HISTORY OF WEATHER OBSERVATIONS
FORT HUACHUCA, ARIZONA
1886—1948

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Prepared By
Glen Conner
9216 Holland Road
Scottsville, Kentucky

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Acknowledgements must be given to all the clerks, office managers, section heads, and others who had the opportunity to destroy the historical record but chose not to. Special thanks go to those who now maintain those records.

At Fort Huachuca, special recognition must go to Steven C. Gregory, Museum Technician at the Fort Huachuca Museum whose knowledge of the Fort's history and its documentation made research there rewarding and pleasurable.

To you who are reading this, thanks for your interest in preserving the history of weather observations.

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HISTORY OF WEATHER OBSERVATIONS
Fort Huachuca, Arizona
1870 –1948

Glen Conner
Kentucky State Climatologist Emeritus

INTRODUCTION

The history of weather observations at Fort Huachuca, Arizona cannot be extracted from the history of the Army Post, the surgeons who were stationed there, and the Surgeon General's Climate Network that required the observations to be taken. Therefore, some of their history must be examined before addressing the observational history.

The State

The area of Arizona south of the Gila River in Arizona was a major portion of the 9,640 square miles of land purchased from Mexico in 1854, the Gadsden Purchase, as we know it. In 1863, the Arizona Territory was created from the western part of the New Mexico Territory as shown in the 1867 map shown in Figure 1.

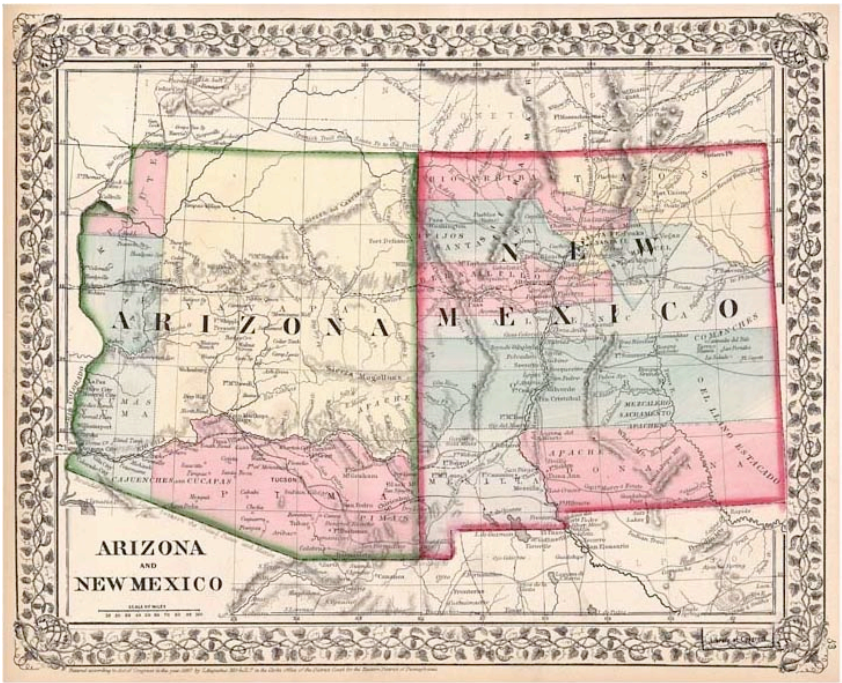


Figure 1. Arizona Territory 1867
Source: Wikipedia

The Surgeon General's Climate Network

The U.S. Army Surgeon General had established the first formal network of climate observers in the United States in 1818. Note that the purpose was to determine the characteristics of climate. Use of observations for weather forecasts would not occur until many years later. The motivation for the new network was to determine if there was a cause and effect relationship between climate and the health of the soldiers. The Surgeon General said that the purpose of the network 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."

The Locations

The Army was a logical choice for this role because it could direct action and had the authority to assure compliance. It could assure that the data were collected into a single standardized format so that geographical differences would be assessed. The Army had posts in the most remote areas of the frontier. That was very important to the government because it would be possible to know what the climate was like before large numbers of people began migrating westward.

The Instrumentation

According to Gillette, the Army furnished improved instruments to the different posts in 1842 and Surgeons Mower and Steinecke and Assistant Surgeon Cuyler, were instructed to prepare a series of rules for taking meteorological observations. The result was that the volume was printed for the period from 1842 through 1854. It contained the observations taken using the prescribed directions. It contained temperature, direction and force of winds, sky conditions, and rain and snow measurements. It was a real climatology with tables and graphs reflecting the general climate of the United States.

The Observers

The medical doctors in the Army were trained scientists, schooled in the importance of careful observations and reasoned analysis, and were a logical choice to become the weather observers. They would be capable of finding the connections between climate and disease, if they existed.

The Observations

The importance of the climate observations was evidenced by the early publication of the data. Those climate observations had been taken continually since 1820. The observations for 1820 and 1821 were published at the end of each of those years. The first Army Meteorological Register included data from the years 1822 through 1825 and was issued by Surgeon General Lovell in 1826. The second register had data from 1826 through 1830 and was published in 1840. The third was from 1831 through 1842 and was published in 1851. The scientific data collected by the Post Surgeons were published in the "Army Meteorological Register" in 1855.

Fort Huachuca

In 1877, Captain Samuel M. Whiteside was sent into the southeastern part of the Territory to establish a temporary camp for protection of settlers and to interfere with the Apache activities in the area. That first camp of about two companies of the 6th Cavalry was located about fifteen miles north of the border with Mexico. It had only tents as shelter. The camp was at the head of a valley that opened from the base of the Huachuca Mountains toward the gently sloping piedmont that extended several miles toward the north. The site had an abundance of trees and an ample supply of running water.

Fort Huachuca Hospitals

Doctor Otis J. Eddy arrived three weeks later on 23 March 1877 to become the first Post Surgeon. According to the Huachuca Scout (1977), he had four hospital tents, two of which were for wards and the other two for the office and storeroom. Wall tents were used as the hospital kitchen and mess hall. He had the assistance of one hospital steward and two hospital matrons.

On 21 January 1878, the post was designated as permanent and the following year the construction of a six-bed hospital was begun. When it was completed in February 1880, it was the first permanent structure on the post. The Carleton House, as it later became known, has survived and was being repaired in November 2006 (Figure 2).

Figure 2. Carleton House Under Repair, the Second Hospital at Fort Huachuca, 2006
Source: Author

The post was designated a fort in 1882 and it has maintained that designation since then. A new hospital was completed in June 1885 from plans (Figure 3) that were drawn and submitted by Captain Paul R. Brown, an Assistant Surgeon at the Post, and approved by the Secretary of War in 1884.

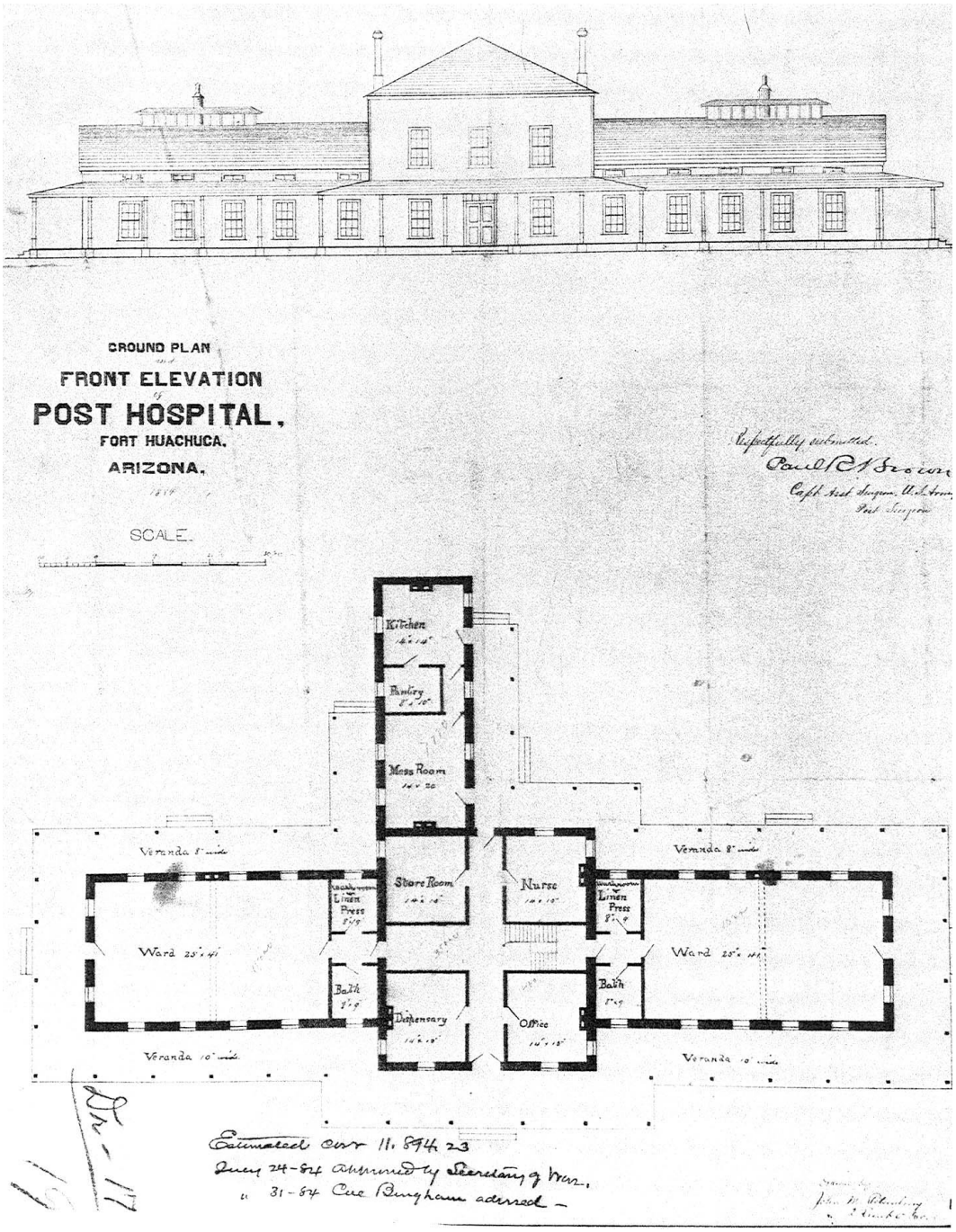


Figure 3. Plans for Hospital, 1884
Source: Fort Huachuca Museum

The new hospital (Figure 4) was completed in June 1885 and as it was envisioned by Dr. Brown.

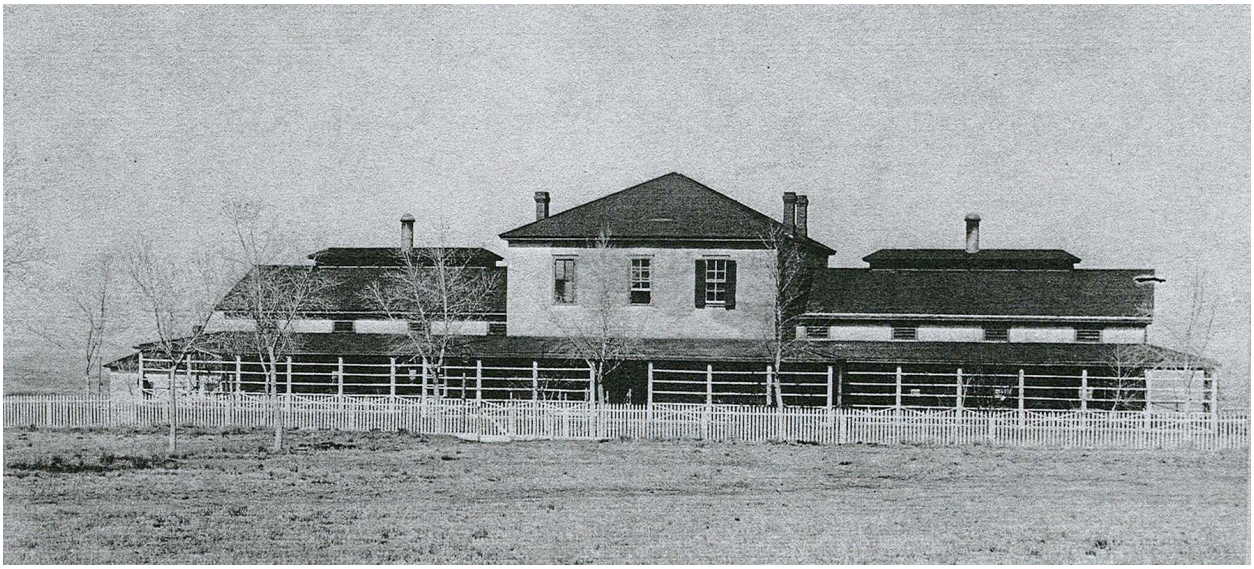


Figure 4. Hospital, 1885
Source: Fort Huachuca Museum

This hospital remained in use for 56 years.

The Fort Huachuca Climate Record

Weather observations began at Fort Huachuca on 1 January 1886. The first observer was Dr. Paul R. Brown, the same Assistant Surgeon who designed the hospital building. Captain Brown's observations were directed by U.S. Army Surgeon General as part of his climate network. That network was the first national network in the United States. The observations continued to be taken by the surgeons at the hospital until 31 March 1920.

Observations resumed on 1 December 1939 by the Army but were not made as an approved Weather Bureau site. They were discontinued again on 31 May 1940.

Goal of the Study

The goal of this study was to document the weather observational history of Fort Huachuca, Arizona. The climatic data, and information from the observations made there, are readily available and may be accessed through the National Climatic Data Center, the Western Regional Climate Center, and the State Climatologist of Arizona. The challenge of this study was to identify the role that Fort Huachuca played in the development of a federal weather observational program and where it fit in the route that followed from the U.S. Army Surgeon

General's network, through the U. S. Army's Signal Service Observers, and the Weather Bureau meteorologists, to the current National Weather Service Forecasters and their extensive observational and forecast network of today.

LOCATION OF OBSERVATIONS

Environment

The oldest portion Fort Huachuca was and is located on an alluvial fan extending from the northeast side of the Huachuca Mountains. The Huachuca Mountains rise to a peak of 9,445 feet MSL, over 4,000 feet higher than the Fort. To the northeast, the piedmont slopes downward for several miles. Figure 5 is a view southwestward toward the Huachuca Mountains. The hospital is in the left foreground. The picture quality prohibits seeing the shelter.

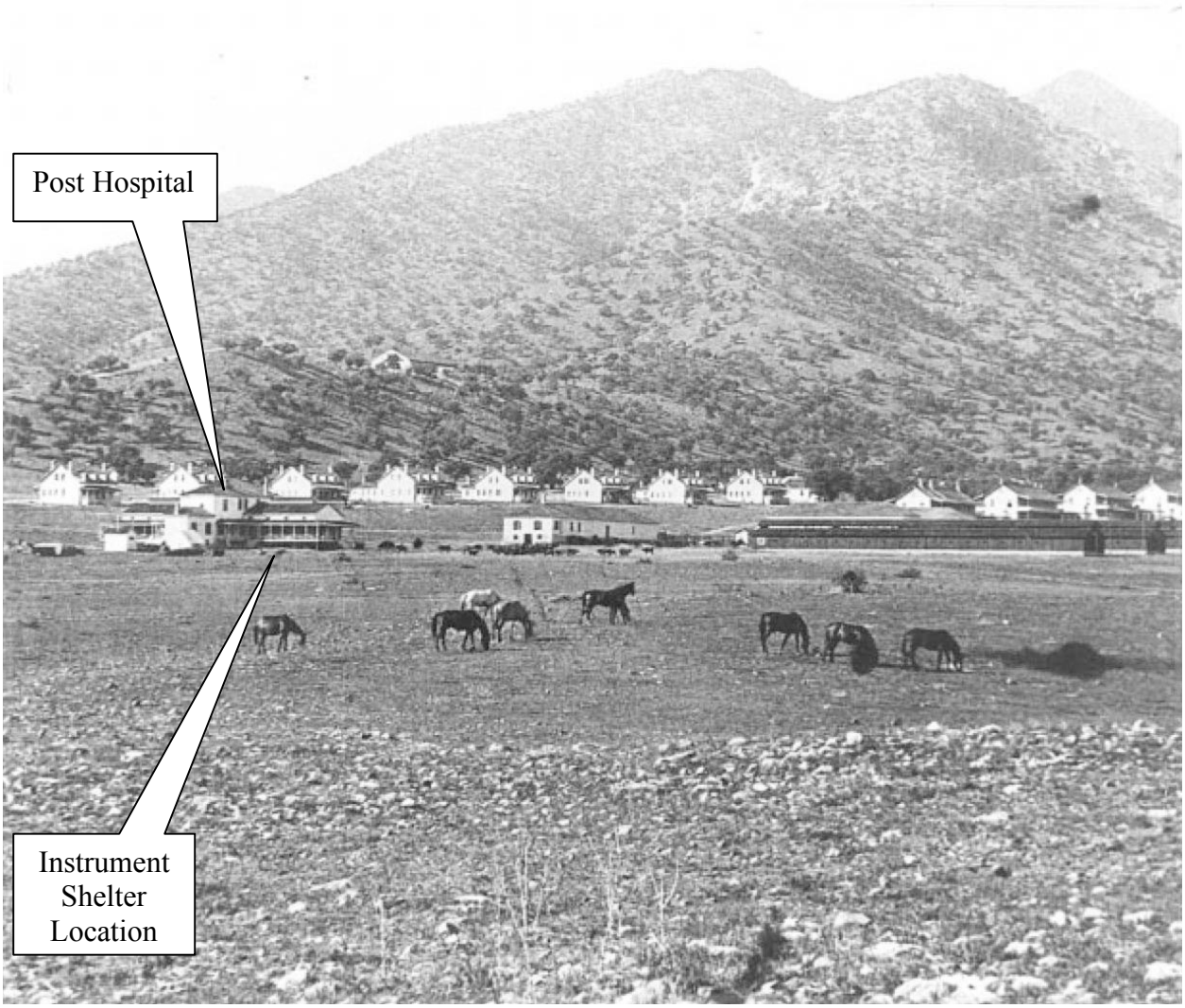


Figure 5. Fort Huachuca, 1887
Source: Fort Huachuca Museum

The Fort was established at a site that, although selected for other reasons, had good climatic attributes according to Sellers (1974).

