

**THE SEARCH FOR A MISSING 19TH-CENTURY
ASTRONOMICAL MONUMENT,
NEAR PUEBLO, COLORADO**

A Summary of Personal Research, 2009-2014

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By William E. Wilson¹

INTRODUCTION

In May, 2009, I was living in Georgetown, CO, and nearing the completion of a six-year personal project to learn about and tell the story of the six stone survey monuments, or markers, that the Wheeler Survey had installed in Colorado during 1873-74. At that time, I visited the office of the Pueblo County Historical Society (PCHS) in hopes of learning more details about the specific site in South Pueblo where Dr. C.L.F. Kampf, Wheeler's astronomer, had set up his instrumentation to determine latitude and longitude. During my conversation with George Williams, a long-time active member of PCHS, he gave me a guidebook² to local historical markers that contains two photographs³ of an engraved stone monument that looks very similar to the Wheeler monuments that I had been studying. Unfortunately, the two inscriptions that show on the photographs of what I later named the "Goodnight monument" are minimal and insufficient to identify the date and party that installed it. Furthermore, the location of the monument at the time the photographs were taken is a few miles west of Pueblo, and thus it did not correspond to any site description that I had encountered in the Wheeler reports. My immediate response upon returning home to Georgetown was to review the pertinent Wheeler reports to determine if I had overlooked information about this monument. Finding no reference to such a marker, I made no mention of it in my published report.⁴ Nonetheless, those photographs triggered a research effort that I pursued intermittently over the next five years, culminating in this report.

George Williams told me that little was known about the monument, and I soon learned just how true that was. The write-up in the PCHS report gave me a good start: it describes the location of the site, alongside SR 96 west of Pueblo; states that when the highway was widened, "the Commander of Fort Carson was requested to remove and store the marker;" suggests that the monument may have

been placed in 1820 by members of Stephen Long military expedition; and notes that the only visible inscriptions on monument when the photographs were taken in the 1970s were “WAR DEPT” on one face and “LONG” on the opposite face.⁵ However, the responses to my initial inquiries to various Ft. Carson personnel indicated that they were unable to find any records of the monument and that the present whereabouts and fate of the marker were unknown. As a result, the objectives of my research on the Goodnight monument became clear, namely, to answer three compound questions: (1) Who initially ordered the monument, what was its purpose, and when and where was it installed; (2) Who removed the monument and where did they take it; and (3) What happened to the monument and if it still exists, where is it today.

My efforts to answer these questions involved library research; extensive correspondence, mostly by email; telephone calls; and field visits. In August, 2011, my wife and I moved to Chapel Hill, NC, and so my further research was basically limited to correspondence. By the time I closed out my active study of the Goodnight monument in 2012, I had been able to fully answer only question no. 2. Today, the monument’s origin and current whereabouts are still unknown, though I have eliminated some possible answers to those questions and speculated on others.

This document is a summary of the lines of inquiry that I took, the information that I obtained, and the conclusions that I reached. I consider the report to be an ‘informal’ one. Although the research was rigorous, the writing style is generally more casual than professional; I wrote it without the intent to publish; it has not had any outside reviews; and some of the citations are incomplete. I am providing copies to the individuals whom I contacted during the study, as well as friends and colleagues interested in the topic, in hopes that the material would be useful to anyone who might wish to continue the search. In addition, if someone should actually discover the monument, perhaps this document would provide some understanding of its historical significance and demonstrate the need to preserve it.

My hope had been to closely examine the Goodnight monument myself. On the basis of my familiarity with the inscriptions on the Wheeler monuments, I wanted to evaluate whether I could identify and decipher additional inscriptions, possibly obscured by weathering, on the Goodnight monument. Such an inspection might give clues as to who installed the marker and when, but that will have to await future discovery and analysis by someone else, assuming the marker still exists and can be found.

SITE

Using the description of the site location in the guidebook by PCHS, I visited the site in May, 2009, long after the monument had been removed. The directions indicate that the site is two miles west of Pueblo Boulevard (SR 45), on Thatcher Avenue (SR 96). Specifically, the monument position is “approximately 150 feet southwest of the barn built by Charles Goodnight in 1870.”⁶ Later, I scaled the distance on a U.S. Geological Survey (USGS) topographic map,⁷ and I measured about 1.7 miles between Pueblo Boulevard and the monument site.

In the fall of 1979, Dick Annand, District Environmental Manager, Colorado Department of Highways (CDH, now Colorado Department of Transportation, or CDOT), was making a field check in preparation for a project to improve SR 96. He later reported his findings in a memorandum to the CDH that he signed for W.H. Harris, District Engineer: “...a stone marker was discovered near the existing right-of-way line 500 feet west of the Goodnight barn on property owned by Valcro.”⁸ He further noted that “that marker is located on the inside of the curve in front of the Arkansas Valley Nursery, 5 to 6 feet lower than the roadway. The brick house situated behind the marker is now leased by Dwight Biggs as a private residence and office space for the nursery.”⁹

K.M. Gambrill, CDH Historian, identified the site location more formally in a “Colorado Cultural Resource Survey – Inventory Record.” He plotted the location on a copy of the U.S. Geological Survey Northwest Pueblo topographic quadrangle map and identified the Township/Range/Section position as being in T21S, R65W, SW¹/₄ NW¹/₄ NE¹/₄ NW¹/₄ Sec. 5.¹⁰ He further described the site as being “about 20 feet north of State Highway 96 near mile post 51”¹¹ and “30 m. [about 100 feet] south of and 10 m. [about 33 feet] east of Hudspeth house,”¹² the brick house mentioned by Annand. The coordinates of the site are longitude 104° 41’ 35” W and latitude 39° 15’ 25” N.¹³ Altitude of the site defined by these coordinates is 4,734 feet.¹⁴

The name “Goodnight” is appropriate for the monument. In 1980 it sat near the historic Goodnight Barn and not far from Pueblo’s western suburb of Goodnight. The name itself comes from Charles Goodnight, who in the 1870s owned the property as part of his Rock Canyon Ranch in the Arkansas valley. He was a Texas cattle baron who, with his partner, Oliver Loving, famously blazed a 2,000-mile trail that eventually stretched from Texas through Denver to Cheyenne. They made several cattle drives along this trail, which came to bear their name. Loving was mortally wounded in 1867, and soon thereafter Goodnight bought his Colorado ranch property. In 1870 he brought his bride there,

where they lived for the next six years. The stone barn, which he built around 1871, was placed on the National Register of Historic Places in 1974 and is now owned by the City of Pueblo.

