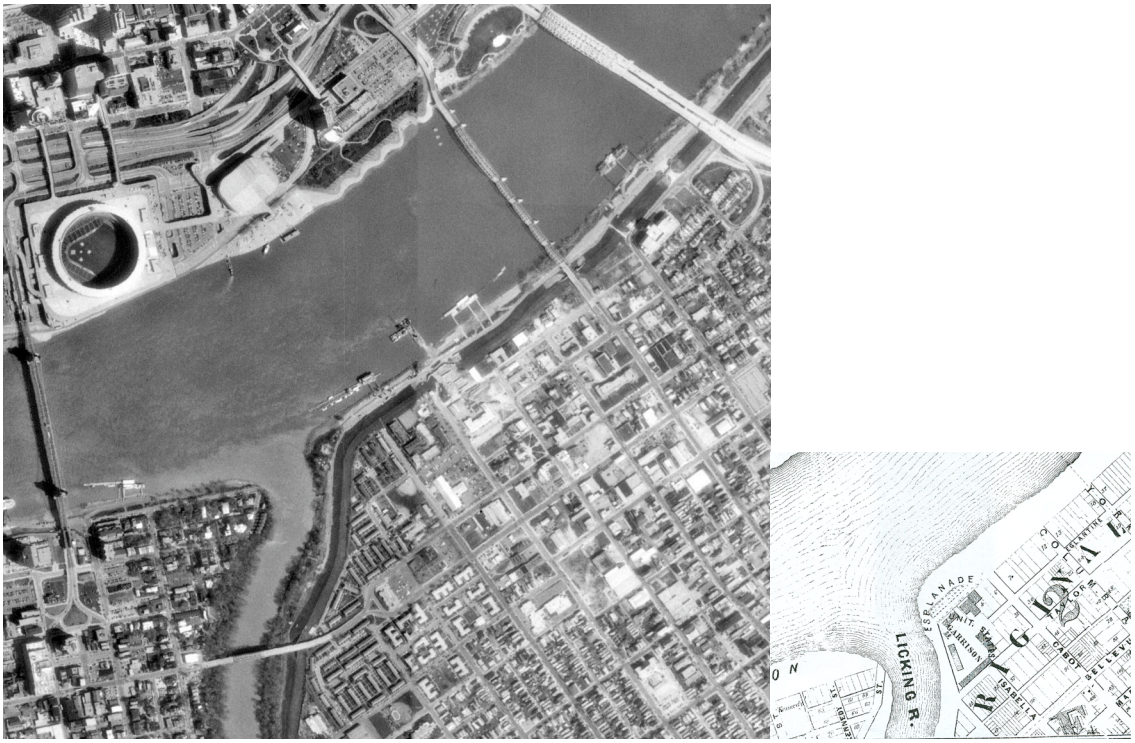


Figure 12 . Orthographic Image Of The Area That Was Occupied By Newport Barracks.
Source: Digital Ortho Image Download Center, Kentucky Natural Resources and Environmental Protection Cabinet.

The Inset Map in Figure 12 was adapted from R. C. Phillips Map of Cincinnati, 1868

All that remains of the ninety years of Newport Barracks physical existence is a Kentucky Historic Marker that now stands between the levee and the Ohio River. The marker presents this epitaph for its ninety years of service:

Newport Barracks

An early army post, built in 1804, at junction of Licking and Ohio Rivers. In War of 1812 used as a military prison. Kentucky troops assembled here for the Canadian invasion, 1813. Used for training volunteers during Mexican War. Headquarters of Southern District, US Army, until Civil War, then Union recruiting depot.

Granted to city by United States Congress, 1894.

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APPENDIX 1

METHODOLOGY

The primary sources of information for this study were the Newport Barracks observers' daily weather records themselves. Copies of their monthly reports were available in the Kentucky Climate Center at Western Kentucky University and the data digitized from those reports were available from the Midwestern Regional Climate Center in Champaign, Illinois. 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 Newport Barracks, 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 Campbell County Public Library and the Campbell County Historical Society in Alexandria, Kentucky; the Campbell County Public Library in Newport, Kentucky; the Kenton County Public Library in Covington, Kentucky; the Kentucky State Archives and the Kentucky History Center in Frankfort, Kentucky; 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.

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, and the Office of Medical History in the Office of the Surgeon General, U.S. Army. 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. Orthographic photographs from the Digital Ortho Image Download Center, Kentucky Natural Resources and Environmental Protection Cabinet provided a current aerial view of the area.

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 Newport Barracks, Kentucky. 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.