> The two dominating features of the climate of Fort Huachuca are its abundant rainfall in summer and its mild temperatures throughout the year. Being located on the eastern slopes of a mountain range in southern Arizona, Fort Huachuca is in a perfect position to get a maximum amount of rain from the moist tropical air masses which move into the area in the summer from the east and southeast. Under the combined influence of strong surface heating and orographic uplift of the air over the Huachuca Mountains, numerous showers and thundershowers often develop near the Fort during the warmer hours of the day. Although these showers are brief, they are intense enough and frequent enough to account for about fifty percent of the Fort's annual precipitation.

He also wrote, "The mildness of the temperatures at Fort Huachuca, both in winter and summer, would be difficult to exceed elsewhere in the state."

Vegetative cover varies from conifers in the higher elevations of the mountains to deciduous trees in canyons and lower elevations. Mesquite prevails over much of the valley floor.

Fort Huachuca became an important part of the network of weather stations in Arizona. The map shown in Appendix 1 shows the impressive distribution of stations in 1892.

Latitude and Longitude

A summary of the latitude and longitude of the observation stations as recorded by the observers are shown in Table 1. The location and elevation were measured by the author using a GPS receiver.

Table 1. Latitude and Longitude of Station Locations

Location	Period	Latitude	Longitude	Elevation
*Post Hospital	1 Jan 1886–31 Mar 1920	31˚ 33.103' N	110˚ 21.947 W'	**5,077 Ft MSL
**Hospital Steward's Quarters		32˚ 33.075' N	110˚ 21.918' W	5,089 Ft MSC

* Approximate location of the instrument shelter
** The elevation was listed by inspectors in 1906 as 5,100 feet, apparent rounding.
*** The Steward's Quarters were Next Door to the Hospital

Surgeon General Years 1886-1920

The records indicate that the instrument shelter site was at the Post Hospital during the entire period that observations were made as part of the Surgeon General's network. The hospital building was located at the end of a large parade ground and, in the early years, away from most other buildings (Figure 6).

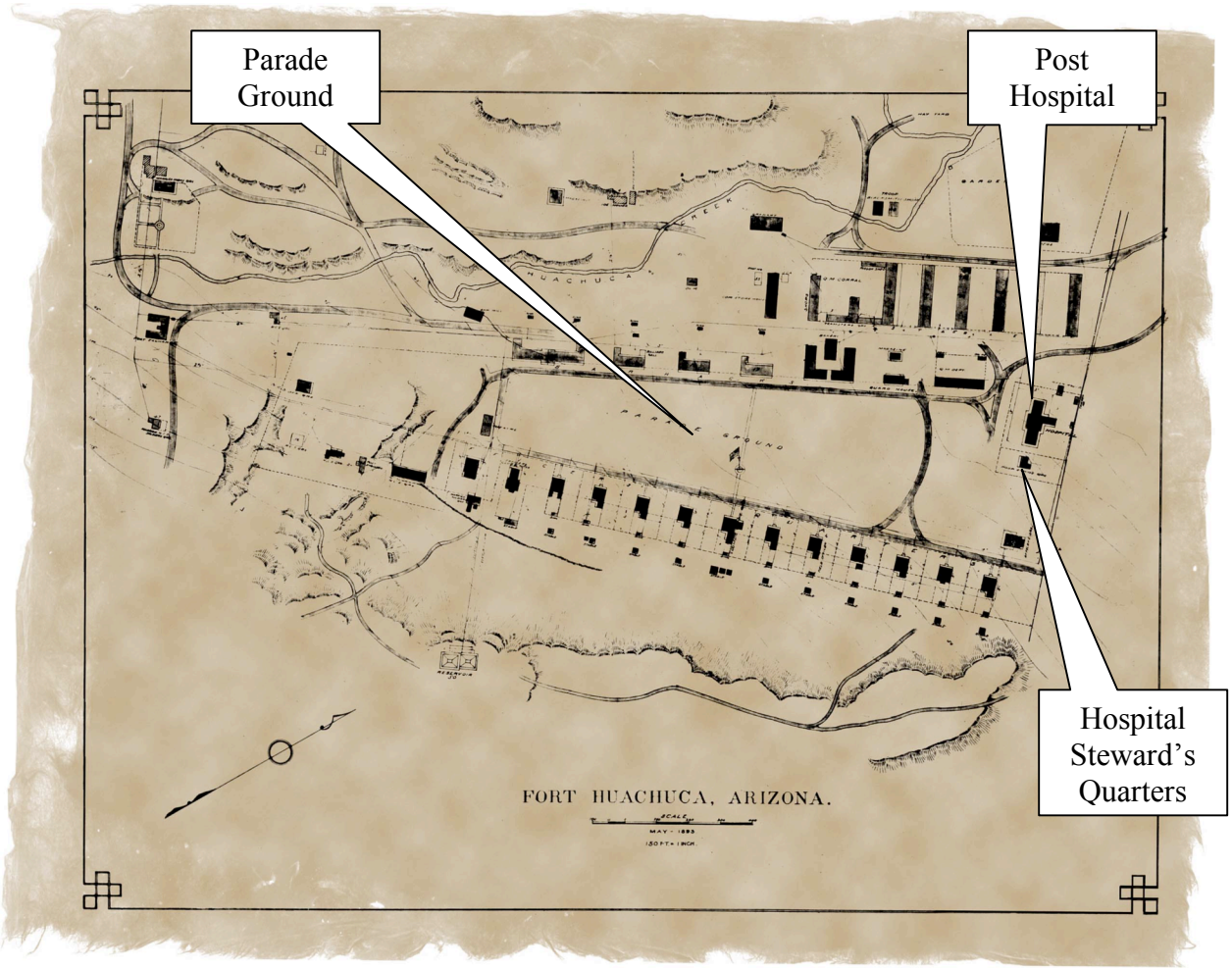


Figure 6. Fort Huachuca, 1893
Source: Fort Huachuca Museum

Note the north arrow on the map. Several maps of early Fort Huachuca exist and their orientation varies. Rolak's map (1974) was one that had north at the top of the map. The 1887 map of a proposed sewage system had north at the bottom of the map.

A newer hospital was built in 1941 and the hospital building (Figure 7) was used afterward for other purposes. It appears much the same as it did during the observational period except for an new structure that was added to the back.

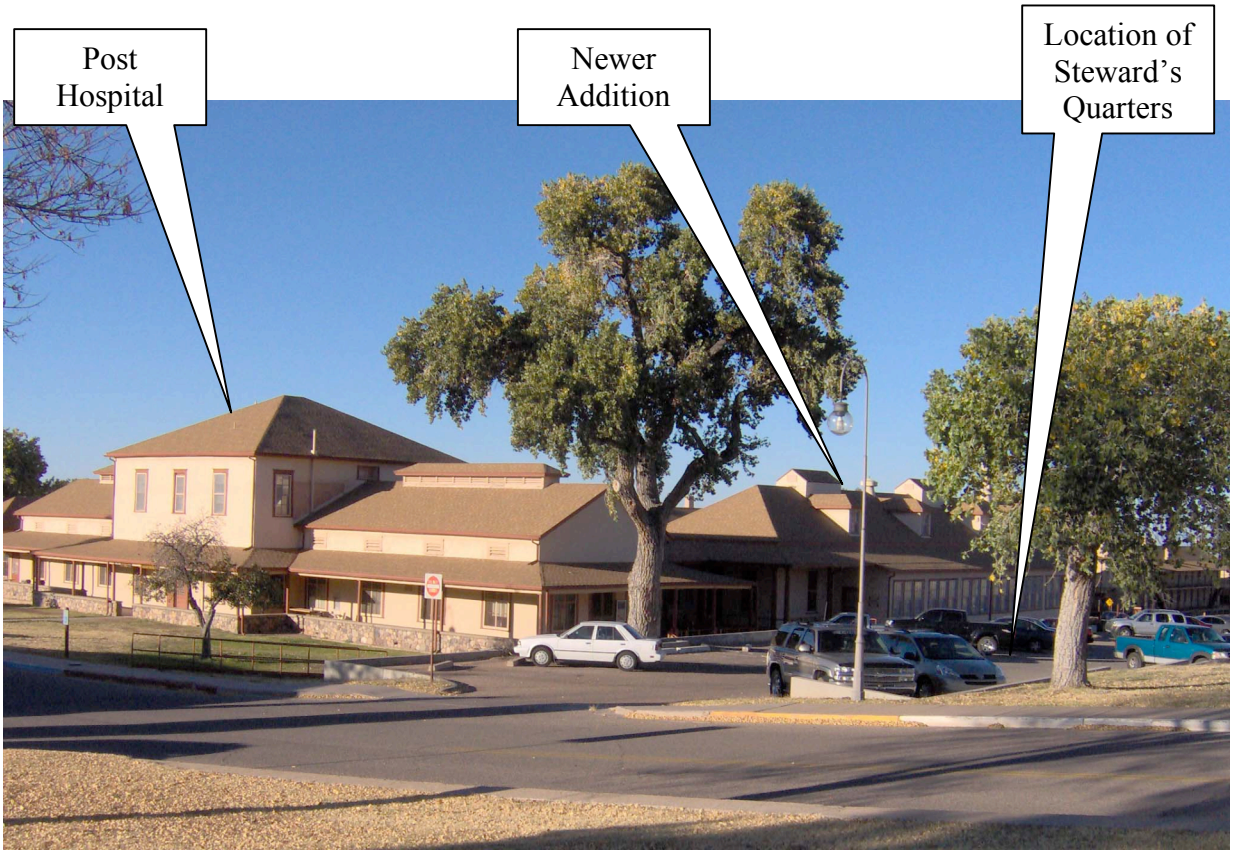


Figure 7. Old Hospital Building, 2006
Source: Author

The location of the Steward's Quarters (Figures 6 and 7) was included in Table 1 because he was the observer for a period of time. Information about the Steward's Quarters is included here to avoid the presumption that the site may have moved. In fact, there was no indication that the observation site ever moved away from the back of the hospital. The hospital is visible on the left side of the image of the Steward's Quarters in Figure 8.

Figure 8. Steward's Quarters, perhaps in 1900
Source: Fort Huachuca Museum

U.S. Army Years 1939–1940

The Weather Bureau completed a Substation History Form 530-1 in 1954. It indicates that weather observations were made about four blocks southeast of the hospital near the "Radio Building." That site was used between 1 December 1939 and 31 May 1940. There was a note that these observations were unofficial. It said that all equipment was the property of the U.S. Army and that the weather station was not officially approved by the Weather Bureau.

There was a note from the Installation Diary, CY 1956 held by the Fort Huachuca Museum that quotes Major John H. Healey, USA retired, that "meteorological records were taken on the Post at a location near the Capt Whiteside School from the year 1900 to 1944. These record were made by the Signal Corps Detachment." That seems to refer to the site near the "Radio Building" but no supporting information was discovered to support the quote.

Fort Huachuca was closed as a military base from 1947 to 1951.

The next observations were after the end of the period considered in this study. They seem to have been made in support of army aviation activities. On 1 September 1954, weather observations were begun at a site 2.8 miles west-northwest of the previous location on the old post and 100 yards southeast of the Aviation Operations Building, near building 11001.

INSTRUMENTATION

Little information exists on the instrumentation at Fort Huachuca during the Surgeon General's network period. However, the type of instruments in use was inferred by the data that was recorded on the observation forms. Those data describe a well-equipped weather station by the Surgeon General standard.

Thermometer

The earliest observations of temperature involved two varieties of thermometers. One was an ordinary thermometer. The Surgeon General published the revised General Meteorological Instructions in 1868. Those instructions emphasized the necessity of proper exposure of the thermometer. It was to be in the open air, under a roof of some kind, sheltered from the direct rays of the sun, away from thick walls or rocks, and mounted vertically about four feet above the a short-grass covered ground. It was to be housed within a louvered box if possible (see the following paragraphs on Shelters).

The calibration of the thermometer was a major concern. Once each year, a test was to be conducted to verify the thermometer's performance in measuring 32˚F.

> This should be done at a time when the temperature of the air is a little above 32˚; in other words, when there is a slight thaw going on in the shade. A vessel is to be filled with wet snow, or with finely broken ice that is beginning to melt, the thermometer to be plunged into it nearly up to the 32˚ mark, and after remaining there for half an hour, to be carefully read. It will not do to have merely some water with a little ice or snow floating in it. . The vessel must contain as much as can be put in of the frozen material, with only enough water to fill up the interstices. The bulb and the lower part of the stem of the thermometer must be surrounded by and in actual contact with the snow or ice.

The amount of error, if any, would be entered each month in the remarks section of the observation form.

The second type of thermometer was the self-registering thermometer, one of the innovations in meteorological observations. It was two J-shaped thermometers each with small wires embedded that acted as index markers for the highest and lowest temperatures since the instrument was reset. These markers moved as the mercury expanded with warming or contracted with cooling and were left in place at their most extreme position. Loomis described a self-registering thermometer (Figure 9) in his Treatise on Meteorology in 1868.

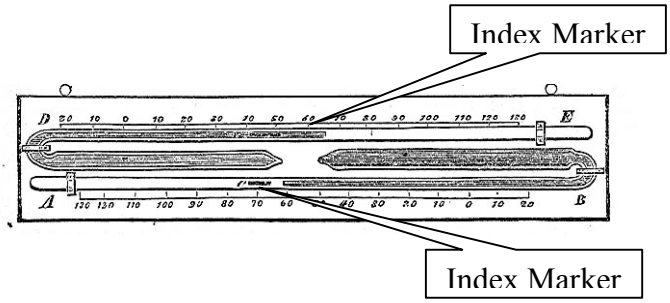


Figure 9. Self-Registering Thermometer
Source: Loomis' Treatise on Meteorology, 1868

During the Weather Bureau years, the maximum and minimum thermometers were probably Green's (Figure 10). They were the standard equipment mentioned in 1906. Instructions for reading and resetting the Green's thermometers were detailed (Figures 11 and 12).

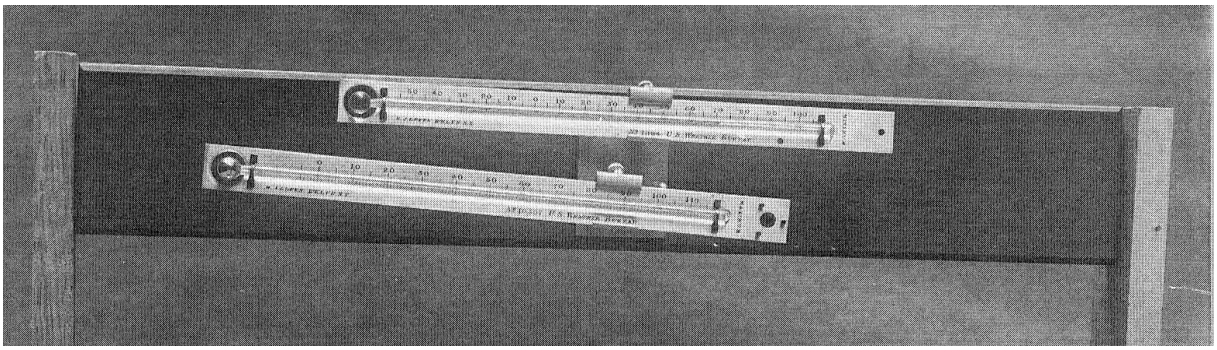
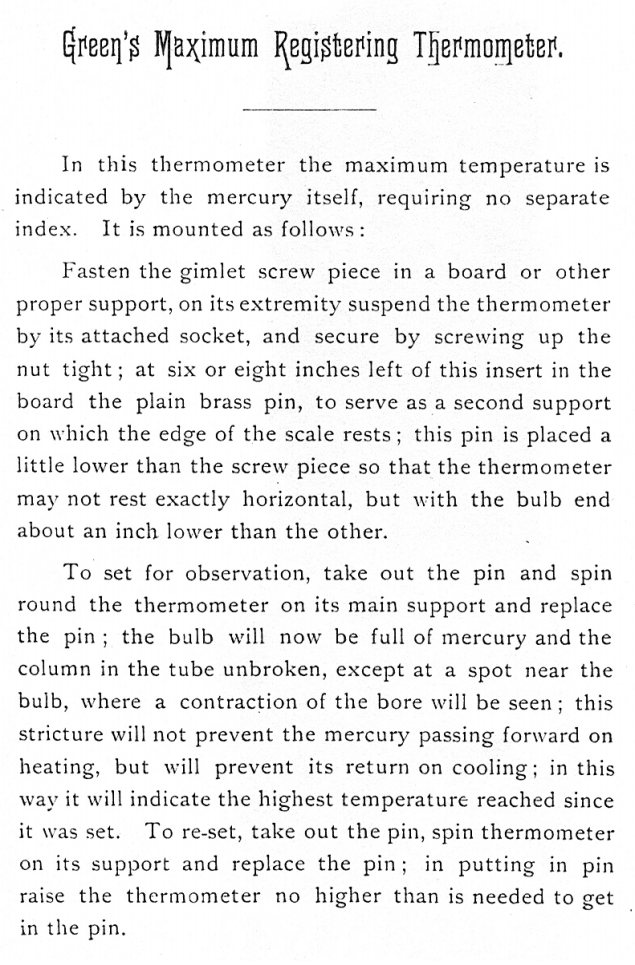


Figure 10. Green Maximum and Minimum Thermometers on a Townsend Mount
Source: National Archives and Records Administration



Green's Maximum Registering Thermometer.