The preceding site descriptions refer only to the site that the monument occupied at the time that personnel from Ft. Carson removed the monument. The possibility exists that the monument had been moved to that site from its original location. As part of the process to evaluate the origin and historical significance of the monument, CDH personnel contacted various local citizens, historians, and organizations. These contacts revealed no documentation of a previous location. However, anecdotal evidence exists that relates to the duration that the monument had been in its latest known site and to the possibility that someone had moved it there from another site.

Among those that CDH personnel interviewed were Mr. and Mrs. Philip K. Hudspeth, who formerly owned and occupied the brick house on the site; at the time of the interviews, Valcro, Inc., owned the house and the Biggs family lived in it. Dick Annand, in his summary of his interview on October 4, 1979, with the Hudspeths, notes that Mr. Hudspeth remembered that the monument was still in its “original” site, neither damaged nor displaced, even after a disastrous flood of 1932.¹⁵ In this case, I interpret Hudspeth’s use of “original” to mean the site immediately prior to the flood. According to newspaper accounts, heavy rains on June 19, 1932, caused the Bessemer Ditch to breach its banks and inundate the area. The flood waters destroyed the Hudspeth home, which the Bessemer Ditch Company rebuilt for them on the original foundation.¹⁶

Evidently Kim Gambrill had access to more detailed notes from the Annand interview with the Hudspeths. Gambrill comments that Mr. Hudspeth told Annand that he recalled “that the marker was in its present location in 1912...”¹⁷ Gambrill reports on a second interview with the Hudspeths that was held on January 8, 1980. On the basis of that interview, he states that Mr. Hudspeth “...played near the marker as a boy...”¹⁸

On the basis of his investigation, Gambrill concludes that there is a “likelihood that it [the marker] was moved from its original location”¹⁹ and that the move occurred before 1912.²⁰ At that time, according to Hudspeth, the marker was being used as a decorative hitching post, with two steel rings mounted on the top.²¹ Indeed, Annand later provided me with further anecdotal evidence to support the conclusion that the marker had been moved from its original location: “I’m pretty sure it was Hudspeth that said the monument had been moved there...in a wagon sometime in the teens or twenties,” and that some people had told him and Gambrill that the marker was originally located in South Pueblo “near the railroad yards or in the vicinity of downtown.”²²

Some uncertainty always exists with anecdotal evidence. An additional element of complexity is introduced in this instance because there were two Philip K. Hudspeths, father and son, in Pueblo, as revealed in a quick search that I made of the 1930 and 1940 census data in Ancestry.com. One might expect that it was Philip, Jr., born about 1904, whom Annand interviewed in 1979 and CDH personnel interviewed in January, 1980. He would have been in his mid-70s in 1979 and could well have been the boy, eight years old, who played near the monument in 1912. But Gambrill names the couple that CDH personnel later interviewed as being “Lula and Phil K. Hudspeth.” Census data show that Lula, born in 1879, was the wife of Phil, Sr., born about 1878 (the wife of Phil, Jr., was Elizabeth). Both Lula and Phil, Sr., would have been centenarians at the times of the interviews. If it were Phil, Sr., who played near the monument as a boy, that probably would have been in the 1880s. Perhaps the man and woman that Gambrill interviewed were Phil, Jr., and his mother Lula, rather than husband and wife.

Annand later reported to me that he was pretty certain that it was Phil Junior, not his father, with whom he had talked. He also recalled that the interview took place via telephone, and that Phil Hudspeth was quite ill at the time, so that the conversation did not last long. Annand wrote me that Kim Gambrill died a few years ago, and so I was not able follow up with Gambrill to determine whether he had talked to father or son Hudspeth.²³

DESCRIPTION

Descriptions of the monument are from photographs and texts from the 1970s and 1980, and from anecdotal evidence of inscriptions, no longer visible, that may have existed in the past, based on the two interviews with the Hudspeths.

As it stood alongside SR 96 in 1979, the exposed marker measured 1.5 feet wide by 1.5 feet deep by 2.5 feet high. The stone is described as “red sandstone”²⁴ and “hard, light-colored sandstone.”²⁵ From the photographs the surfaces appear to be highly pockmarked by weathering. Phil Hudspeth thought that the sandstone came from the bluff that is 400-500 feet south of his house.²⁶

In the photographs, the inscription “LONG” is clearly visible in the upper left-hand corner of one face, except the “L” is only hinted at.²⁷ “WAR DEPT” is inscribed in the upper center on the opposite face.²⁸ Two steel pins are embedded in the monument; their cut-off rusted tops are nearly flush with the top surface.²⁹ In his interview with Dick Annand, Phil Hudspeth recalled that additional inscriptions used to be visible on the monument, but the surfaces deteriorated during the 1920s. The inscriptions that he remembered, as reported by Annand, were “GENERAL M.E.” and “U.S. ARMY

CORP [*sic.*] OF ENGR”.³⁰ In the January, 1980, interview, Hudspeth is reported to have recalled seeing latitude and longitude numbers and the words “Corps of Engineers” on the stone.³¹

From the photographs, the weathering of the two surfaces shown appears to be relatively uniform in degree of pock-marking. In particular, a close-up of the surface with the engraving “LONG” shows no significant difference between the degree of weathering where the inscription occurs and the degree of weathering of the surface immediately below the inscription.³²

In 2007 I had contacted Dr. Michael J. Brodhead, Historian, Office of History, U.S. Army Corps of Engineers, Alexandria, VA, during my research of the Wheeler monuments.³³ I turned to him again to see if he could find any record of an army general with the initials of “M.E.” He checked “Heitman’s Historical Register,” which lists all regular army officers and volunteer officers with the rank of major and above up to 1903. Brodhead found no generals listed with those initials.³⁴ In later sections, I discuss the significance of other inscriptions, observed and recalled, and of the presence of embedded steel pins

PURPOSE

The installers of the Goodnight monument probably meant it to serve as a permanent survey marker to indicate a point where a surveyor had determined values of latitude and longitude by astronomical means. On the top surface, the surveyor often would place a heavy, smooth capstone, upon which he would place the transit for making his observations. The original sandstone block probably included spaces for inscribing the values of latitude and longitude (after they had been determined by astronomical observations); the name and sponsoring organization of the survey expedition; and the year of installation. The installers probably assumed that such a marker would serve as a useful reference point for any ongoing or future mapping endeavors.