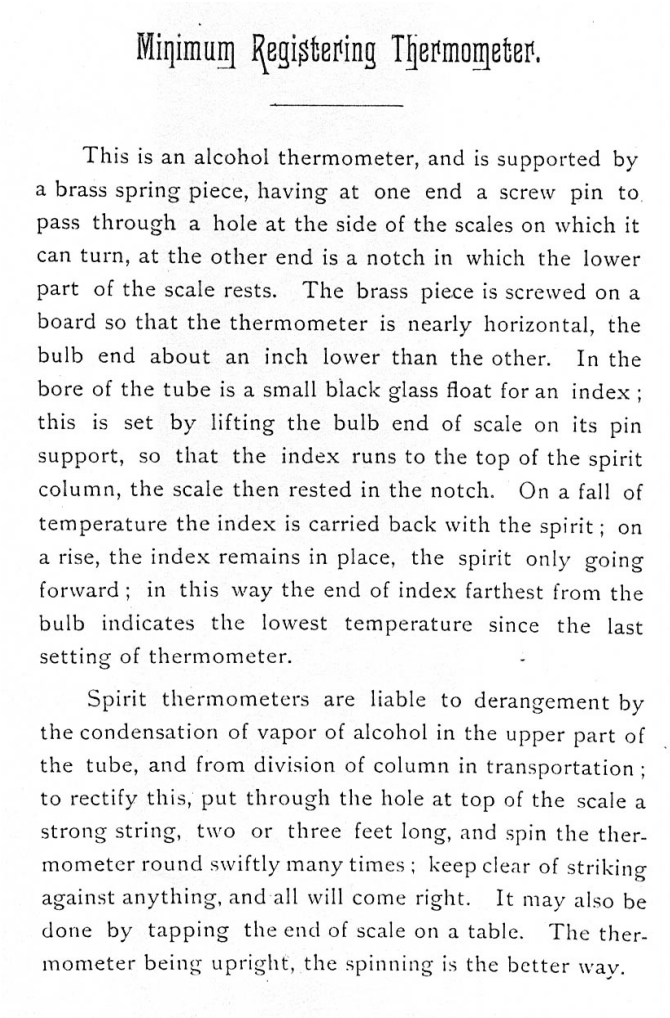
In this thermometer the maximum temperature is indicated by the mercury itself, requiring no separate index. It is mounted as follows:

Fasten the gimlet screw piece in a board or other proper support, on its extremity suspend the thermometer by its attached socket, and secure by screwing up the nut tight; at six or eight inches left of this insert in the board the plain brass pin, to serve as a second support on which the edge of the scale rests; this pin is placed a little lower than the screw piece so that the thermometer may not rest exactly horizontal, but with the bulb end about an inch lower than the other.

To set for observation, take out the pin and spin round the thermometer on its main support and replace the pin; the bulb will now be full of mercury and the column in the tube unbroken, except at a spot near the bulb, where a contraction of the bore will be seen; this stricture will not prevent the mercury passing forward on heating, but will prevent its return on cooling; in this way it will indicate the highest temperature reached since it was set. To re-set, take out the pin, spin thermometer on its support and replace the pin; in putting in pin raise the thermometer no higher than is needed to get in the pin.

Figure 11. Instructions for Green's Maximum Thermometer
Source: Thermometer Record Cincinnati Observatory Sep 1 1882-June 30 1884

On 9 March 1890, the maximum thermometer was reported to have been broken. It was replaced and maximum temperature reported on 1 April 1890



Minimum Registering Thermometer.

This is an alcohol thermometer, and is supported by a brass spring piece, having at one end a screw pin to pass through a hole at the side of the scales on which it can turn, at the other end is a notch in which the lower part of the scale rests. The brass piece is screwed on a board so that the thermometer is nearly horizontal, the bulb end about an inch lower than the other. In the bore of the tube is a small black glass float for an index; this is set by lifting the bulb end of scale on its pin support, so that the index runs to the top of the spirit column, the scale then rested in the notch. On a fall of temperature the index is carried back with the spirit; on a rise, the index remains in place, the spirit only going forward; in this way the end of index farthest from the bulb indicates the lowest temperature since the last setting of thermometer.

Spirit thermometers are liable to derangement by the condensation of vapor of alcohol in the upper part of the tube, and from division of column in transportation; to rectify this, put through the hole at top of the scale a strong string, two or three feet long, and spin the thermometer round swiftly many times; keep clear of striking against anything, and all will come right. It may also be done by tapping the end of scale on a table. The thermometer being upright, the spinning is the better way.

Figure 12. Instructions for Green's Minimum Thermometer
Source: Thermometer Record Cincinnati Observatory Sep 1 1882-June 30 1884

Rain Gauge

In a 1906 description of the site, the rain gauge was located 100 feet from buildings, 20 feet from a picket fence, and one foot above ground. That height indicates that the gauge may have resembled the one shown in Figure 13 that was partially buried in the ground. The Surgeon General's network collaborated with the Smithsonian on many things including observation times and equipment.

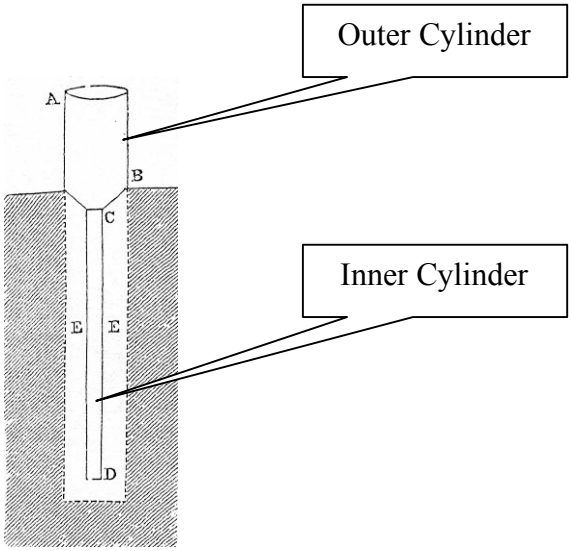


Figure 13. Smithsonian Rain Gauge
Source: Loomis' Treatise on Meteorology, 1868

The description of the observation station at Fort Huachuca in 1917 indicates that the type of rain gauge changed. The gauge was listed as being 38 feet from a building that was 25 feet in height. The top of the gauge was 30 inches above ground. It probably looked like the one in Figure 14.

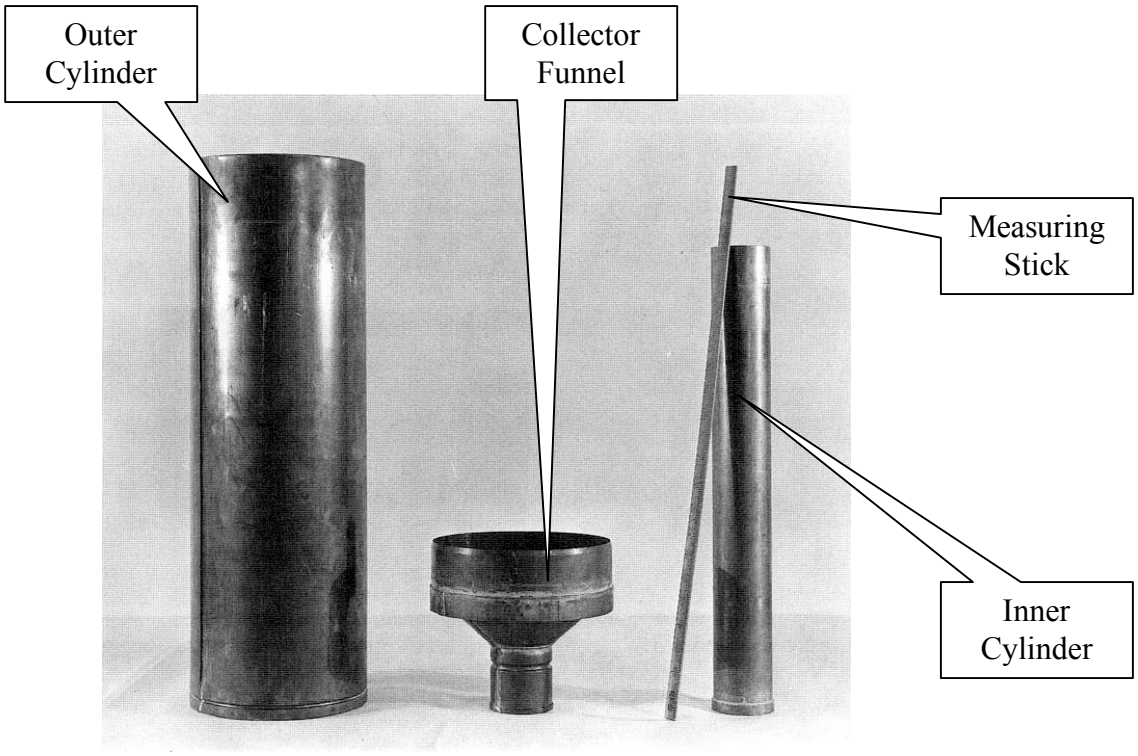


Figure 14. Standard Eight Inch Rain Gauge
Source: National Archives and Records Administration

The funnel of standard rain gage was placed over the inner cylinder and directed the water into it. The area of the top of the funnel was ten times the area of the top of the inner cylinder. Therefore, an inch of rainfall would stand ten inches deep in the inner cylinder. The measuring stick was magnified (in effect) ten times, to an actual length of twenty inches, and was marked in rainfall inches and hundredths of an inch. The inner cylinder and funnel were placed into the outer cylinder. The outer cylinder caught the overflow when the amount was greater than two inches and could be used to catch snowfall in the winter. Some versions of the rain gauge had a wooden frame around it for support.

Shelter

The typical instrument shelter (Figure 15) of the Fort Huachuca era had double-latticed walls and a slatted floor. The height of the of the shelter measured at the gable as 4' 1", its sides were 2' 9" high, the width as 2' 3', and the depth was 1' 11". The thermometers were mounted inside as prescribed by page 5 of the Instructions to Observers.

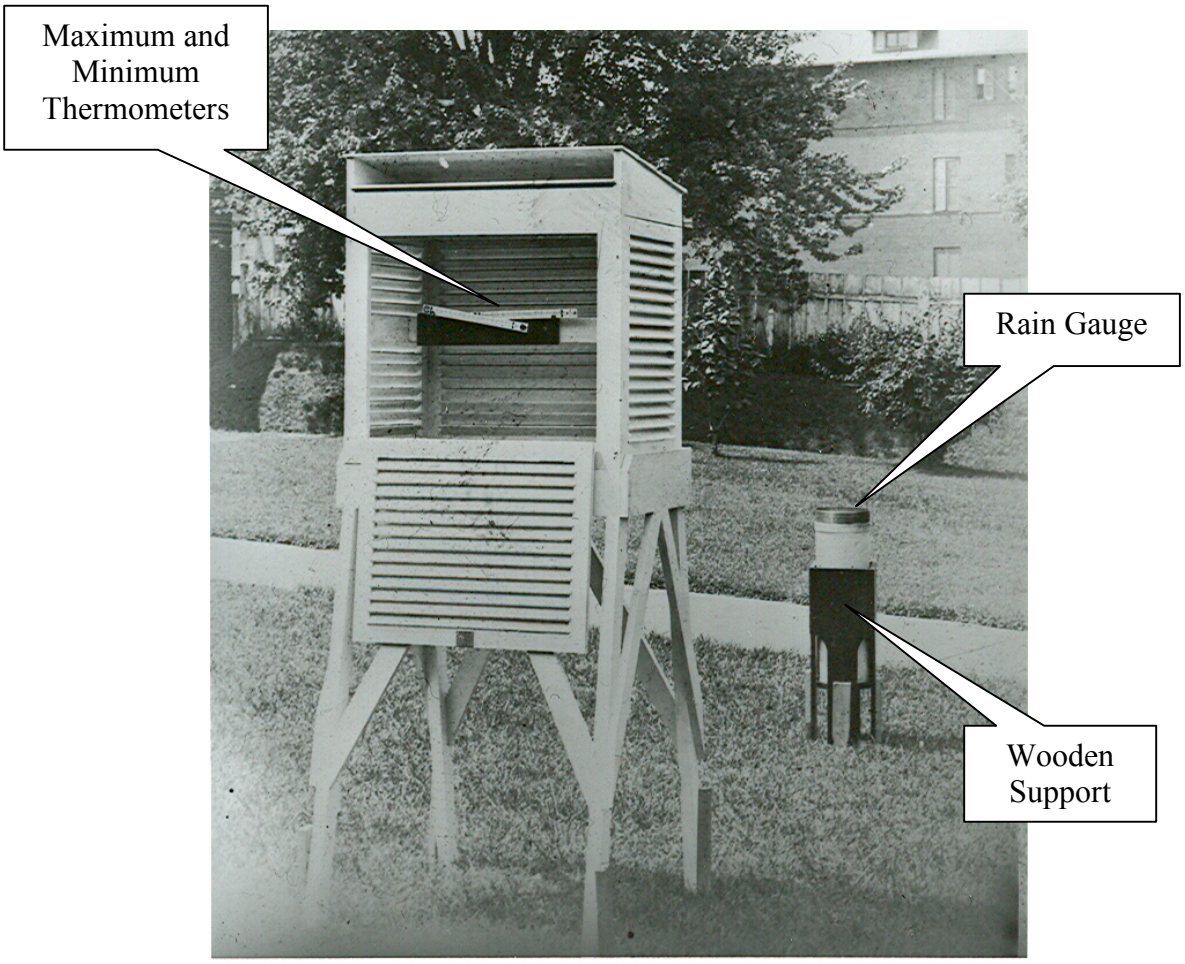


Figure 15. Maximum-Minimum Thermometers in Instrument Shelter, Rain Gauge on Right
Source: Utah Historical Society, J. Cecil Alter Collection, C-102 Box 1

Hygrometer

Entries of dry and wet bulb thermometer were likely made using a hygrometer. One of the most commonly used hygrometer of the early period was the Mason's Hygrometer (Figure 16).

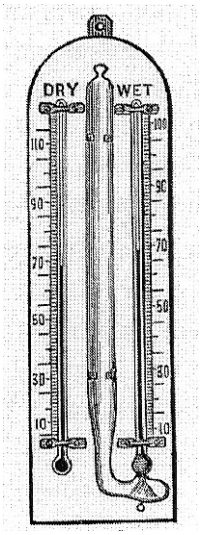


Figure 16. Mason's Hygrometer, 1879
Source: Illustrated Catalogue and Price List of Optical , Meteorological Instruments

The Surgeon General's General Meteorological Instructions of 1868 stated that the stationary hygrometer (like Mason's) was to be placed within the shelter. One problem was assuring that there was a constant supply of moisture to the wick covering the wet bulb. The muslin covering was to be kept "uniformly and sufficiently wet."

The dry and wet bulb readings were used with a table of values to derive the dew point and the relative humidity.

Barometer

The type barometer that was used at Fort Huachuca is unknown. However, the type of aneroid barometer in general use elsewhere by the Signal Service was made by Cassella (Figure 17). Because the reports were being provided to the Signal Service, one presumes it would have been provided to Fort Huachuca.

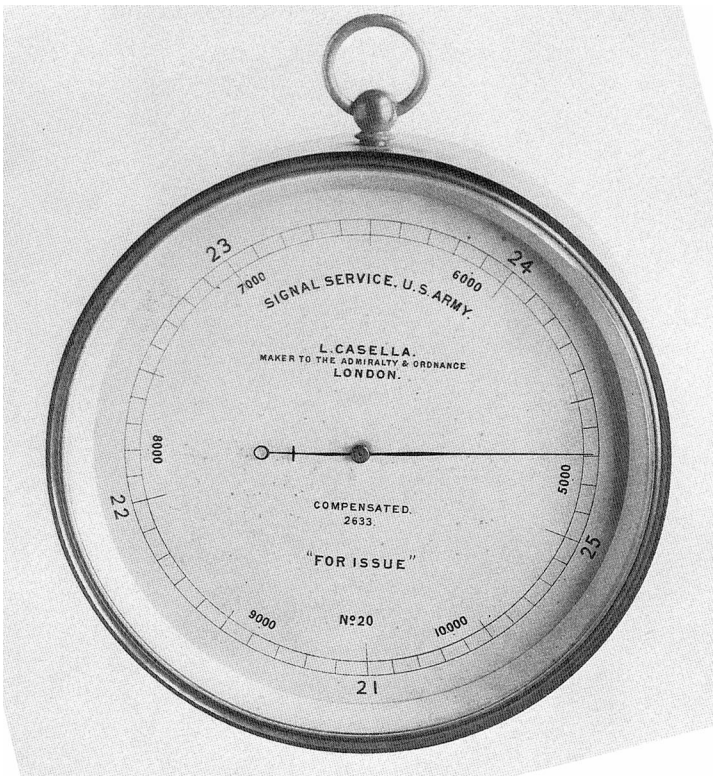


Figure 17. Signal Service Type 1 Aneroid Barometer
Source: National Archives and Records Administration

The Signal Service Instructions for Volunteer Observers (1884) noted that aneroid barometers were not as accurate as the mercurial ones. It also said that aneroids were more liable to failure by rusting or weakening of the springs within.

To that should have been added the danger of breakage. The report for April 1887 has a note, "Aneroid Barometer Broken." The last reading was at 9 p.m. on 13 March 1887.

FORT HUACHUCA OBSERVERS

All of the climate observers at Fort Huachuca were assigned to the Post Hospital and all were army physicians. The surgeons of course accompanied the cavalry on military operations when there was an anticipated need for their medical care. In such absences, other physicians or, if they were not available, the Hospital Steward would perform his duties at the post.

The Army gave the surgeons many non-medical duties too. He was required to keep books on hospital supplies and on the hospital fund; supervise and maintain the post garden; prepare the monthly sanitary report; and twice each day he was required to make meteorological observations that were transmitted to the Surgeon General at the end of the month.

A review of physician ranks and titles would be beneficial before discussing the observers and their achievements.

Ranks and Titles

During the late nineteenth century, physicians entering into the U.S. Army were given both a rank and a title. On 1 January 1861 just before the Civil War began, the medical department consisted of one surgeon general, thirty surgeons and eighty-three assistant surgeons.

Assistant Surgeon

A physician who entered the Army was commissioned in the rank of 1st Lieutenant and given the title of Assistant Surgeon. The word "assistant" did not imply that he was assisting someone; indeed he often was the only physician on a post. In that regard, it is the same as the university faculty title of Assistant Professor.

After three to five years of service, he could be promoted to the rank of Captain. That change in rank did not come with a new title. He would retain the title of Assistant Surgeon.

Acting Assistant Surgeon

Finding physicians for remote or otherwise unattractive posts was difficult as was maintaining the needed number of physicians in the Army. On some occasions, when Army physicians were not available, contracts were made with civilian physicians to provide medical care at the post. In such cases, the contract physician was given he title of Acting Assistant Surgeon but he did not hold any military rank.

Surgeon

When an Army physician was promoted to the rank of Major, he would receive the title of Surgeon. If the physician was promoted to Lt. Colonel and then to Colonel[1], the title of Surgeon would be retained.

[1] In 1861, the highest rank was Major for all except the Surgeon General

Surgeon General

The Surgeon General of the U.S. Army was the title given to the head of the Army medical organization. This title, like the others, was independent of the rank. In April 1862, Congress authorized the rank of Brigadier General for the Surgeon General. The previous Surgeon Generals had held no higher rank than Colonel.

Hospital Stewards

In addition to the physicians at Army posts, there were others who took the weather observations when the physician was unavailable to do so. Occasionally, line officers from the infantry, cavalry, etc., would fill in. At Fort Huachuca, the substitute was the Hospital Steward. The position of Hospital Steward was one of considerable importance according to Smart (1898). Unmarried enlisted men who had served for at least one year were eligible to be transferred to the Hospital Corps as a Private. Even applicants who were graduates in pharmacy or trained as nurses were not excused from the required training in military discipline, nursing, first aid, drill, cooking, pharmacy, clerical work, work in the field, and the care and management of animals. When the recruit was considered to have completed the training, he was sent to some post with duties as an attendant, nurse, or cook depending on his qualifications.

After one year in the Hospital Corps (six months for a pharmacy graduate), those who passed an examination as to moral character, aptitude, and knowledge became eligible for promotion. The required knowledge included the care of the sick, ward management, minor surgery, first aid, and elementary hygiene. If promoted, they would work for a minimum of one year as an Acting Hospital Steward. That period would be followed by another examination. If he showed a more extensive and detailed knowledge of the required topics, he could be appointed as a Hospital Steward.

Each post was authorized a Hospital Steward, or two or more depending on the size of the post. Privates, at a rate of three per one company, four for two companies, and one additional for every additional two companies, were authorized as the Hospital Steward's assistants.

The duties of the Hospital Steward (or acting Steward) were to manage and distribute hospital supplies, to care for hospital property, to compound and administer medicine, to supervise the preparation of food, to maintain hospital discipline, to prepare hospital reports and returns, to supervise his assistants. It was as part of the hospital reports that he made weather observations in the absence of the surgeons.

The Surgeon Observers

For the period 1886 through 1893, the observers were all physicians. Each left their imprint (Figure 18) on the weather observations of Fort Huachuca

Figure 18. Signatures of the Surgeon Observers
Source: National Climatic Data Center Observation Forms

Jan 1886–Mar 1886
Paul Richard Brown, Asst Surgeon

Captain Paul R. Brown made the first weather observations at Fort Huachuca. He was a native of New York. He graduated from Berkshire Medical College in Pittsfield, Massachusetts in 1868 and studied at the College of Physicians and Surgeons at Cornell University for two years thereafter. He entered the Army on 10 November 1874 as an Assistant Surgeon. He served as an Assistant Surgeon at Fort Huachuca from December 1883 to August 1887. Subsequently, he was promoted to Major and Surgeon on 3 December 1891 and retired on 1 October 1897.

The inspection for 1887 mentioned that he was assisted by the Hospital Steward R. C. Van Dorn and two matrons. It also had a note about the climate, "Average temperature 67˚ and extreme 104˚. Rain fall per annum 10.25. Prevailing wind south and south east."

Apr-May 1886
Robert Hall White, Asst Surgeon

Captain Robert Hall White made the observations during April and May 1886. He was born in Virginia but joined the Army from Pennsylvania on 14 May 1867. He was promoted to Major and Surgeon on 14 May 1887. He retired on 6 July 1898.

Jun 1886–Oct 1886
Paul Richard Brown, Asst Surgeon

Dr. Brown resumed the observational duties.

Nov 1886
Charles Field Mason, Asst Surgeon

Captain Charles Field Mason was a Virginian who became an Assistant Surgeon on 5 May 1886. He served from 20 October 1886 to 22 December 1886 at Huachuca. He resigned on 25 March 1887 and reenlisted on 2 July 1888. He was promoted to Major and Surgeon on 5 July 1899.

In 1917, he wrote a book for the sanitary troops of the armed forces (Mason, 1917).

Dec-1886–May 1887
Paul Richard Brown

Dr. Brown resumed the observational duties.

Jun 1887 -Jul 1887
Leonard Wood, Asst Surgeon

1st Lieutenant Leonard Wood made the weather observations during June and July 1887. He was born on 9 October 1860 in Winchester New Hampshire. He graduated from Harvard Medical School in 1884. On 5 January 1886 was an assistant surgeon at Fort Huachuca.

He went with Capt Henry W. Lawton on the pursuit of Geronimo. He received the Medal of Honor for distinguished conduct during the Geronimo campaign. The medal of honor citation follows.

> Voluntarily carried dispatches through a region infested with hostile Indians, making a journey of 70 miles in one night and walking 30 miles the next day. Also for several weeks, while in close pursuit of Geronimo's band and constantly expecting an encounter, commanded a detachment of Infantry, which was then without an officer, and to the command of which he was assigned upon his own request.

The 1st Lieutenant Wood of Fort Huachuca (Figure 19) rose rapidly through the ranks and had many other achievements.

Figure 19. Leonard Wood, 1886
Source: Fort Huachuca Museum

He was as the last personal physician to President William McKinley and his family. During the Spanish-American War, he commanded the 1st Volunteer Cavalry. His second in command was Theodore Roosevelt. The regiment was soon to be known as the “Rough Riders". Brigadier General Wood remained in Cuba after the war and was the Military Governor of Cuba from 1900 to 1902.

In 1910, he was named Chief of Staff of the U.S. Army, the only medical officer to ever hold that position. He advocated military training in colleges and universities and laid the foundation for the Reserve Officer Training Corps.

Following World War I, General Wood was a candidate for the Republican nomination for President. However, the Republican Convention deadlocked. The party chose a compromise candidate, Warren Harding, who went on to win the election in 1920.

Following his retirement in 1921, General Wood was Governor General of the Philippines. He held that position from 1921 to 1927. He died in Boston, Massachusetts on 7 August 1927.

Sep 1887
Peter Joseph Augustine Cleary, Surgeon

Major Peter Joseph Augustine Cleary (Figure 20) entered the observations for September 1887. He was born in Malta and enlisted in the Army on 4 October 1862. He was mustered out 10 August 1865. He was reappointed as an Assistant Surgeon on 9 October 1867. He became a Major and Surgeon on 30 Jan 1883. He served at Fort Huachuca from 5 September 1887 to 25 October 1887.

Figure 20. Peter Joseph Augustine Cleary
Source: Gillette, 1995

After leaving Fort Huachuca, he went to Mount Vernon Barracks about twenty-five miles north of Mobile, Alabama. Apaches were sent there from the Southwest. In January 1891, he

succeeded Assistant Surgeon Walter Reed as the Post Surgeon responsible for the health care of the Apaches, one of whom was Geronimo.

He was promoted to Lt. Colonel and Deputy Surgeon General on 15 November 1897 and to Colonel and Assistant Surgeon General on 4 February 1901.

Oct 1887–Jan 1891
Julius Herman Patzki, Asst Surgeon,

Captain Julius Herman Patzki (Figure 21) made the observations in October 1887 while stationed at Fort Huachuca from 9 September 1887 to 5 February 1891. He signed the observation form as Major and Surgeon on 8 February 1890.

Figure 21. Julius Herman Patzki
Source: Gillette, 1995

He was born in Prussia and entered the Army from Pennsylvania on 11 January 1864. He served as an Assistant Surgeon with the 15th New York Artillery during Civil War. He was mustered out on 22 August 1865 and entered again on 11 November 1867. He was an Assistant Surgeon with Company G, 9th Infantry in 1876 during the battles with the Lakotas in Wyoming, Custer's battle being the most famous. He retired 13 February 1892.

Dr. Patzki was the official gardener of the Post as a normal part of his duties as Post Surgeon. He reported that with the single exception of potatoes, a good supply of vegetables could be grown with a moderate degree of irrigation in the months April through July. His gardens were in Tanner's Canyon, seven miles east of the Post. There was a report that potatoes growing in a free and wild state had been found at the head of that canyon by J. G. Lemmon in 1882.

The 1888 inspection report included, "A meteorological report was kept showing average temperature to be 61.1˚ and extreme heat to be 102.5˚. Rainfall in '87 was 10.42 inches, prevailing wind west and south west."

Feb 1891 – May 1891
Rudolph Gustave Ebert, Asst Surgeon

Captain Rudolph Gustave Ebert was a New Yorker who entered the Army from Oregon as an Assistant Surgeon on 16 June 1880. He signed the meteorological form as Post Surgeon in May 1891. He was promoted to Major and Surgeon on 17 April 1898. He served at Fort from 18 January 1891 to 6 December 1992.

He assisted Major Timothy E. Wilcox in the identification of flora and fauna in the Fort Huachuca area. In particular, he collected plants near San Carlos and in Tanner's Canyon (Britton, 1894).

Jun 1891–
Timothy Erastus Wilcox, Post Surgeon

Major Timothy Erastus Wilcox was the Post Surgeon at Fort Huachuca from 1892 to 1894 and made the weather observations there.

Dr. Wilcox was born in North Litchfield, New York on 26 April 1840. He received an MD degree from Albany Medical College, New York in 1864. He was appointed Assistant Surgeon to the Sixth New York Heavy Artillery on 25 April 1865. He served at Fort Monroe, Virginia in 1866 and treated the prisoner President Jefferson Davis who was held there. He served at the Pine Ridge Agency after the battle of Wounded Knee, was a Lt. Colonel with the Volunteers during the Spanish-American War, was promoted to Colonel and Assistant Surgeon General in 1903, and retired with the rank of Brigadier General in 1904. Dr. Wilcox (Figure 22) is buried in Arlington National Cemetery.

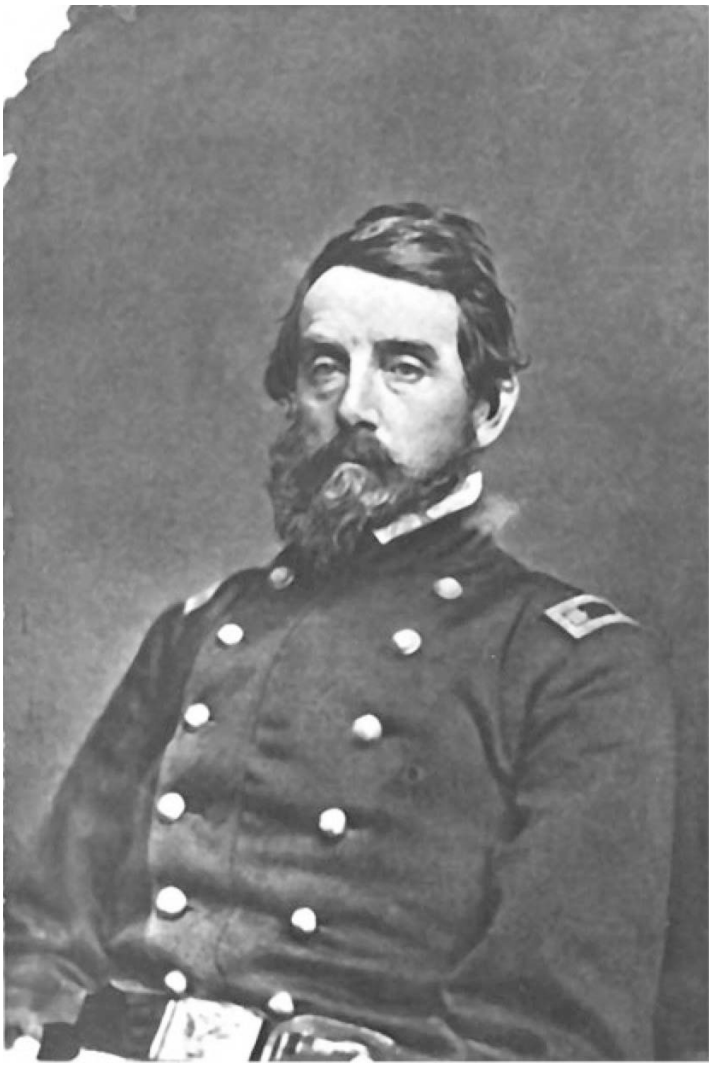


Figure 22. Timothy Erastus Wilcox
Source: Fort Huachuca Museum

While at Fort Huachuca, he joined with Major Edgar Alexander Mearns, a Surgeon stationed at Camp Verde, Arizona in a project to enumerate the flora and fauna of southern Arizona. Dr. Wilcox identified 600 plants. The plant *Tantilla wilcoxi* Stejneger 1902 was named after him, its discoverer. He was the author of notes and papers in both medical and other journals.

Regarding this botanical work, Eggleston (1933) of the Department of Agriculture wrote, "General Wilcox was a born naturalist. Everything was fish to his net—plants, animals, minerals, insects, worms, reptiles, fossils, etc. The National Museum and other museums received many rare specimens from him."

Oct 1893
Capt Rudolph Gustave Ebert, Asst Surgeon

Dr. Ebert filled in for Dr. Wilcox for the weather observations in October 1893. He was on the General Staff of Brig Gen A. McD. McCook in 1891 while serving at Fort Huachuca. He was promoted to Major and Surgeon on 17 April 1898.

Nov 1893–Dec 1893
Timothy Erastus Wilcox, Post Surgeon

Dr. Wilcox resumed the observations in November 1893. He remained at Fort Huachuca until May 1895.

Other Surgeons

For the period 1891 through 1893, the Surgeon General's network operated simultaneously with the new Weather Bureau. It is unclear what the circumstance was during the period 1894 through 1920. It appears that the surgeons phased out as observers and that the hospital stewards and clerks may have taken over. A list of Post Surgeons from 1878 through August 1975 is included as Appendix 2.

Weather Bureau Observers

In 1891, the Weather Bureau was formed within the Department of Agriculture. They assumed control over the previous national weather network operated by the Signal Service, an arm of the Army's Signal Corps. For the next few years, the Surgeon General's network continued to function. At some point that is difficult to pinpoint, the observations from Fort Huachuca became part of the Weather Bureau's Cooperative Observer network.

Nov 1891–
J. W. Stump

Further complicating the situation was the identification of another voluntary observer for the Weather Bureau providing data from "Mt. Huachuca." It seems clear that the location is the Huachuca Mountains. The Great Register of the County of Cochise in 1884 lists a Jonathan W. Stump who was a 30 year-old attorney whose local residence was "Huachuca Mountains." Nothing more definitive could be discovered. Stump's observations continued for several years.

A Weather Bureau visit on 10 March 1906 still identified the observer at the "Post Surgeon." A similar visit on 23 July 1917 identified the observer as the "Hospital Steward" and, on a separate form completed on the same date, as Sergeant William D. Nabors, the Clerk in the Hospital.

In any case, the observers' names beyond these mentioned are unknown.

According to the Weather Bureau's Substation History (Appendix 3) the station was closed because the records were becoming unreliable.