I came to these conclusions on the basis of my familiarity with similar monuments that the Wheeler Survey installed in Colorado in 1873-74. Details are provided in later sections.

ORIGIN

Various clues exist as to what surveying party installed the Goodnight monument, but nowhere in the literature did I find a specific reference to an astronomical monument at the Goodnight site. We know from the “WAR DEPT” inscription that it was a military expedition, probably one of the many that traversed the Arkansas valley route to and from the mountains and plains during the 19th century.

Some of these groups had scientific and mapping as well as military responsibilities. I conducted brief literature reviews of some of the possible candidates and more detailed reviews of others.

Zebulon Montgomery Pike (1806)

I include Lt. Pike's 1806 expedition, not because he is a likely candidate for installing the monument – and indeed, he almost certainly did *not* do so – but rather because of his fame; the fact that his was the very first American military expedition to explore up the Arkansas valley in Colorado; and his route is well defined and took him close to the Goodnight monument site. Before Pike set out from St. Louis with 20 men on July 15, he received his instructions by letter from General James Wilkinson, Commander of the Army and his immediate supervisor. The letter read in part:³⁵

Let your courses be regulated by your compass and your distances by your Watch... The instruments which I have furnished you will enable you to ascertain the variation of the magnetic needle and the latitude with exactitude, and at every remarkable point I wish you to employ your telescope in observing the eclipses of Jupiters Satellites, having previously regulated your Watch by your sextant, taking care to note with great niceity the periods of immersion of the eclipsed Satellite. These observations may enable us after your return, by application to the appropriate tables, to ascertain the longitude.

Pike was to seek the headwaters of the Arkansas River, then move south to the headwaters of the Red River and follow that river back to the Mississippi River, mapping the terrain as he went, all within the newly-acquired Louisiana Purchase. He was meticulous in documenting his bearings, distances, meteorological data, and other observations.³⁶ He also maintained a daily journal, which generally consists of abbreviated commentary on events and the distance traveled each day. He published only one book, in 1810, which includes his journals, scientific observations, and maps; his original papers are in the National Archives. I examined several later editions of his journal with commentary by various editors; none of these editions contains tabulations of his scientific observations.³⁷

General Livingstone's instructions also included the requirement that Pike should have extensive interactions with various tribes of Native Americans that he would encounter along the way. Carrying out these duties probably accounts for his slow progress across Nebraska and Kansas before heading south to the Arkansas River and west toward the mountains. Not until mid-November did he

spot what he called the “Grand Peak” (today’s Pikes Peak) from the plains of today’s Colorado. On November 23rd, he and his party set camp on the south side of the river, just west of its confluence with Fountain Creek.

There they built a crude breastwork of logs, from which Pike and three of his men set out “to climb the high point...in order to be enabled ...to lay down the various branches and positions of the country.” On the second night, November 25, they camped at the base of the mountains, alongside Turkey Creek. There Pike recorded that he “took a meridional observation and the altitude of the mountain.” They finally reached a summit on November 27, but it was not the summit of “Grand Peak.” Rather, it was a summit south of Pikes Peak, though historians still debate exactly which mountain it was. Furthermore, he was unable to make observations of the landscape far below him, for as they neared the summit, stumbling through snow “middle-deep,” the “unbounded prairie was overhung with clouds.” The men then hurried back to the breastwork camp, arriving in the midst of a snowstorm on November 29.

On the 30th, impatient to get moving, Pike broke camp, despite the fact that it was “snowing very fast.” The party traveled 15 miles along the south bank of the Arkansas River, setting camp near but short of the mouth of Turkey Creek.³⁸ This route would have taken them past the site of the Goodnight monument. Coues notes that they passed the sites of places that in his time (1895) were called Goodnight, Vegas, and Meadows.³⁹ On an 1896 map of Colorado, these names appear as communities, about 3-4 miles apart;⁴⁰ of these place names, only Goodnight appears on modern topographic maps.⁴¹

On December 1, with “the storm continuing with violence,” they remained encamped. The skies cleared that night, and on the 2nd they resumed their westward march. In about 2 miles, they needed to cross to the north side of the river, because a ridge that came down to the stream on the south side blocked their way. Although the ford was a good one, it was a bitterly cold day and the “ice ran very bad.” As a result, two men got frozen feet. Finally, on December 5, they reached the site of modern Cañon City. From there he continued his roundabout journey, which included an involuntary escort to Santa Fe and on to Chihuahua and eventually Louisiana, all courtesy of the Spanish.

Undoubtedly, Pike made no astronomical observations for latitude and longitude during his march from Pueblo to Cañon City. The snowy and cold weather, his eagerness to keep moving, and the lack of any significant features that would warrant the time necessary to make such observations all lead to this conclusion. Furthermore, there were no quarries, no stone engravers, and no infrastructure

that could produce and deliver an engraved block of sandstone. Nonetheless, he set the stage for numerous military expeditions, one of which was responsible for the Goodnight monument, to follow in his footsteps.

Stephen Harrison Long (1820)

It is understandable that some who know that the word “LONG” is engraved on the Goodnight monument would surmise that Major Stephen Long’s 1820 military expedition through the area was responsible for installing the survey marker. For example, in the PCHS book that describes monuments in Pueblo County, the title of the section on the survey marker is “Major Stephen H. Long’s Expedition of 1820.” The text does qualify this assertion by stating that placement “May have been done by members of Long’s party...”⁴²

“LONG” also appears on two Colorado survey monuments that are similar to the Goodnight monument. Members of the Wheeler Survey installed these monuments in the 1870s. For each of these, directly below “LONG” is the term “LAT,” and the two together clearly mean “Longitude” and “Latitude.” Although “LAT” is not visible in the Goodnight monument, weathering of the rock may have eradicated it along with other engravings. If the word “LONG” were meant to be the expedition leader’s last name, it would be logical to precede it with his rank and first name. However, in both the Goodnight monument⁴³ and the Wheeler monument in Georgetown,⁴⁴ “LONG” appears in the upper left corner of one side, thus leaving no room for a full name. Instead, quite likely the intent was to engrave the values of longitude and latitude once they had been determined.