1 Sep 1939–31 May 1940
Sgt G. R. Faulkner

The Weather Bureau Substation History form (Appendix 3) also records a resumption of observations by Sergeant G. R. Faulkner during the period 1 September 1939 through 31 May 1940.

OBSERVATIONS

The climatological records from Fort Huachuca were produced on several different forms and with several different observation instructions. Instrumentation changes allowed or, in some cases dictated, changes in observational data collected. The networks changed as well.

Signal Service Network

A resolution for a national weather network was passed by Congress and signed into law on February 9, 1870 by President Ulysses S. Grant. The seven-line resolution created an agency that would affect the daily lives of most of the citizens of the United States by its evolution to our present day National Weather Service. Its expressed purpose was to develop the capability to forecast storm events by collecting data from a nationwide network of reporting stations.

Considerable structure and organization was necessary and the operation of the new service was dependent on a reliable communication system. The new Signal Service was placed under the Secretary of War because "military discipline would probably secure the greatest promptness, regularity, and accuracy in the required observations." Within the Department of War, it was assigned to the Signal Service Corps (which was organized in 1860) under Brevet Brigadier General Albert J. Myer. General Myer gave this new national weather service its first name: The Division of Telegrams and Reports for the Benefit of Commerce. It would become the Signal Service.

At 7:35 a.m. on November 1, 1870, the first systematized and synchronous meteorological observations were taken by observer-sergeants at 24 stations in the new agency. These observations, which were transmitted by telegraph to the central office in Washington, D.C., were the basis for the first national forecasts.

The Signal Service incorporated reports from the observers from the Smithsonian Institution and, in a cooperative manner, from the Surgeon General's network. The Surgeon General's network began sending copies of their observations to the Signal Service on 19 June 1874, long before observations were made at Fort Huachuca. These Voluntary Observers as they were called played a vital role. Fort Huachuca for example was providing data from a part of the country that was sparsely represented in their data set.

Weather Bureau Network

On 1 October 1890, Congress passed an act that transferred the weather network from the Signal Service to the Weather Bureau newly formed within the Department of Agriculture. The network of voluntary weather observers across the country grew to 2,000 stations by 1891.

The Weather Bureau was transferred from the Department of Agriculture to the Department of Commerce on 1 July 1940.

Fort Huachuca Observations

The first observations on 1 January 1886 were entered on the standard Surgeon General's Meteorological Record form. The form was printed on both sides in a manner that allowed it to be folded into a letter sized document. Mail service was very good, the January 1886 record was received by the Surgeon General on 24 February 1886.

The front side (Figure 23) contained the entries for temperature readings from the thermometer, the estimated wind direction and force, and the observed direction of cloud movement were made at 7 a.m., 2 p.m., and 9 p.m. The maximum and minimum temperatures were read from the registering thermometer once per day in the mornings. The precipitation beginning and ending times were recorded. The quantity of rain and melted snow were entered for each precipitation event.

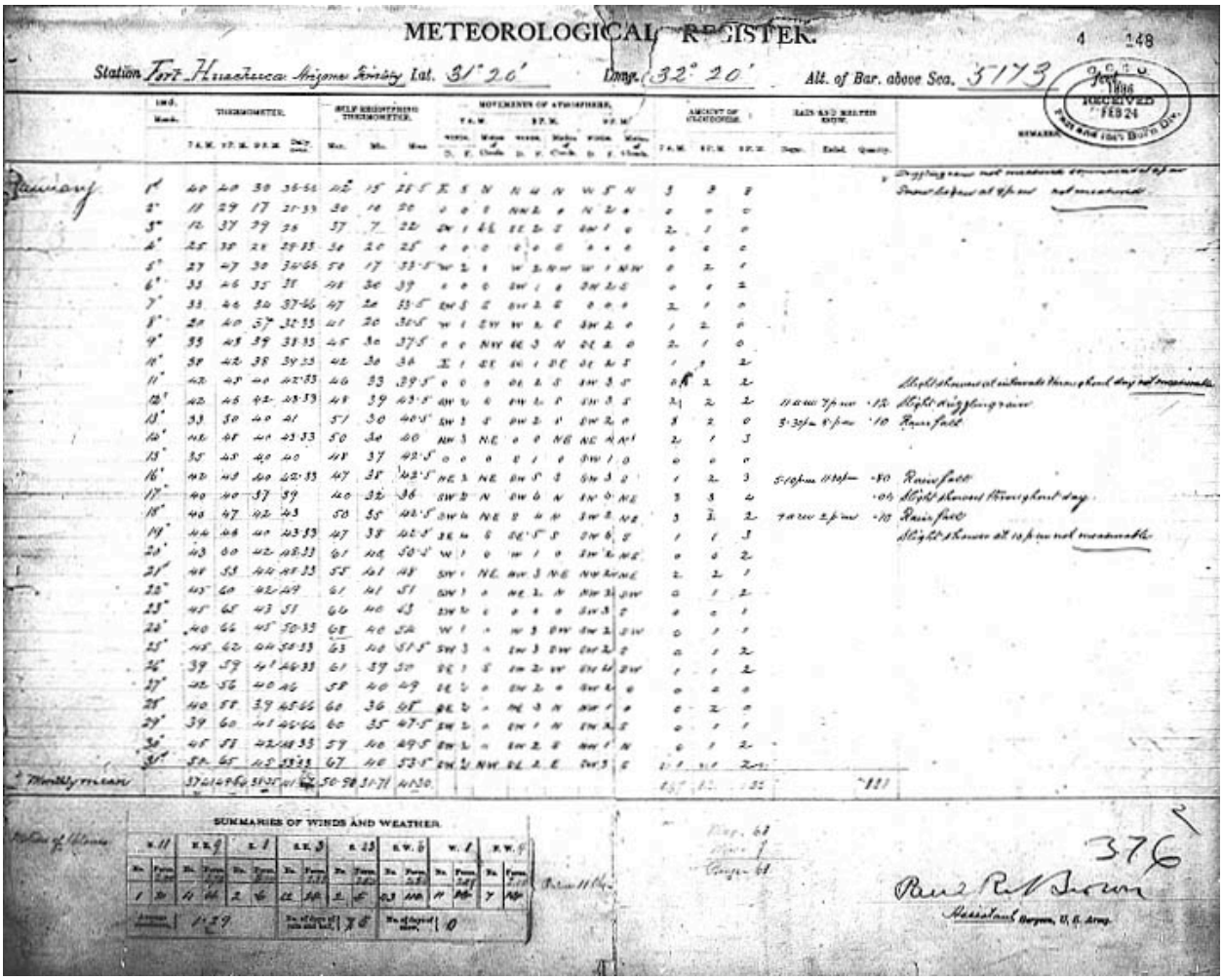


Figure 23. First Observations Form January 1886, Front Side
Source: National Climatic Data Center

Instruments measured the temperature and precipitation amounts. The entries under Movement of Atmosphere were subjective values. The column for winds had two sub-columns labeled D and F. The former was the Direction of the wind. In places like Fort Huachuca that did not have a vane so far as we know, the observer was to determine the direction from which the wind came and to enter one of the sixteen cardinal directions in that column. The column marked F contains the Force of the wind. This value was estimated in one of two ways. First, it would be calculated by observing the horizontal motion of light bodies. For example, a silk handkerchief could be dropped. Its motion could be estimated at a rate of one yard per second equaled two miles per hour. The second method was to consult a table originated by the Meteorological Instruction of the British Admiralty, taken from Loomis' Meteorology text, as modified by the Surgeon General who had added the equivalent velocity in miles per hour (Table 2).

Table 2. Surgeon General's Wind Velocity Estimation

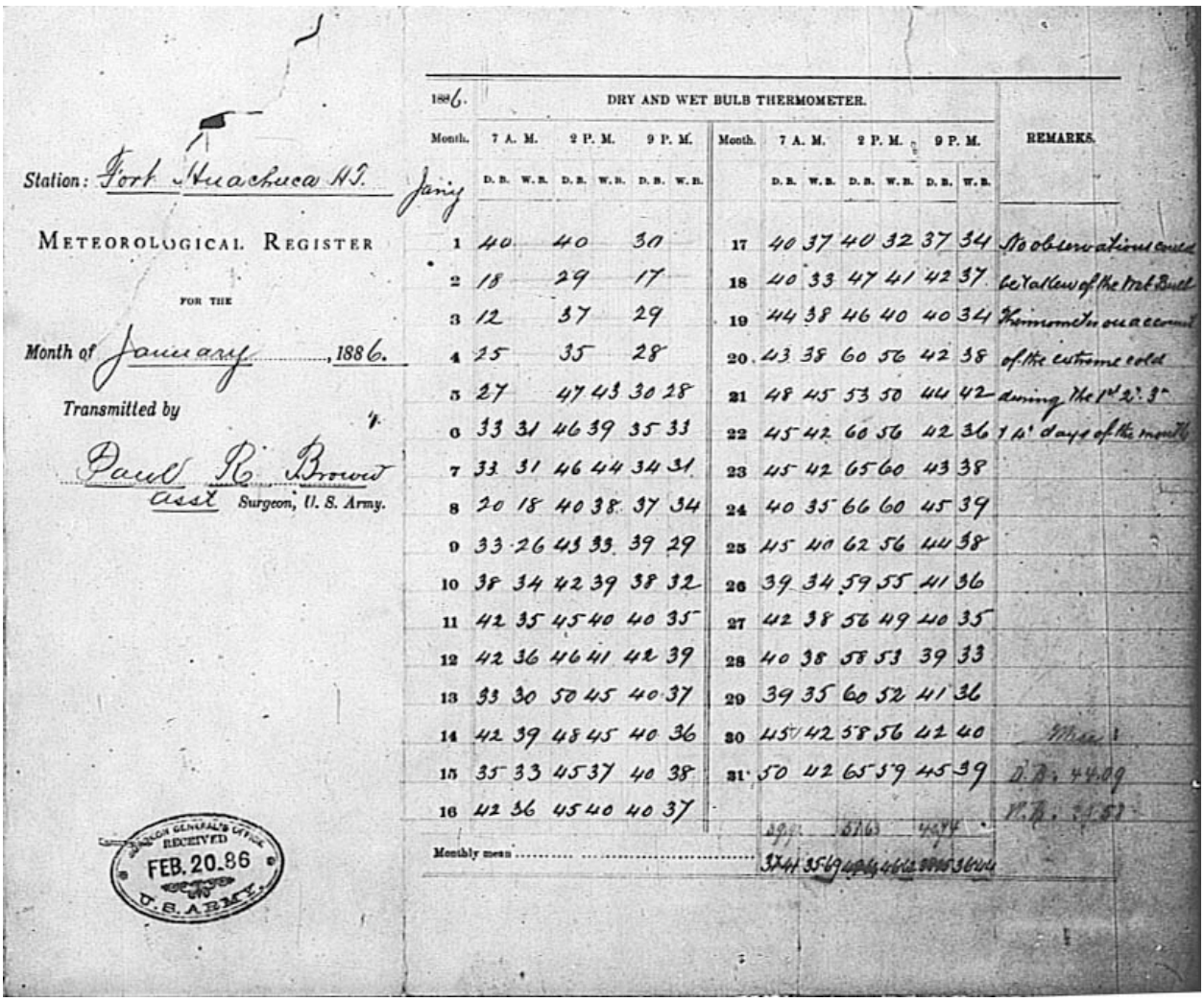
Force	Descriptor	Equivalent MPH
1	Light Air	<5
2	Light Breeze	5–10
3	Light Breeze	10–15
4	Gentle Breeze	15–20
5	Moderate Breeze	20–30
6	Fresh to Stormy Breeze	30–40
7	Moderate Gale	40–50
8	Fresh Gale	50–60
9	Strong Gale to Whole Gale	60–70
10	Storm to Hurricane	>70

The entries in the motion of the clouds columns presented a more complex problem. The movement of the upper air was of great interest because surface winds are more affected by perturbations caused by trees, hills, buildings, etc. The Post Surgeon was instructed to enter the direction from which the lower layer of clouds was moving.

Under the column labeled Amount of Cloudiness, the entries represent total sky coverage in tenths with zero indicating clear sky and 10 indicating total overcast. The observers were cautioned that clouds near the horizon appear to cover more of the sky than they actually do because of foreshortening.

On the back side of the form the wet and dry bulb temperatures were recorded at 7 a.m., 2 p.m., and 9 p.m. The values were read from the hygrometer in the early years and probably by using a psychrometer in the later years. The dry bulb temperature was read from an unaltered thermometer and was the actual temperature of the air. The wet bulb temperature was read from an identical thermometer that had a wet piece of cloth (wick) covering the bulb. Cooling occurred as the water in the wick evaporated. When it cooled to the lowest value possible for the existing humidity, that stabilized temperature was entered in the wet bulb temperature column on the form. Those two values, dry and wet bulb temperatures (Figure 24) both in Fahrenheit, can

be used to determine the dew point and relative humidity from tables developed for those purposes.



Station: Fort Huachuca A.T.

METEOROLOGICAL REGISTER

FOR THE

Month of January, 1886.

Transmitted by

Paul R. Brown
Asst Surgeon, U. S. Army.

1886. DRY AND WET BULB THERMOMETER.

Month.	7 A. M. D.B.	7 A. M. W.B.	2 P. M. D.B.	2 P. M. W.B.	9 P. M. D.B.	9 P. M. W.B.	Month.	7 A. M. D.B.	7 A. M. W.B.	2 P. M. D.B.	2 P. M. W.B.	9 P. M. D.B.	9 P. M. W.B.	REMARKS.
Jany														
1	40		40		30		17	40	37	40	32	37	34	No observations owing
2	18		29		17		18	40	33	47	41	42	37	to failure of the Mk Bulb
3	12		37		29		19	44	38	46	40	40	34	Thermometer on account
4	25		35		28		20	43	38	60	56	42	38	of the extreme cold
5	27		47	43	30	28	21	48	45	53	50	44	42	during the 1st 2d 3d
6	33	31	46	39	35	33	22	45	42	60	56	42	36	4th days of the month
7	33	31	46	44	34	31	23	45	42	65	60	43	38	
8	20	18	40	38	37	34	24	40	35	66	60	45	39	
9	33	26	43	33	39	29	25	45	40	62	56	44	38	
10	38	34	42	39	38	32	26	39	34	59	55	41	36	
11	42	35	45	40	40	35	27	42	38	56	49	40	35	
12	42	36	46	41	42	39	28	40	38	58	53	39	33	
13	33	30	50	45	40	37	29	39	35	60	52	41	36	
14	42	39	48	45	40	36	30	45	42	58	56	42	40	Mean
15	35	33	45	37	40	38	31	50	42	65	59	45	39	D.B. 44.09
16	42	36	45	40	40	37								W.B. 37.87
Monthly mean								37.41	35.9					

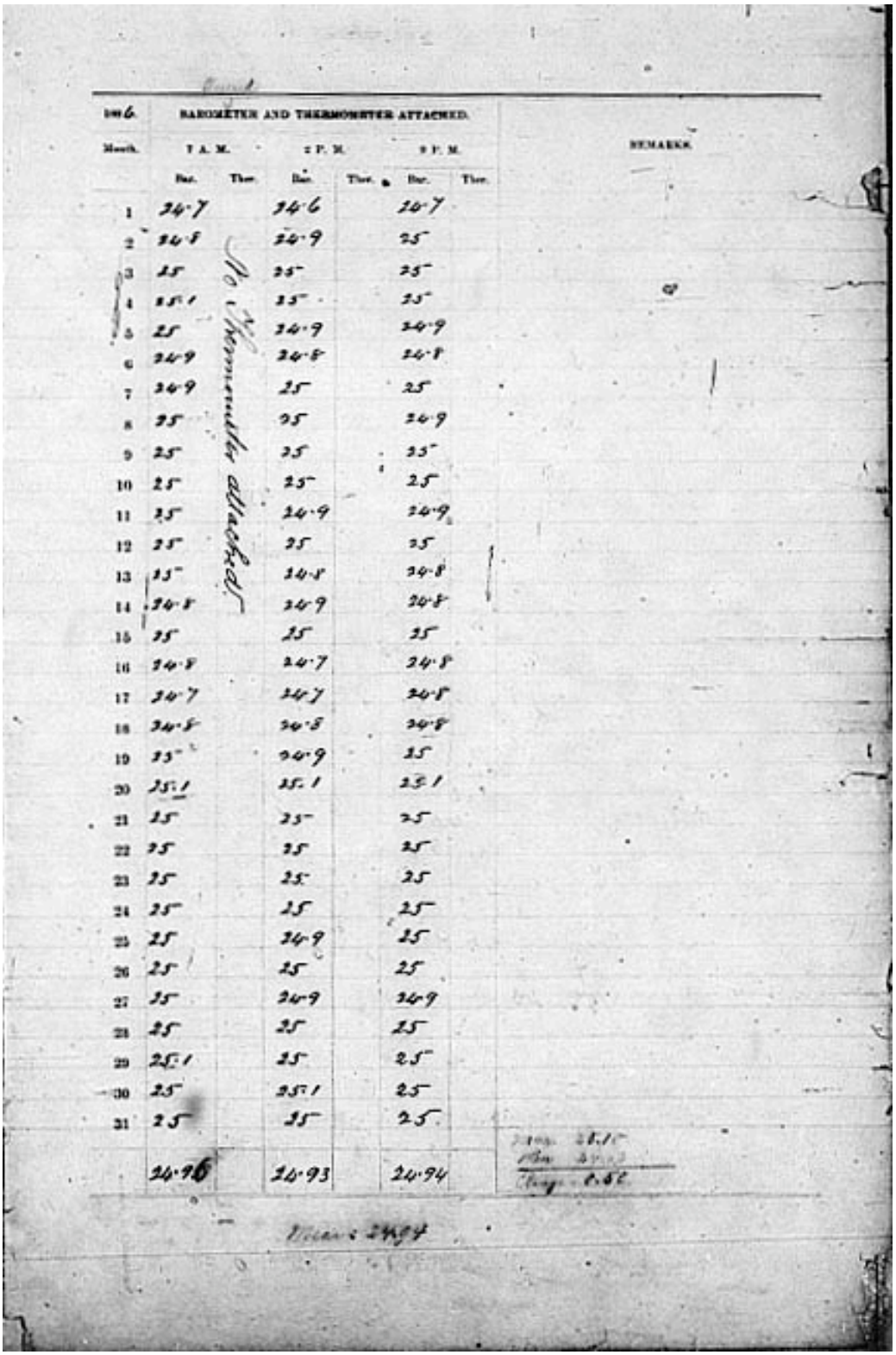
SURGEON GENERAL'S OFFICE RECEIVED FEB. 20. 86 U.S. ARMY

Figure 24. First Observations Form January 1886, Back Side, Dry and Wet Thermometers
Source: National Climatic Data Center

The barometer reading were recorded at 7 a.m., 2 p.m., and 9 p.m. and entered on the back of the form too. Those values were given in inches of mercury that were read from an aneroid barometer (Figure 17). The values entered were the Station Pressures. That term referred to pressure readings that were not corrected for the difference in pressure caused by the altitude[2]. The values ranged from a low of 24.7 to a high of 25.1 inches of mercury[3].

[2] Pressure always lowers as altitude rises

[3] Using the standard atmosphere, add 5.10 inches to the Fort Huachuca readings to convert to the sea level pressures now in use.



1886. BAROMETER AND THERMOMETER ATTACHED.

Month.	7 A. M.		2 P. M.		9 P. M.		REMARKS.
	Bar.	Ther.	Bar.	Ther.	Bar.	Ther.	
1	24·7		24·6		24·7		
2	24·8		24·9		25		
3	25		25		25		
4	25·1		25		25		
5	25		24·9		24·9		
6	24·9		24·8		24·8		
7	24·9		25		25		
8	25		25		24·9		
9	25		25		25		
10	25		25		25		
11	25		24·9		24·9		
12	25		25		25		
13	25		24·8		24·8		
14	24·8		24·9		24·8		
15	25		25		25		
16	24·8		24·7		24·8		
17	24·7		24·7		24·8		
18	24·8		24·8		24·8		
19	25		24·9		25		
20	25·1		25·1		25·1		
21	25		25		25		
22	25		25		25		
23	25		25		25		
24	25		25		25		
25	25		24·9		25		
26	25		25		25		
27	25		24·9		24·9		
28	25		25		25		
29	25·1		25		25		
30	25		25·1		25		
31	25		25		25		
	24·96		24·93		24·94		

Mean 24·94

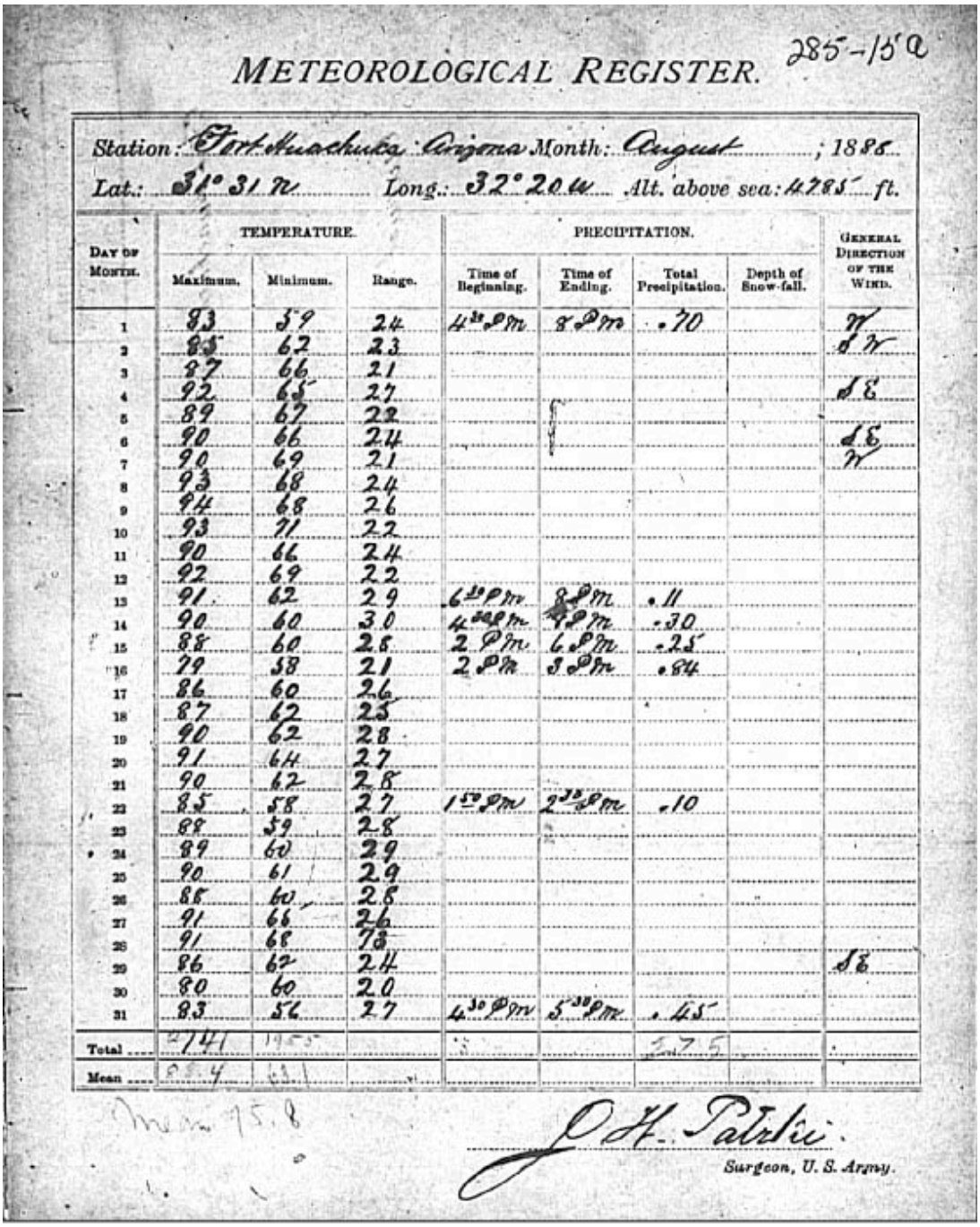
Figure 25. First Observations Form January 1886, Back Side, Barometer Readings
Source: National Climatic Data Center

From the beginning at Fort Huachuca, the observation forms were sent to the Surgeon General's office. They were officially part of the Surgeon General's network of weather stations. That office, in turn, forwarded them to the Office of the Chief Signal Officer. Figure 26 shows the stamps that recorded receipt of the February 1866 form by the Surgeon General's Office on 15 March 1886. The Office of the Chief Signal Officer received the forwarded form on 7 April 1866. In effect, the surgeons were volunteer observers for the Army's Signal Service.

Figure 26. Receipt Stamps on Weather Observations for February 1886
Source: National Climatic Data Center

On 13 March 1887, the barometer readings ended when the aneroid barometer was broken. There was a note on the March 1888 form that the barometer had been forwarded to the Surgeon General's Office for repair. In July 1888, the barometer readings were entered again, presumably with the repaired barometer. The following month a new form did not include space for a barometer reading.

In August 1888, a new form (Figure 27) was placed into use by the Surgeon General's network. Only one side of this form was used for entries and only the maximum and minimum temperatures, precipitation beginning and ending times, precipitation amounts, and general direction of the wind were reported.



METEOROLOGICAL REGISTER. 285-15a

Station: Fort Huachuca Arizona Month: August ; 1888

Lat.: 31° 31 N. Long.: 32° 20 W. Alt. above sea: 4785 ft.

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	93	59	24	4:30 PM	8 PM	.70		W
2	85	62	23					S W
3	87	66	21					
4	92	65	27					S E
5	89	67	22					
6	90	66	24					S E
7	90	69	21					W
8	93	68	24					
9	94	68	26					
10	93	71	22					
11	90	66	24					
12	92	69	22					
13	91	62	29	6:30 PM	8 PM	.11		
14	90	60	30	4:30 PM	9 PM	.30		
15	88	60	28	2 PM	6 PM	.25		
16	79	58	21	2 PM	8 PM	.84		
17	86	60	26					
18	87	62	25					
19	90	62	28					
20	91	64	27					
21	90	62	28					
22	85	58	27	1:30 PM	2:30 PM	.10		
23	88	59	28					
24	89	60	29					
25	90	61	29					
26	85	60	28					
27	91	66	26					
28	91	68	73					
29	86	62	24					S E
30	80	60	20					
31	83	56	27	4:30 PM	5:30 PM	.45		
Total	2741	1955				3.75		
Mean	88.4	63.1						

Mean 75.8

J. H. Patzki.
Surgeon, U. S. Army.

Figure 27. New Observation Form, August 1888
Source: National Climatic Data Center

In January 1890, the form being used was the Surgeon General's Form 34. The only change to the form from the previous one was the addition of the form number. This form remained in use through 1893.

Arizona Weather Service

As early as 1883, state weather services were organized by the Signal Service. The purpose was to aid in collecting weather data and distributing weather warning to the agricultural communities. Their Bulletin No 2 for November 1891 (Figure 28), typewritten and in ink, shows both the stations and the observers. Note that some observations from out of state were included (e.g., Abilene, El Paso, Los Angeles, Santa Fe). Note the entries for Mt. Huachuca.

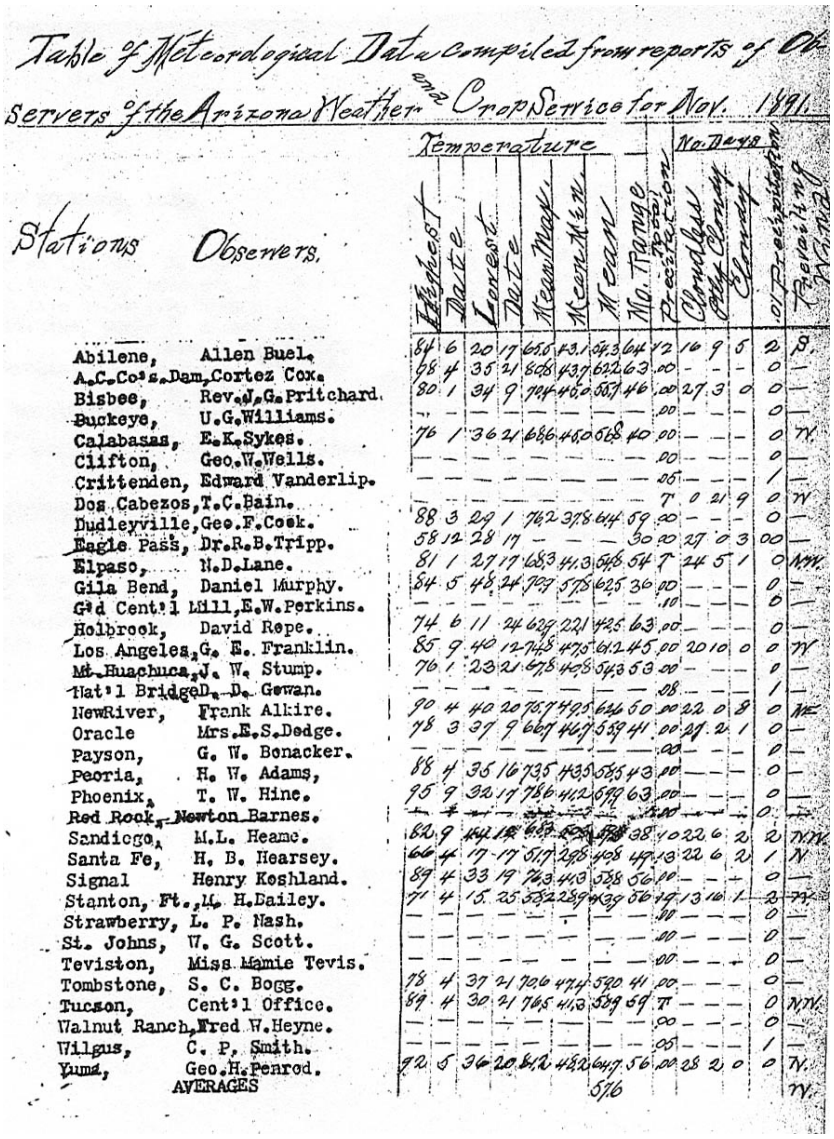


Table of Meteorological Data compiled from reports of Observers of the Arizona Weather and Crop Service for Nov. 1891.

Stations	Observers.
Abilene,	Allen Buel.
A.C.Co's.Dam,	Cortez Cox.
Bisbee,	Rev.J.G.Pritchard.
Buckeye,	U.G.Williams.
Calabasas,	E.K.Sykes.
Clifton,	Geo.W.Wells.
Crittenden,	Edward Vanderlip.
Dos Cabezos,	T.C.Bain.
Dudleyville,	Geo.F.Cook.
Eagle Pass,	Dr.R.B.Tripp.
Elpaso,	N.D.Lane.
Gila Bend,	Daniel Murphy.
Gild Cent'l Mill,	E.W.Perkins.
Holbrook,	David Rope.
Los Angeles,	G. E. Franklin.
Mt. Huachuca,	J. W. Stump.
Nat'l Bridge,	D. Gewan.
NewRiver,	Frank Alkire.
Oracle	Mrs.E.S.Dodge.
Payson,	G. W. Bonacker.
Peoria,	H. W. Adams,
Phoenix,	T. W. Hine.
Red Rock,	Newton Barnes.
Sandiego,	M.L. Heame.
Santa Fe,	H. B. Hearsey.
Signal	Henry Koshland.
Stanton, Ft.,	H. Dailey.
Strawberry,	L. P. Nash.
St. Johns,	W. G. Scott.
Teviston,	Miss Mamie Tevis.
Tombstone,	S. C. Bogg.
Tucson,	Cent'l Office.
Walnut Ranch,	Fred W.Heyne.
Wilgus,	C. P. Smith.
Yuma,	Geo.H.Penrod.
	AVERAGES

Stations	Temperature: Highest	Date	Lowest	Date	Mean Max.	Mean Min.	Mean	Mo. Range	Precipitation	No. Days: Cloudless	Fair	Cloudy	Of Precipitation	Prevailing Winds
Abilene,	84	6	20	17	65.6	43.1	54.3	64	.12	16	9	5	2	S.
A.C.Co's.Dam,	68	4	35	21	56.8	43.7	62.2	63	.00	-	-	-	0	—
Bisbee,	80	1	34	9	70.4	46.0	58.7	46	.00	27	3	0	0	—
Buckeye,	-	-	-	-	-	-	-	-	.00	-	-	-	0	—
Calabasas,	76	1	36	21	66.6	46.0	56.8	40	.00	-	-	-	0	N.
Clifton,	-	-	-	-	-	-	-	-	.00	-	-	-	0	—
Crittenden,	-	-	-	-	-	-	-	-	.05	-	-	-	1	—
Dos Cabezos,	-	-	-	-	-	-	-	-	.T	0	21	9	0	N
Dudleyville,	88	3	29	1	76.2	37.8	64.4	59	.00	-	-	-	0	—
Eagle Pass,	58	12	28	17	-	-	-	30	.00	27	0	3	00	—
Elpaso,	81	1	27	17	68.3	41.3	54.8	54	.T	24	5	1	0	NW.
Gila Bend,	84	5	48	24	79.7	57.5	68.6	36	.00	-	-	-	0	—
Gild Cent'l Mill,	-	-	-	-	-	-	-	-	.10	-	-	-	0	—
Holbrook,	74	6	11	24	62.9	22.1	42.5	63	.00	-	-	-	0	—
Los Angeles,	85	9	40	12	74.8	47.0	61.2	45	.00	20	10	0	0	W
Mt. Huachuca,	76	1	23	21	67.8	40.5	54.3	53	.00	-	-	-	0	—
Nat'l Bridge,	-	-	-	-	-	-	-	-	.08	-	-	-	1	—
NewRiver,	90	4	40	20	76.7	49.5	64.6	50	.00	22	0	8	0	NE
Oracle	78	3	37	9	66.7	44.7	55.9	41	.00	29	2	1	0	—
Payson,	-	-	-	-	-	-	-	-	.00	-	-	-	0	—
Peoria,	88	4	35	16	73.5	43.5	58.5	43	.00	-	-	-	0	—
Phoenix,	95	9	32	17	78.6	41.2	59.9	63	.00	-	-	-	0	—
Red Rock,	-	-	-	-	-	-	-	-	.00	-	-	-	0	—
Sandiego,	82	9	44	18	66.3	42.4	54.3	38	.40	22	6	2	2	NW.
Santa Fe,	66	4	17	17	51.7	29.8	40.8	47	.13	22	6	2	1	N
Signal	89	4	33	19	74.3	44.3	59.3	56	.00	-	-	-	0	—
Stanton, Ft.,	71	4	15	25	55.2	25.9	40.6	56	.49	13	16	1	2	W
Strawberry,	-	-	-	-	-	-	-	-	.00	-	-	-	0	—
St. Johns,	-	-	-	-	-	-	-	-	.00	-	-	-	0	—
Teviston,	-	-	-	-	-	-	-	-	.00	-	-	-	0	—
Tombstone,	78	4	37	21	72.6	47.4	59.0	41	.00	-	-	-	0	—
Tucson,	89	4	30	21	76.5	41.3	58.9	69	.T	-	-	-	0	NW.
Walnut Ranch,	-	-	-	-	-	-	-	-	.00	-	-	-	0	—
Wilgus,	-	-	-	-	-	-	-	-	.05	-	-	-	1	—
Yuma,	92	5	36	20	84.2	48.2	64.7	56	.00	28	2	0	0	N.
AVERAGES							57.6							NW.