The correct interpretation of “LONG” on the Goodnight monument does not in itself preclude the possibility that members of Major Long’s expedition did indeed install the marker. In fact, Long’s expedition did make astronomical observations to determine longitude and latitude along the Arkansas River valley. Long’s group was the scientific component of a broader plan conceived by John C. Calhoun, Secretary of War under President James Monroe. The general goals of this plan, which also initially included a large military component, were to provide protection of the northwestern frontier and to encourage expansion of the fur trade.⁴⁵ Long’s party was to explore the land between the Mississippi River and the Rocky Mountains, the Missouri River and its tributaries, and the Red, Arkansas, and Mississippi rivers above the mouth of the Missouri. Secretary Calhoun further directed them to make detailed observations of the topography, natural history, botany, and geology of the country.

Major Long and his crew set out from Pittsburgh on May 5, 1819, and in September they established winter quarters about 20 miles north of present-day Omaha. They were joined shortly by the military branch, known as the Missouri expedition and consisting of about 1,000 troops, who set up an encampment nearby. However, before the expedition could get underway in late spring of 1820, Congress cut appropriations for the military component and revised the route for the scientific component. Instead of proceeding up the Missouri River, as initially planned, Long's party should "go by land to the source of the river Platte, and thence to the Arkansas and Red rivers to the Mississippi."⁴⁶

When Long resumed his westward journey in June, 1820, his party consisted of the following personnel: Edwin James, botanist and geologist; Capt. John R. Bell, official journalist for the expedition; Thomas Say, zoologist; Titian Ramsey Peale, naturalist; Samuel Seymour, painter; Cadet William Swift, assistant and topographer; and 13 others in various support capacities. The route to the Arkansas River was by way of the South Platte River, then south along the foothills of the Rockies.

During July 13-15, they camped alongside "Boiling-spring creek" (Fountain Creek), where "complete sets of latitude and longitude were taken." The reported bearing of Pikes Peak at the encampment was N67°W, and the distance was about 25 miles. The coordinates, bearing, and distance do not plot as a single location for the camp, but it probably was at or several miles south of present-day Widefield, Colorado.

On July 16, they moved from their encampment "in a south-western direction to the Arkansa[s]," a ride of 28 miles. Late in the afternoon, they "arrived at the brink of the precipice which divides the high plains from the valley of the Arkansas." They searched for a place to descend and eventually found a rugged ravine and descended to "a beautiful level plain, having some scattered cotton-wood and willow trees, and affording good pasture for our horses."⁴⁷ Here they encamped during July 16-18.

The distances of the campsite from Cañon City and from Pueblo provide a basis for approximating the location of the camp site. From Bell's journal, Fuller and Hafen estimate that the camp site was about 10 miles west of today's Pueblo.⁴⁸ Bell and James made an excursion upstream from the camp site and "arrived after a toilsome journey of about 30 miles at the spot where the Arkansa[s] leaves the mountains."⁴⁹ Although the two distances do not coincide at a single point, they are close enough to indicate that the site probably was on the valley floor in the central part of today's Pueblo Reservoir.

On July 19, the party continued its way downstream, traveling 25 miles on the north side of the Arkansas. Bell noted that they crossed two creeks, one of them he called “Castle Rock Creek,”⁵⁰ still another name for today’s Fountain Creek. They observed the St. Charles River coming in from the southwest and camped for the night at a site two miles farther on.⁵¹ They covered another 26 miles on the 20th and 14 miles on the 21st. This last stop was probably at the site of modern Rocky Ford,⁵² and here they stayed several days while Long and his men prepared to divide into two groups. One group, under the leadership of Captain Bell, was to continue down the river to Fort Smith, where they were to await the arrival of the other group. At 5 a.m. on the 24th, the second group, consisting of Long, James, Peale and seven others, forded the Arkansas and headed southward in search of the sources of the Red River.⁵³

Major Long made astronomical observations at three of the four encampments along the Arkansas, in addition to the observations he made at the camp alongside Boiling Springs Creek. At some sites, he made multiple sets of readings. For example, James notes in his report that on July 22, “Astronomical observations were resumed...,”⁵⁴ and he presents “the results of several sets of observations”⁵⁵ that Long made while encamped at the last Arkansas site.

Evidently the observations were not processed to obtain values of latitude and longitude until after the expedition. On July 19, Bell recorded in his journal:⁵⁶

Yesterday and the day preceding, Major Long took a set of astronomical observations by which the latitude and longitude of our first camp on the Arkansas will be determined – the observations are not calculated, I am not therefore able to state result of any observation taken on the tour.

J.D. Graham compiled the coordinate values that were determined during the Long expedition in a table that is contained in James’ report.⁵⁷ Unfortunately, the values vary widely in their accuracy, at least when comparing results where the actual locations of the observation sites are reasonably well known. For example, the coordinates that Long determined for the camp on Boiling Springs Creek describe a point that is about 50 miles west and 31 miles south of the camp, whereas the coordinates for the last stop on the Arkansas describe a point that is relatively nearby, about 8 miles north and 4 miles west of the encampment. In my review of the Long expedition, I saw no reference to the method that Long used to determine latitude and longitude.

Although Major Long determined coordinates for various locations along the Arkansas valley on the north side of the river, he quite probably did not install any stone survey monument during that part

of his expedition, and certainly not at the 1980 site of the Goodnight monument, which is south of the river. I saw no reference to utilizing or installing such a survey marker. Except for quite different weather conditions, the situation that Long encountered was much like that of Pike, i.e., no civilized infrastructure existed that could produce an engraved marker. Bent's Fort, farther down the Arkansas, was not built until 13 years later, and Pueblo did not become a true settlement until 1842.