Figure . Climate Data November 1891
Source: National Climatic Data Center

The data submitted from J. W. Stump for Mt. Huachuca was not a substitute for Fort Huachuca. According to the Great Register of the County of the County of Cochise, Territory of Arizona for

the year 1884, J. Stump was an attorney from the Huachuca Mountains. The location of his observation site could not be ascertained.

The United States Weather Bureau was authorized by an act of Congress o 1 October 1890 as the official national weather network. Many of the Observer Sergeants of the Signal Service transferred to the Weather Bureau on 1 July 1891 and the dissolution of the Signal Service weather network was then complete. The Surgeon General's network continued for a while.

The Fort Huachuca observation forms were forwarded to the Surgeon General through the Director of the Arizona Weather and Crop Service at Tucson beginning in March 1892. On the June 1892 report of the Arizona Weather Service, data from both J. W. Stump at Mt Huachuca and the Post Surgeon at Fort Huachuca were included.

In 1895, the control of all the State Weather Services was placed under the Weather Bureau.

Weather Bureau

The incorporation of a large number of voluntary observers into a single network rapidly changed the nature of weather observations. The Post Surgeons at Fort Huachuca became Cooperative Observers and forwarded their reports to the Weather Bureau until 31 March 1920 when observations at the Fort were discontinued.

The observations were begun again on 1 December 1939 in association with aviation activities. However, the U.S. Army furnished all the equipment and the station and its data were not approved officially by the Weather Bureau.

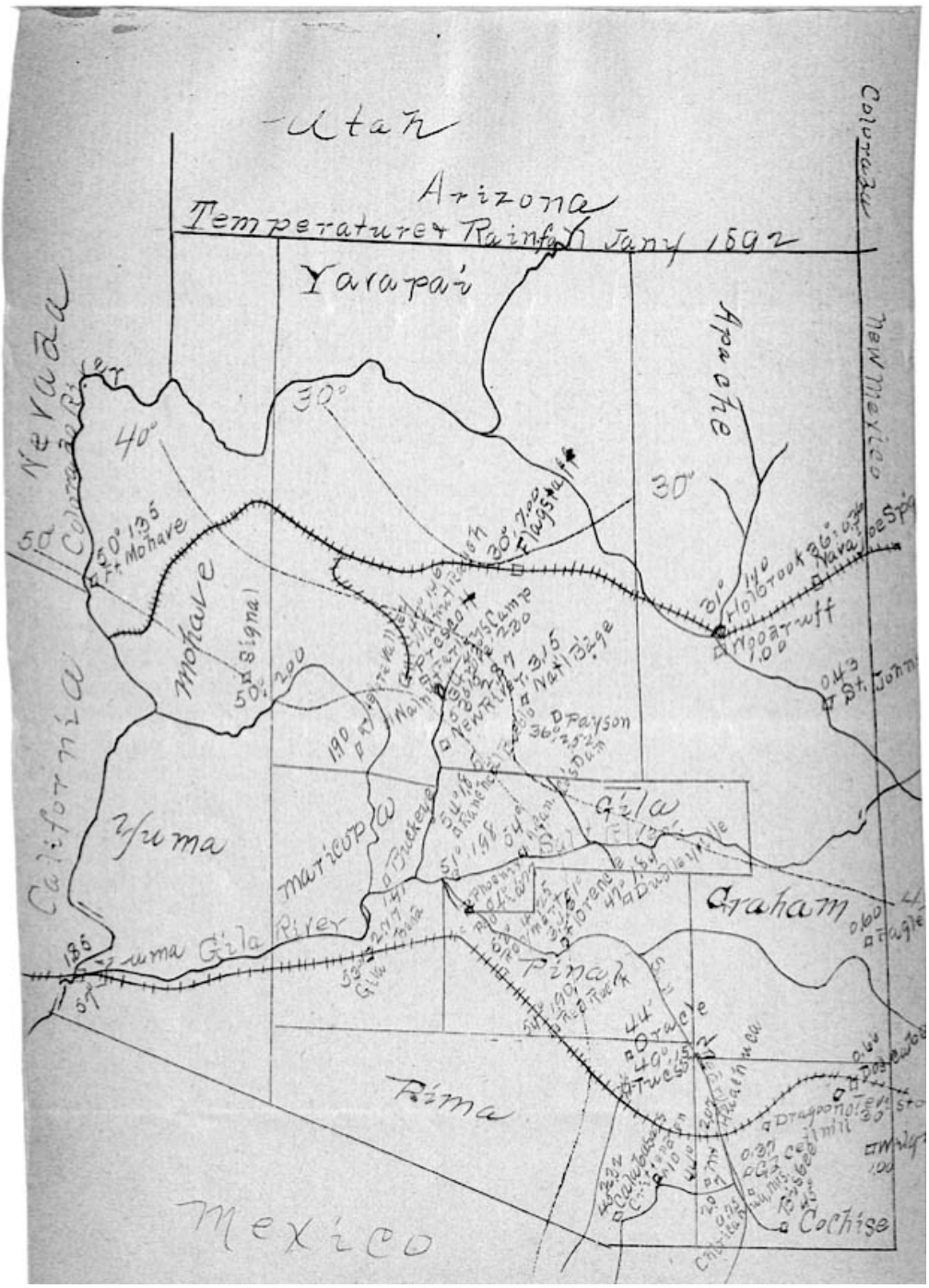
Thus ended Fort Huachuca's weather observations for the period of this study. The data that were produced provide an important record of pre-development southern Arizona. It will become a reliable dataset for researchers trying to unravel past climate and its natural variability to better identify changes when they occur.

The Digital Record

The Fort Huachuca observational data have been digitized for the years 1900 through 1920. The period 1954 through 1981 also is available in digital form. In the digital records identify Fort Huachuca with the station number 023120.

APPENDIX 1

Arizona Observation Sites
January 1892



Source: Arizona Weather Service Bulletin No. 4

APPENDIX 2

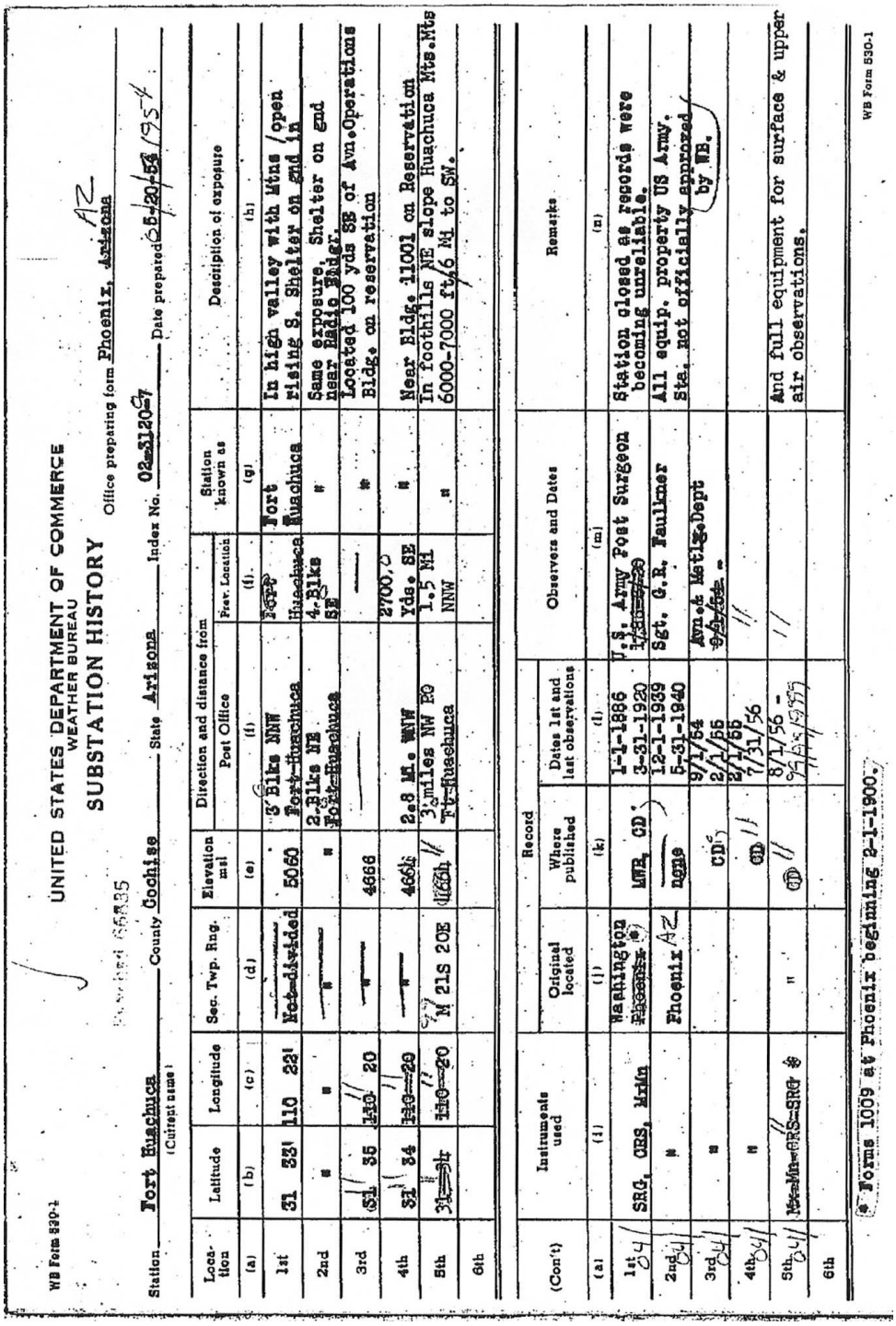
HOSPITAL COMMANDING OFFICERS

Feb 1878	- Sep 1878	A.A.S.	Lightburne, R.E.
Oct 1878	- Dec 1878	A.A.S.	Strom, J.H.
Jan 1879	- Sep 1880	1LT	Gardiner, J. de B.W.
Oct 1880	- Feb 1881	A.A.S.	Minor, John F.
Mar 1881	- Dec 1881	A.A.S.	Trenor, Eustace
Apr 1882	-	CPT	Gardiner, J. de B.W.
Dec 1883	- Aug 1887	CPT	Brown, Paul R.
Sep 1887	- Feb 1891	CPT & MAJ	Patzki, Julius H.
Feb 1891	- May 1895	MAJ	Wilcox, Timothy E.
Jun 1895	- Oct 1895	CPT	Johnson, Richard W.
Oct 1895	- Mar 1898	CPT	Wakemen, William J.
Mar 1898	- Jun 1898	MAJ	Gray, William W.
Jun 1899	- Aug 1901	Contr. Surg.	Dixon, Arch
Feb 1903	-	Contr. Surg.	Watkins, Victor E.
Sep 1902	- Sep 1904	CPT	Wimter, Francis A.
Oct 1904	- Oct 1906	CPT	Webb, Walter D.
Oct 1906	- Oct 1907	Contr. Surg.	Brewer, Isaac W.
Nov 1907	- Feb 1909	CPT	Porter, Ralph S.
Mar 1909	- Jun 1909	1LT	Baker, Cjarles S.
Jun 1909	- Jan 1911	CPT	Howell, Park
Feb 1911	- Jun 1911	CPT	Mabee, James I.
Jul 1911	- Dec 1911	MAJ	Brownlee, Charles Y.
Jan 1912	- Jun 1914	MAJ	O'Connor, R.P.
Jul 1914	- Jun 1916	MAJ	Marrow, Charles E.
Jul 1916	- Nov 1916	CPT	Warner, Benjamin J.
Jan 1917	- Apr 1917	MAJ	Marrow, Charles E.
Sep 1917	- Nov 1917	MAJ	Barber, John R.
Jan 1918	- Feb 1918	CPT	Racer, Floyd H.
Mar 1918	- Jul 1918	MAJ	McCown, Thomas B.
Aug 1918	- Jul 1919	MAJ	Hayes, Daniel J.
Aug 1919	- Apr 1920	MAJ	Hewitt, John E.
May 1920	- Aug 1920	MAJ	Hogan, David D.
Sep 1920	- Jun 1923	MAJ	Norvell, Bonaparte P.
Jan 1924	- Apr 1926	MAJ	Baker, Willis P.
May 1926	- Sep 1927	MAJ	Gutherie, W.G.
Jul 1928	-	CPT	Wolfe, R.C.
Aug 1928	- May 1934	MAJ	Conner, H.L.
Jun 1934	-	MAJ	Villars, H.S.
Nov 1936	-	CPT	Lavery, H.B.
Aug 1937	- Apr 1940	LTC	Norris, S.R.
May 1940	- May 1941	LTC	Beringer, L.E.
Jun 1941	- Nov 1941	LTC	Cantrell, William B.
Jan 1942	- Oct 1945	COL	Maynard, E.B.
31 Jan 1946 Fort Huachuca was placed on inactive status			
Aug 1951	- Jul 1953	COL	Ward, Charles P.
Mar 1954	- Mar 1956	COL	Smith, Merle E.
Jun 1956	- Apr 1961	COL	Libasci, Alfonso M.
May 1961	- Aug 1961	LTC	Warren, Willard R.
Aug 1961	- Sep 1961	LTC	Eaves, Charles C.
Sep 1961	- Aug 1963	COL	Hornisher, Charles J.
Aug 1963	- May 1965	COL	Svare, Carroll S.
Jul 1965	- Jun 1967	LTC	Bradley, Robert J.
Jun 1967	- Jul 1967	LTC	MacGregor, Robert J.
Jul 1967	- Sep 1969	COL	Plum, John D.
Sep 1969	- Jun 1970	COL	Cox, William W.
Jun 1970	- Jun 1973	COL	Kaish, Kenneth R.
Jun 1973	- Aug 1975	COL	Canby, John P.
Aug 1975	- Present	COL	Dalton, James B.

Source: Fort Huachuca Museum

APPENDIX 3

Fort Huachuca Substation History Form 530



WB Form 530-1

UNITED STATES DEPARTMENT OF COMMERCE
WEATHER BUREAU
SUBSTATION HISTORY

Office preparing form Phoenix, ~~Arizona~~ AZ

Station Fort Huachuca (Current name) County Cochise State Arizona Index No. 02-3120-7 Date prepared 05-20-54 1954

Location (a)	Latitude (b)	Longitude (c)	Sec. Twp. Rng. (d)	Elevation msl (e)	Direction and distance from Post Office (f)	Direction and distance from Prev. Location (f)	Station known as (g)	Description of exposure (h)
1st	31 33'	110 22'	~~Not divided~~	5060	3 Blks NNW Fort Huachuca	Fort Huachuca	Fort Huachuca	In high valley with Mtns /open rising S. Shelter on gnd in
2nd	"	"	"	"	2 Blks NE Fort Huachuca	4 Blks SE	"	Same exposure, Shelter on gnd near Radio Bldgr.
3rd	31 35	110 20	"	4666	—	—	"	Located 100 yds SE of Avn. Operations Bldg. on reservation
4th	31 34	110 20	"	4666	2.8 Mi. WNW	2700.0 Yds. SE	"	Near Bldg. 11001 on Reservation
5th	31 34	110 20	M 21S 20E	4666	3 miles NW PO Ft. Huachuca	1.5 Mi NNW	"	In foothills NE slope Huachuca Mts. Mts 6000-7000 ft/6 Mi to SW.
6th								

(Con't) (a)	Instruments used (i)	Record: Original located (j)	Record: Where published (k)	Record: Dates 1st and last observations (l)	Observers and Dates (m)	Remarks (n)
1st 04	SRG, CRS, MxMn	Washington ~~Phoenix~~ *	MWR, CD	1-1-1886 3-31-1920	U.S. Army Post Surgeon ~~1/30-3/20~~	Station closed as records were becoming unreliable.
2nd 04	"	Phoenix AZ	none	12-1-1939 5-31-1940	Sgt. G.R. Faulkner	All equip. property US Army. Sta. not officially approved by WB.
3rd 04	"		CD	9/1/54 2/1/55	Avn. & Metlg. Dept ~~9/1/54~~	
4th 04	"		CD	2/1/55 7/31/56	"	
5th 04	~~MxMn-CRS-SRG~~ *	"	CD	8/1/56 - 9/29/1959	"	And full equipment for surface & upper air observations.
6th						

* Forms 1009 at Phoenix beginning 2-1-1900.