Long and his party were later criticized "for failing to accomplish their objectives, for bringing back insignificant results, and most of all, for characterizing the land between the Mississippi River and the Rockies as the 'Great American Desert.'"⁵⁸ Yet, Benson adds, their "accomplishments in art and science were considerable..." and "the explorers made significant contributions to the art of cartography."⁵⁹ William H. Goetzman, quoted by Benson, states that "Long's expedition did produce, after Lewis and Clark's map of 1814, the most important and comprehensive view of the West. His map of 1821 remains a landmark of American cartography."⁶⁰

John Charles Fremont (1840s and 1850s)

John Fremont did not attend the U.S. Military Academy at West Point, but rather, in 1838, at age 25, he was commissioned as a 2nd Lieutenant for the U.S. Corps of Topographical Engineers. He was well prepared to serve the army in the capacity of a scientist and surveyor. His college education had been at the Scientific Department of the College of Charlestown, SC, though he had been expelled in 1831, three months before his graduation. Over the next few years he taught mathematics to midshipmen and assisted in surveys of the projected route of the Charleston and Cincinnati Railroad and in Cherokee territory. His first assignment with the Topographical Engineers was to accompany the French scientist, Joseph N. Nicollet on a two-year reconnaissance of the Minnesota Territory, 1838-1839. During this time he learned methods of geodetic surveying and about how to organize and manage an expedition. Nicollet estimated that the expedition made about 90,000 readings for latitude, longitude, and altitude.⁶¹

During the decade of the 1840s and into the 1850s, Fremont made five expeditions to the West. Only the first three were under the sponsorship of the military, and of these, only the second and third included excursions along the Arkansas River and thus are of particular interest to this study. Nonetheless, each of the others had some pertinent aspects, and so I include comments about those expeditions as well.

1st Expedition (Summer, 1842). Following his orders, Fremont surveyed the Platte River up to the headwaters of the Sweetwater. From there he headed north into Wyoming, then northwest into the Wind River Mountains. He returned by the same route, and thus he did not travel along the Arkansas.

The German cartographer Charles Preuss accompanied Fremont on both this and the second expedition. He kept a private diary, and because he intended it to be read only by himself and his wife, he felt free to express his opinions. For example, on the return trip, Preuss noted (September 6) that they were “covering the same route along which they came. [It] would have been more interesting to take another route – hurrying home as fast as possible.” On that date Fremont had only taken observations for “some latitudes and two longitudes – that is all...If he had returned south via the Arkansas...we could make an entirely different map...[which would be] suitable if based on many and on correct astronomical observations. With the latter, it is worse than before. He cannot quite manage the sextant which is left. In addition, poor tallow candles, which the wind continually blows out (the lantern was drowned with the rest), and the sky is no longer so clear in September.”⁶²

2nd Expedition (1843-44). Fremont’s mission on his second expedition was to describe and map the Oregon Trail from South Pass, Wyoming, to the Willamette Valley, Oregon. This was a large group and the journey took 14 months to complete. Despite the large scale of the operation, Fremont and Preuss were the only ones trained in science, and they were equipped with “meager” scientific equipment that reflected the rapid reconnaissance that the expedition conducted.⁶³

The outbound route took them across Kansas into Colorado, reaching Ft. St. Vrain in time to celebrate July 4. The plan was to meet with a supplier of mules and provisions “at the mouth of the Fontaine qui bouit [Boiling Spring, Fountain Creek] on the Arkansas River” They encamped at noon, July 14, at the junction of Fountain Creek and the Arkansas, where Kit Carson joined the party to serve as a guide. The next day, Fremont dispatched Carson to Bent’s Fort to obtain mules, with the agreement to meet at St. Vrain on July 26.⁶⁴

Fremont made astronomical observations to obtain coordinates at this campsite, the only time on this expedition that he reported a value of longitude on the Arkansas.⁶⁵ His value for longitude is actually about 20 miles west of the campsite’s approximate location, but the latitude value is within a mile of the site.

Fremont continued his journey by heading back up Fountain Creek and on to St. Vrain. His grand loop through the West included a stop of several days at Great Salt Lake, where “they spend

several days collecting plants and rock specimens and making astronomical observations...,”⁶⁶ He returned to Colorado the following June, 1844. After exploring the three “parks” of Colorado, he entered the Arkansas valley from the north, probably along Fourmile Creek, thereby avoiding the Royal Gorge.⁶⁷ His campsite on June 28 was in the vicinity of Cañon City. From Fremont’s journal: “June 29 – Continued our road along the Arkansas, arriving before sunset at the Pueblo, near the mouth of the Fontaine-qui-bouit river.”⁶⁸ Preuss noted wryly in his journal, “Pueblo – Here we are at the same camp which we occupied almost a year ago.”⁶⁹

The next day they continued rapidly down the river and on July 1 they arrived at Bent’s Fort. There they disbanded,⁷⁰ but not before they got to celebrate their second July Fourth on the road. Preuss constructed the expedition map from the computations of Fremont and others. It portrayed only the country actually traversed, except that it included data secured from other reliable surveys. Jackson notes that “It was scientifically constructed, made during a period when man thought (too optimistically at times) that they had learned to determine latitude and longitude with reasonable accuracy, and with instruments not unlike those still in use a generation later.”⁷¹ Nonetheless, Goetzman calls it “...perhaps the most important map of the decade.”⁷² But it contained little information about the Arkansas River, which perhaps was a factor that led the Chief of the Bureau of Topographical Engineers to order Fremont’s next expedition.

3rd Expedition (1845-47). On February 12, 1845, Col. John J. Abert, Chief of the Bureau of Topographical Engineers, gave orders to Fremont to “...strike the Arkansas as soon as practicable, survey that river...It is important that the Arkansas should be accurately determined...Efforts [will be] directed to the geography of the localities within reasonable distance from Bent’s Fort, and of the streams which run east from the Rocky Mountains...”⁷³ The broader mission was to survey a route through the Rockies that was south of South Pass.⁷⁴ The initial directive was later modified to allow Fremont to send a party led by his assistant lieutenant to explore the “Southern Rocky Mountains and the regions south of the Arkansas...”⁷⁵

Fremont and his party set out from St. Louis (Westport) in late June on a rapid march to Bent’s Fort, arriving on August 2. There he paused for two weeks to wait for Kit Carson. During that time, he instructed his assistant, Lt. William G. Peck, and young Lt. James W. Abert, son of the Bureau Chief, “in the correct use of instruments employed in topographic exploration.”⁷⁶ Indeed, Fremont carried with him the most up-to-date topographic equipment: A portable transit for measuring horizontal and vertical angles, two sextants for measuring the altitudes of celestial bodies, and two pocket

chronometers for precisely measuring time, an important factor in determining longitude. His barometers had been damaged along the way.⁷⁷

By August 16, Fremont sent the two lieutenants, the only military personnel in a party of 33 men, down the Arkansas and then southward, to conduct a reconnaissance of the Canadian River, in order to satisfy the objectives of the mission. Fremont then proceeded upstream with the main party of about 60 well-armed men. By August 20 he was for the third time camped along the Arkansas at Pueblo. He evidently deemed this an important geographic location, for he later recalled:⁷⁸

I had me good instruments for astronomical observations, among them a portable transit instrument. This I set up, and established here one of the four principal positions on which depend the longitudes of the region embraced by the expeditions. The longitude was determined by moon culminations and the latitude by sextant observations of Polaris and stars in the south.