WB Form 530-1

Source: National Climatic Data Center

APPENDIX 4

Fort Huachuca Precipitation Record

Station: (23120) FORT_HUACHUCA,
From Year 1888 To 2006
Total Precipitation (in)

Yr	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
1888	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99
1889	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99
1890	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99
1891	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99
1892	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99
1893	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99
1894	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99
1895	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99
1896	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99
1897	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99
1898	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99
1899	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99
1900	-9.99	1.15	0.86	1.29	0.00	0.00	2.30	1.66	3.82	0.20	0.55	0.15	-9.99
1901	1.70	2.39	0.72	0.30	0.90	0.00	4.19	4.79	0.74	1.80	1.10	0.01	18.64
1902	0.17	0.00	0.02	0.00	0.00	1.03	0.89	4.43	1.21	0.10	2.45	3.37	13.67
1903	0.44	0.95	1.47	0.00	0.00	0.43	3.76	3.62	1.83	0.00	0.00	0.18	12.68
1904	0.15	0.49	0.14	0.00	1.39	0.10	5.70	6.94	0.92	1.50	0.00	0.70	18.03
1905	4.65	3.90	6.77	1.94	0.00	2.34	1.19	3.55	4.85	0.21	6.23	1.34	36.97
1906	0.30	2.42	1.10	0.24	0.00	0.00	2.97	2.74	0.54	1.07	1.00	3.75	16.13
1907	4.80	0.70	0.10	0.00	1.80	0.00	4.18	8.50	2.31	0.33	1.72	0.00	24.44
1908	0.45	2.28	0.52	0.36	0.07	0.00	3.89	4.38	1.40	0.00	0.07	2.18	15.60
1909	0.30	1.27	1.75	0.00	0.00	0.03	0.99	3.32	1.65	0.00	0.50	1.79	11.60
1910	0.60	0.00	0.00	0.00	0.00	1.35	3.40	2.95	0.02	0.20	1.02	0.00	9.54
1911	0.68	0.73	0.71	0.20	0.00	1.41	2.15	0.97	1.58	3.30	0.00	0.44	12.17
1912	0.00	1.65	2.16	1.00	0.20	0.20	6.50	6.60	0.65	0.00	0.24	0.68	19.88
1913	0.78	4.69	0.18	0.12	0.28	0.01	1.16	3.18	1.04	0.20	3.79	1.50	16.93
1914	1.35	0.31	0.90	0.00	0.30	2.76	4.06	2.87	3.37	2.24	0.90	6.51	25.57
1915	2.93	2.16	1.22	0.71	0.00	0.00	4.98	1.85	0.09	0.00	0.44	0.84	15.22
1916	2.92	0.00	1.02	0.00	1.30	0.00	1.59	3.62	2.76	0.12	0.00	0.60	13.93
1917	2.96	0.90	0.00	0.38	1.13	0.17	8.78	3.31	0.96	0.04	0.00	0.00	18.63
1918	2.08	1.38	0.00	0.10	0.00	0.66	3.15	0.90	-9.99	0.35	-9.99	-9.99	-9.99
1919	-9.99	0.55	0.40	0.50	0.45	2.47	4.24	-9.99	-9.99	0.25	1.34	1.34	-9.99

1920—1953 No Data

1954	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99	-9.99	2.79	1.79	0.00	0.10	-9.99
1955	2.74	0.60	0.35	0.02	0.00	0.00	4.91	7.67	0.05	0.65	0.13	0.22	17.34
1956	0.76	0.17	0.00	0.20	0.02	0.77	6.86	1.88	0.04	0.71	0.02	0.75	12.18
1957	1.15	0.13	0.59	0.02	0.16	1.17	2.25	4.50	0.00	1.58	0.20	0.10	11.85
1958	0.02	0.89	2.43	0.33	0.03	0.69	3.71	5.06	2.90	0.73	0.73	0.00	17.52
1959	0.00	0.81	0.00	0.53	0.00	0.81	3.20	3.41	0.03	1.63	1.22	1.22	12.86
1960	1.49	0.39	0.07	0.00	0.01	0.24	3.62	2.06	1.21	0.85	0.01	1.00	10.95
1961	0.56	0.00	0.05	0.00	0.00	1.10	3.79	6.98	1.16	2.06	0.07	-9.99	-9.99
1962	1.71	0.15	0.97	0.00	0.00	0.12	1.33	0.39	0.58	0.51	0.13	1.32	7.21
1963	0.26	0.24	0.00	0.20	0.10	0.00	3.88	3.78	0.99	0.41	2.10	0.68	12.64
1964	0.45	0.64	0.92	0.25	0.00	0.00	8.90	3.08	5.82	1.28	0.95	0.06	22.35
1965	0.60	0.50	0.34	0.14	0.20	0.23	3.60	3.26	1.51	0.00	0.32	4.13	14.83
1966	1.11	1.87	-9.99	0.00	0.01	0.39	4.59	5.07	2.93	0.00	0.40	0.44	-9.99

1967	0.02	0.32	0.41	0.34	0.12	0.33	7.32	1.74	4.13	0.15	0.26	4.78	19.92
1968	0.83	0.91	0.92	0.61	0.00	0.01	5.39	2.07	0.37	0.11	0.35	1.00	12.57
1969	0.19	0.72	0.40	0.06	0.39	0.13	4.95	3.05	0.80	0.03	0.62	0.39	11.73
1970	0.00	0.82	1.09	0.11	0.00	0.07	3.48	8.06	2.13	0.04	0.02	0.50	16.32
1971	0.17	0.70	0.00	0.07	0.00	0.27	2.63	4.40	1.96	2.01	0.22	2.45	14.88
1972	0.00	0.00	0.01	0.00	0.01	1.48	4.47	2.65	-9.99	2.72	0.97	0.50	-9.99
1973	0.68	2.10	1.55	0.00	0.07	0.23	1.98	0.42	0.87	0.00	0.00	0.00	7.90
1974	1.13	0.00	0.07	0.00	0.07	0.13	7.33	1.83	2.80	2.59	0.01	0.23	16.19
1975	0.46	0.02	0.85	0.69	0.00	0.03	4.04	0.88	3.68	0.06	0.94	0.33	11.98
1976	0.30	0.99	0.37	1.01	0.28	0.15	5.80	1.69	1.04	0.74	0.66	0.27	13.30
1977	1.42	0.03	0.40	0.11	0.10	0.29	3.80	4.06	2.35	5.48	0.20	0.78	19.02
1978	2.31	1.49	0.83	0.00	0.51	0.49	1.60	3.57	2.45	2.99	2.16	3.50	21.90
1979	2.59	0.23	1.17	0.00	0.49	0.56	1.80	2.40	0.62	0.11	0.22	0.27	10.46
1980	0.70	1.23	0.42	0.25	0.01	0.69	1.87	3.16	1.63	0.10	0.09	0.46	10.61
1981	1.62	0.53	2.21	0.77	0.64	1.13	4.22	2.09	2.62	1.05	0.36	0.00	17.24

APPENDIX 5

Fort Huachuca Temperature Record

Station: (23120) FORT_HUACHUCA,
From Year 1888 To 2006
Mean Daily Temperature (F)

Yr	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
1888	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0
1889	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0
1890	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0
1891	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0
1892	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0
1893	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0
1894	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0
1895	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0
1896	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0
1897	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0
1898	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0
1899	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0
1900	-99.0	47.6	55.5	54.0	68.2	78.3	79.4	76.7	69.5	62.2	57.1	49.8	-99.0
1901	48.3	47.2	56.4	60.3	70.9	77.3	80.1	75.0	73.3	63.5	56.7	52.1	63.4
1902	47.2	53.8	-99.0	67.3	71.4	82.8	80.6	79.3	74.8	70.4	55.8	51.5	-99.0
1903	47.0	44.5	55.3	61.5	66.1	79.5	81.2	-99.0	76.4	69.3	58.7	46.8	-99.0
1904	45.0	52.2	59.8	63.0	67.6	75.5	77.2	73.4	68.2	61.2	54.7	46.5	62.0
1905	48.2	49.1	50.5	56.7	60.7	72.5	73.6	70.2	65.5	58.2	45.7	40.7	57.6
1906	43.1	47.8	52.6	58.1	65.7	76.8	76.7	71.5	71.6	62.0	52.0	47.0	60.4
1907	45.3	49.7	55.9	61.7	59.9	69.1	72.5	68.5	67.7	60.9	44.7	47.3	58.6
1908	44.9	49.4	55.3	58.7	63.5	74.7	73.0	71.9	70.9	62.1	-99.0	45.6	-99.0
1909	45.8	45.9	52.4	62.3	74.3	82.7	81.9	76.8	72.5	66.5	57.2	44.3	63.6
1910	48.5	50.3	60.6	63.5	71.1	76.1	75.9	74.2	71.3	61.4	52.3	46.3	62.6
1911	49.5	47.4	60.2	62.8	68.9	74.9	74.8	77.7	72.3	63.0	44.2	33.9	60.8
1912	40.9	42.8	51.1	54.8	67.6	76.7	74.9	74.0	71.6	60.5	53.6	41.7	59.2
1913	41.3	44.0	50.2	59.1	66.9	73.0	76.9	75.3	72.7	71.5	50.6	42.5	60.3
1914	48.4	48.4	53.9	62.5	68.8	73.6	70.3	75.6	70.3	60.3	53.5	41.5	60.6
1915	42.8	44.7	48.5	57.5	62.8	74.6	75.5	74.8	68.5	63.9	52.4	46.8	59.4
1916	45.8	54.0	55.2	59.9	65.1	74.1	-99.0	75.1	72.5	63.4	55.5	47.4	-99.0
1917	47.2	48.7	54.2	59.9	61.7	74.9	74.7	77.7	74.5	69.9	60.7	54.6	63.2
1918	-99.0	-99.0	59.5	59.5	-99.0	78.9	80.7	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0
1919	-99.0	-99.0	-99.0	64.2	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0
1920	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0
1921	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0
1922	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0
1923	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0
1924	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0
1925	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0
1926	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0
1927	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0
1928	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0
1929	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0
1930	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0
1931	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0
1932	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0
1933	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0
1934	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0
1935	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0
1936	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0

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1937 -99.0-99.0-99.0-99.0-99.0-99.0-99.0-99.0-99.0-99.0-99.0-99.0  -99.0
1938 -99.0-99.0-99.0-99.0-99.0-99.0-99.0-99.0-99.0-99.0-99.0-99.0  -99.0
1939 -99.0-99.0-99.0-99.0-99.0-99.0-99.0-99.0-99.0-99.0-99.0 51.6  -99.0
1940  46.5 47.4 54.0 58.4 68.9-99.0-99.0-99.0-99.0-99.0-99.0-99.0  -99.0
1941 -99.0-99.0-99.0-99.0-99.0-99.0-99.0-99.0-99.0-99.0-99.0-99.0  -99.0
1942 -99.0-99.0-99.0-99.0-99.0-99.0-99.0-99.0-99.0-99.0-99.0-99.0  -99.0
1943 -99.0-99.0-99.0-99.0-99.0-99.0-99.0-99.0-99.0-99.0-99.0-99.0  -99.0
1944 -99.0-99.0-99.0-99.0-99.0-99.0-99.0-99.0-99.0-99.0-99.0-99.0  -99.0
1945 -99.0-99.0-99.0-99.0-99.0-99.0-99.0-99.0-99.0-99.0-99.0-99.0  -99.0
1946 -99.0-99.0-99.0-99.0-99.0-99.0-99.0-99.0-99.0-99.0-99.0-99.0  -99.0
1947 -99.0-99.0-99.0-99.0-99.0-99.0-99.0-99.0-99.0-99.0-99.0-99.0  -99.0
1948 -99.0-99.0-99.0-99.0-99.0-99.0-99.0-99.0-99.0-99.0-99.0-99.0  -99.0
1949 -99.0-99.0-99.0-99.0-99.0-99.0-99.0-99.0-99.0-99.0-99.0-99.0  -99.0
1950 -99.0-99.0-99.0-99.0-99.0-99.0-99.0-99.0-99.0-99.0-99.0-99.0  -99.0
1951 -99.0-99.0-99.0-99.0-99.0-99.0-99.0-99.0-99.0-99.0-99.0-99.0  -99.0
1952 -99.0-99.0-99.0-99.0-99.0-99.0-99.0-99.0-99.0-99.0-99.0-99.0  -99.0
1953 -99.0-99.0-99.0-99.0-99.0-99.0-99.0-99.0-99.0-99.0-99.0-99.0  -99.0
1954 -99.0-99.0-99.0-99.0-99.0-99.0-99.0-99.0 75.3 68.0 57.8 50.0  -99.0
1955  42.1 45.1 54.5 60.8 66.6 77.8 77.0 74.3 75.3 69.1 55.5 52.7   62.6
1956  51.9 45.2 57.3 59.9 72.1 80.3 76.9 75.5 77.0 64.9 51.2 46.0   63.2
1957  48.0 56.0 53.3 59.7 64.7 79.1 79.4 75.9 75.1 62.2 49.2 49.7   62.7
1958  45.3 50.6 48.2 59.7 72.7 79.0 77.9 75.9 71.8 63.1 53.2 51.6   62.4
1959  50.6 48.7 54.5 63.8 67.4 79.2 77.6 73.2 73.1 64.0 51.7 45.8   62.5
1960  41.8 44.4 57.5 61.6 67.9 78.7 77.5 76.9 74.6 62.3 55.4 45.2   62.0
1961  47.1 49.8 54.4 62.2 69.1 78.1 77.5 74.2 70.8 63.4 50.5-99.0  -99.0
1962  44.8 51.4 49.2 65.7 67.7 75.4 76.6 80.0 73.4 66.6 57.9 48.7   63.1
1963  44.8 52.6 54.2 60.6 71.9 75.8 78.5 73.4 73.8 67.3 53.4 47.4   62.8
1964  43.1 43.4 50.0 58.1 68.4 75.6 77.9 74.4 69.4 65.6 50.6 48.2   60.4
1965  48.8 46.9 51.2 60.6 65.8 72.6 76.9 76.3 70.0 65.6 57.8 46.4   61.6
1966  42.4 42.6-99.0 61.5 70.2 76.0 78.7 74.3 70.3 62.7 56.5 46.5  -99.0
1967  46.7 50.7 57.0 58.4 66.8 73.6 76.2 75.0 70.8 65.2 57.2 43.2   61.7
1968  46.4 53.3 52.4 56.9 67.5 77.6 75.4 72.3 71.9 66.0 52.6 45.4   61.5
1969  50.4 47.3 49.3 61.8 68.8 75.6 77.7 78.2 73.2 62.0 52.2 47.9   62.0
1970  46.2 50.8 50.8 56.5 68.9 77.2 78.7 75.4 70.1 60.5 55.7 49.7   61.7
1971  47.9 48.3 56.2 58.3 64.7 74.6 78.7 73.6 72.1 58.8 53.5 44.1   60.9
1972  48.1 52.0 60.7 62.0 67.1 75.1 78.9 75.0-99.0 59.6 47.7 43.9  -99.0
1973  42.1 48.1 47.4 55.5 68.4 77.4 77.6 77.9 74.6 65.9 55.7 49.1   61.7
1974  48.3 48.5 56.6 60.9 68.9 81.7 75.8 75.1 70.6 61.8 53.4 44.4   62.2
1975  47.8 48.2 51.2 54.2 65.7 76.1 76.8 78.9 71.0 64.3 54.0 47.8   61.3
1976  46.8 52.8 53.8 59.7 68.4 77.0 75.5 76.0 70.4 60.9 52.2 46.2   61.7
1977  46.0 52.0 50.5 61.0 66.3 78.2 77.8 77.1 73.4 64.6 56.0 53.1   63.0
1978  48.6 48.1 56.8 60.8 67.9 79.4 80.2 75.8 71.7 66.7 53.8 43.7   62.8
1979  43.5 49.9 52.8 61.3 66.0 76.2 80.2 75.7 75.3 69.2 52.1-99.0  -99.0
1980  49.3-99.0 52.4 61.1 66.4 80.3 80.7 76.7 74.3 62.8 54.5 52.5  -99.0
1981  48.8 52.8 52.5 63.8 67.3 79.7 77.1 77.0 72.9-99.0-99.0 54.6  -99.0
1982 -99.0-99.0-99.0-99.0-99.0-99.0-99.0-99.0-99.0-99.0-99.0-99.0  -99.0
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APPENDIX 6

Methodology

The primary sources of information for this study were the Fort Huachuca observers' daily weather records themselves. Copies of their monthly reports and the data digitized from those reports are available from the Arizona State Climatologist at Arizona State University, in Tempe, Arizona; Western Regional Climate Center in Reno, Nevada; 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 Fort Huachuca, its history, its people, and its climate. The author visited and collected information from the holdings of the Phoenix Public Library and the Arizona State Library and Archives in Phoenix; the Arizona Historical Society Library and the Tucson-Pima Count Public Library in Tucson; the Huachuca City Public Library, the Sierra Vista Public Library, and the library at the Fort Huachuca Museum in Cochise County Arizona; the National Archives and Records Administration in College Park, Maryland; the Smithsonian Institution Archives in Washington D.C.; the National Library of Medicine in Bethesda, Maryland; the Western Kentucky University Library in Bowling Green, Kentucky; and the National Climatic Data Center Library at Asheville, North Carolina.

The tertiary sources were reference materials that are available on-line. Among those were the metadata preserved by the National Climatic Data Center. In addition, substation histories previously prepared were consulted. 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 the Fort Huachuca. 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 at Fort Huachuca, judge the trustworthiness of the observers who collected them, and determine the climatological significance of the whatever variability may be discerned.

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