Continuing upstream, he arrived at the headwaters of the Arkansas in Mexican territory on September 2. From there he headed across Utah and Nevada for California on a mission of unspecified purpose. By December 10 he had reached Sutter's Fort.

Fremont spent much of 1846 and 1847 in California, helping to launch the Bear Flag Revolt and participating in various ways in the state's involvement in the Mexican War.⁷⁹ His role in California is not clear and still controversial, but his activities led to his being court-martialed. In January, 1848, he was found guilty of mutiny, disobedience, and conduct prejudicial to military discipline. He was sentenced to dismissal from service, but President Polk remitted the penalty and ordered him back to duty. However, Fremont chose instead to resign, thus ending his government-sponsored expeditions.⁸⁰

Fremont did not submit a formal report of his 3rd expedition to the Topographical Bureau. Nonetheless, Preuss did produce a map of his 1845 journey. Once again, like his 1843 map, it was a "white space" map, in that it showed only what the expedition had seen. Still, in its day, the map was considered to be "the most accurate portrayal of western America between the Rockies and the Pacific."⁸¹

4th Expedition (Winter, 1848-49) and 5th Expedition (1853-54). Private parties funded both the 4th and 5th expeditions, both of which had the principal goal of finding a feasible central route across the Rockies for a transcontinental railroad. In particular, Fremont designed the expeditions to ascertain the practicality of a route suitable in winter along or near the 38th parallel, by way of the Rio Grande. Fremont and his father-in-law, Senator Thomas Benton of Missouri, had a strong interest in

identifying such a route because it would connect St. Louis and San Francisco, both of which lie close to the 38th parallel. In Colorado, this line of latitude lies south of Pueblo and transects the Wet Mountains, Sangre de Cristo Range, San Luis Valley, and the San Juan Mountains. It passes very near the headwaters of the Rio Grande and today's towns of Crestone, Creede, Lake City, and Ouray.

In the fall of 1848, Fremont set out on his 4th expedition with a crew of 32 men and a team of 120 mules. They arrived at Bent's Fort in mid-November. A foot of snow already was on the ground, and the trappers at Bent's Fort strongly advised Fremont not to continue the journey. Furthermore, Kit Carson, believing that such an expedition at that time of year was foolhardy, refused to serve as guide, so Fremont hired "Uncle Dick" Wootton.

While at Bent's Fort, Fremont wrote a telling letter to his father-in-law, in which he described the difficulties but necessity of taking astronomical observations and calculating his position under unfavorable conditions.⁸²

...it requires an exertion of courage to take astronomical observations, and then calculate them at night, in a linen tent, tired and cold, and make up the notes of the day. These observations and calculations are necessary to our safety, indispensable to our safe advance in a wild unknown country...

This commentary suggests that the astronomical observations were needed on this expedition more to track the party's location than to contribute to a detailed mapping effort.

Despite the warnings and obvious hazards of mountain travel in the winter, the group headed up Arkansas River valley. The camp west of Pueblo was along the river's bottom on the north side, but as they continued westward they crossed the river several times.⁸³ At the settlement of Hardscrabble, about four miles east of today's Florence, they restocked and turned sharply south, up Hardscrabble Creek, thus completing their journey along the already-familiar Arkansas valley.

But the expedition ultimately was a failure; in fact, it was a disaster. The party managed to cross the Sangre de Cristo Range via Mosca Pass, but they had faced bitter cold and blinding snow. Some of the party had turned back, but Fremont pressed on, even after recognizing that the passes through the Sangres were too steep for a railroad. On December 22 Fremont, high in the San Juans in waist-deep snow and with his men suffering and the mules dying, decided to give up, and those that were able began to work their way south to Taos. By the time the last stragglers reached Taos on February 12, 1849, ten of the men had died. Fremont recuperated at the home of Kit Carson before heading on to California via an established southern route and with only a few of the men.⁸⁴

In March, 1853, Congress funded the Pacific railroad surveys, authorizing Secretary of War Jefferson Davis to organize the reconnaissance of several possible routes.⁸⁵ Senator Benton requested that Fremont lead the expedition to once again explore the potential for a central route. Instead, however, Davis appointed Capt. John W. Gunnison for the task. Undaunted, Fremont planned his fifth expedition, believing that Gunnison's summertime expedition would not properly evaluate the feasibility of a wintertime route. Fremont's plan was to get off to an early autumn start and be in the high mountains before the first heavy snows, thereby avoiding the difficulties of his previous expedition. Then he would return in early March to check snow depths. However, an illness delayed him, and he did not set out from Westport until September 19, 1853.⁸⁶

On this trip, Fremont turned off the Arkansas River valley at the mouth of the Huerfano River, a tributary that has its headwaters in the southern Sangre de Cristo Mountains. This junction is about 23 miles east of Pueblo. Thus on this expedition Fremont never traversed the Arkansas River valley west of Pueblo.

For much of the journey, Fremont followed the route taken by Gunnison earlier in the summer. Fremont's 5th expedition eventually completed the passage across the mountains and on to California, arriving at San Francisco on April 16, 1854. But they did not escape the blasts of winter. Once again, the party experienced "frightful suffering," surviving for 50 days on frozen horse flesh while many went barefoot in the snow. For three months the outside world heard nothing from the party. Nonetheless, one biography oddly states that the expedition was considered a success because Fremont "found safe and easy passes all the way to California, upon the straight line of 38° and 39°".⁸⁷ For his return, Fremont booked passage for New York on a Panama-bound steamer, which Stegmaier and Miller infer to be a "tacit admission that the mountains had triumphed."⁸⁸

George Montgomery Wheeler (1872-79)

In 1872 Congress approved a proposal by the U.S. Army Corps of Engineers (USACE) to map the entire area of the United States west of the 100th meridian. Lt. George M. Wheeler had conceived this ambitious project, in which he proposed to map the 1.4 million square miles in 10 years at a cost of \$2.5 million. The Corps assigned Wheeler to be project leader. The Wheeler Survey, as it came to be generally called, divided the area into 94 geodetic quadrangles that Wheeler's field parties planned to map in systematic fashion. Already three other surveys were underway in the West, civilian scientists – Ferdinand V. Hayden, John Wesley Powell, and Clarence King – led these. Although each included

work in Colorado, none had the scope of the Wheeler Survey. Furthermore, because the War Department did not sponsor them, none would have been responsible for installing the Goodnight monument.

The Wheeler Survey began astronomical field work in the Territory of Colorado in 1873. Wheeler had hired Dr. F. Kampf, a young German astronomer, to determine coordinates at six designated “main astronomical stations” along and east of the Colorado Front Range. These stations were at Georgetown, Hughes (today’s Brighton), Colorado Springs, Labran (today’s Florence), Trinidad, and, in 1874, Julesburg.

In addition, in 1873 Wheeler assigned three “Main Field Parties” to work in the West that field season. He had designated himself and his senior officers not only as party chiefs but also as “field astronomers.” These leaders determined latitude and longitude at “secondary astronomical stations,” where the accuracy of the coordinates intentionally was less precise than at the main astronomical stations. That summer, Lt. William L. Marshall was party chief of the Colorado Division., and his party focused on the drainage basins of the Arkansas, Gunnison, and Rio Grande Rivers, where the crew surveyed by triangulation. Marshall’s report to Wheeler for the field season of 1873 indicates that his party completed surveys of the drainage areas of the Upper Arkansas; there is no indication of any work done along the Arkansas between Pueblo and Canon City in 1873.⁸⁹

The Wheeler Survey had a major advantage over previous expeditions to map the region in that it had access to the rapidly expanding network of telegraphic lines, and the application of what had become known as the “American Method,” the telegraphic method of determining longitude. In the Arkansas River valley, for example, in 1872 the Denver and Rio Grande narrow-gage mainline (and, presumably, the telegraph lines) extended westward from Pueblo along the south side of the river.⁹⁰

For Kampf, the telegraphic method involved setting up at one of the main astronomical stations, hooking up to an existing nearby telegraph line, and transmitting a telegraphic signal the instant that a particular star crossed the local meridian. An astronomer was set up with similar equipment at an observatory in Salt Lake City, where he would receive and record the signal. Later, when that same star crossed the local meridian of the observatory, the astronomer there would send a signal back to Kampf’s site. The same process was repeated for multiple stars during the night and for multiple nights. The difference in time between sightings at the two sites represented the difference in longitude. Because the longitude had already been established at the Salt Lake City observatory, the longitude at Kampf’s location could be calculated. Multiple readings were taken to provide a statistically valid

sample. That summer, Kampf stayed at a given site anywhere from five days to a month before he was satisfied that he had a suitable sample. Delays were common, caused, for example, by bad weather, malfunctioning equipment, or downed telegraph lines. From Wheeler, Kampf understood that “Very substantial stone monuments that serve to mark the spot and for observing piers [would be] fabricated and set in advance of the occupancy of the stations.”⁹¹ Yet at none of the six Colorado sites was a monument already there upon Kampf’s arrival, and so he either had to track down the monument before starting his observations or use a temporary pier and return at a later time to install a permanent block. For example, in September, 1873, he returned to the Colorado Springs site to replace his brick pier with a sandstone monument that a Mr. S.G. Ward of Pueblo had furnished.

The Wheeler Survey continued mapping until 1879, when Congress prematurely terminated it and the Powell and Hayden surveys (by then, King had completed his project) and established the U.S. Geological Survey. Kampf continued as the only full-time astronomer on Wheeler’s staff until he died in the spring of 1878 from the after-effects of a field accident that he had suffered the preceding summer, thus tragically cutting short his career. We know the details of his field work for 1873 only because he kept a regular journal that first season, his “Recording Book,” that I found among the many field notebooks from the Wheeler Survey that are stored in the library archives of the University of Colorado at Boulder. He may have made such a record for each of his field seasons, but if so and if they survived, they are archived elsewhere.

Except as noted, all of the above information about the Wheeler Survey is from my report on that topic, and therein I cite the original sources.⁹² I based much of that report on Kampf’s “Recording Book” for 1873. For the succeeding years, we must rely on annual reports of the field astronomers to Wheeler, Wheeler’s annual reports to the Secretary of War, and various publications and data summaries⁹³ that resulted from the work.

In a report published in 1877 and included as volume 2 of his 7-volume final report,⁹⁴ Wheeler stated that “the monuments used as observing piers and to mark the stations during the years 1872, ’73, and ’74 were of granite or sandstone...The pattern employed lately is substantially of the same dimensions, but constructed of brick, with a stone cap for observing purposes. The expense of transporting and setting are thereby decreased, and a mark of quite permanent character is established.”⁹⁵ For his 1877 report, Wheeler included a letter of transmittal to Brigadier General A.A. Humphreys, Chief of Engineers, United States Army; he dated the letter March 19, 1877.⁹⁶ He and his

colleagues probably wrote the text of the report in 1875 or 1876, and therefore his term “lately” in the above quote probably means that he switched from stone to brick after the ’74 or ’75 season.

Wheeler also described the monument dimensions and inscriptions that his crews used in those early years: 1 ft 6 inches by 2 ft at the top, 6 ft in total length, with the surfaces in the upper 2 ft 3 inches polished and the remainder rough. His sketch of a monument shows what he labels “hole” in the center of the top surface. According to Wheeler, the inscriptions read as follows:⁹⁷

SOUTH FACE
U.S.
MERIDIAN
AND
LATITUDE MARK.
EXPLORATIONS
WEST OF THE
100TH MERIDIAN
WAR DEPARTMENT

NORTH FACE
LONG.
LAT.
ALT. FT. ABOVE SEA.
U.S. ENGINEERS
[year]

I could locate only three of the original six monuments that Kampf installed at the main astronomical stations in Colorado during 1873-74. These are at Georgetown, Trinidad, and Julesburg. Weathering has misshapen the one at Trinidad, and it has only one letter (“L”) visible;⁹⁸ the other two are rectangular and their inscriptions are complete and legible on both sides. The one at Georgetown is Kampf’s very first one, and it matches Wheeler’s description very closely, including a hole in the center of the top surface. The dimensions at the top are the same as described, and the only difference in the inscription is that in the Georgetown monument the line related to altitude is missing.⁹⁹ However, at Julesburg, where Kampf installed the last of his Colorado monuments, the text is different, as follows:¹⁰⁰

NORTH FACE

LONG

LAT

ALTITUDE

SOUTH FACE

WAR DEPT

CORPS OF ENGINEERS

U.S. ARMY

1874

In addition, the Julesburg monument has two metal posts, each 5 inches long and about 1 inch in diameter, protruding from the top of the monument. These posts held a capstone in place, which served as a temporary large, smooth, and stable surface on which Kampf placed his transit. Presumably the center hole that Wheeler described and that exists in the Georgetown monument was intended to hold a single metal post over which a capstone could be installed.

In September, 1874, Wheeler instructed Kampf to stop at South Pueblo on his way to Nebraska and Julesburg. I include this site in this discussion because it may have significance in relation to the Goodnight monument. At South Pueblo, Kampf was to determine latitude at a site that Lt. Ernest H. Ruffner, Corps of Engineers, had occupied the previous summer. Ruffner had determined longitude there for a different project. Ruffner initially built a brick pier for his platform, though he later used an existing stone post that was part of a nearby construction site. He determined longitude by telegraphic connection with an astronomer at a site in Denver. Wheeler reported that Kampf proceeded to “rebuild” the astronomical station, and not only did he determine latitude but he also made triangulation connections that he later used to compute longitude.¹⁰¹

Kampf did not include a write-up of the South Pueblo site with his reports of the six Colorado stations that he occupied in 1873-74, probably because at South Pueblo he determined longitude by trigonometric triangulation rather than by astronomical observations. Thus he did not consider the South Pueblo site to be a “main astronomical station.”¹⁰² Yet Wheeler listed data for the South Pueblo

site in his table of “Geographical Positions” (see my Table 1) for sites occupied during 1871-74. My search of the area, including the site indicated by the coordinates shown in Wheeler’s table, failed to reveal any evidence of a monument, brick or stone.¹⁰³

Wheeler reported that during the field season of 1872, even at secondary sites, his field astronomers had obtained longitude checks “where the proximity of telegraph lines and other circumstances seem to justify [it].”¹⁰⁴ Although this report preceded work in Colorado, the procedure that he described probably applied throughout the duration of the project. For example, in 1877 Wheeler reported that “As usual, when practicable, connections have been made with main and minor points of the land survey and monuments built in all cases of due importance.”¹⁰⁵

At the beginning of each field season, the field parties assigned to the Colorado Division met at a rendezvous location, where they organized and then set out for their various assignments. In 1874, the rendezvous location was Pueblo; in 1875, South Pueblo, at that time still an independent community adjoining Pueblo but on the other side of the river; and in 1876 and 1877 the location was Ft. Lyon, on the Arkansas near today’s Las Animas, about 70 miles east of Pueblo. Those locations meant that in each of those years one or more field parties had opportunities to travel and map the valley segments in the vicinity of Pueblo. For example, in 1874 Lt. C.W. Whipple and his party left “the rendezvous camp on August 1...the road was meandered south of the Arkansas as far as Canon City.”¹⁰⁶ That same season, Marshall’s party, while at Pueblo, “assisted in the 1874 measurement of the base and the development to the mountains of the initial triangles.”¹⁰⁷ Lt. Eric Bergland reported that in 1876 “...at this place [Pueblo] several triangulation stations were occupied and monuments erected on prominent points in the vicinity.”¹⁰⁸ From Pueblo, Bergland’s party continued up the Arkansas to Canon City. Wheeler reported that during the field season of 1878, no main astronomical stations were occupied in Colorado, and the Colorado field parties were not in Pueblo or along the Arkansas River.¹⁰⁹

In 1885 M.M. Macomb published tables of miscellaneous data that Wheeler’s personnel had collected during the course of the Wheeler Survey. My Table 1 (below) summarizes Wheeler’s and Macomb’s data for the Pueblo area. In several ways, the data are conflicting or at least confusing.

Table 1. Data for the Pueblo area reported by the Wheeler Survey.

Name/ Station	Reference *	Location ⁺	Expedi- tionary year	Coordinates		Altitude (ft)	Remarks
				Longitude	Latitude		
Pueblo	Wheeler (1878a)	--	--	--	--	4713	--
	Macomb (1885) Table III (1) Table III (2)	D&RG Ast. Mon.	1878 1876	-- --	-- --	4,713 4,732	
South Pueblo	Wheeler (1877a)	--	--	106° 36'57.53"	38° 15'43.84"	4731.8	Longitude by trigonometrical connection Latitude by Dr. F. Kampf
	Wheeler (1878a) Atlas (1) Atlas (2)	-- --	-- --	-- --	-- --	4745 4769	
	Macomb (1885) Table I Table III (1) Table III (2)	-- D&RG Ast. Mon	1874 1876 1874	-- -- --	106° 36'57.53" -- --	38° 15'43.84" -- --	-- 4,669 4,732
Good- night	Wheeler (1878)	--	--	--	--	4731	
	Macomb (1885) Table III	D&RG	1878	--	--	4,731	

* Wheeler (1877a), Table, "Geographical Positions," p. 488-489.

Wheeler (1878a), Map, "Central Colorado, Atlas Sheet No. 62(A)."

Macomb (1885), Astronomic and Geodetic Positions, Table I, "Primary Astronomical Stations," p. 10-11.

Macomb (1885), Barometric Altitudes, Table III, "Cities, Towns, Settlements, etc.," Colorado, p. 153-157.

⁺ "D&RG" = Denver & Rio Grande Railroad

"Ast. Mon." = Astronomical Monument

For Pueblo, Wheeler's atlas and Macomb's Table III both show a site with an altitude of 4,713 feet; the two references are probably referring to the same site, a D&RG site. That seems appropriate and straightforward. But Macomb also mentions an "Astronomical Monument" in Pueblo with an altitude of 4,732 feet. I never saw mention of such a monument in Pueblo in any Wheeler report. Furthermore, Macomb's value at that site is the same as the altitude determined at Wheeler's South Pueblo site (4731.8 feet; see my Table 1), although Wheeler reports never mention such a monument being installed in South Pueblo.

Macomb's table of coordinates and altitudes at "primary astronomical stations" (Table I), includes the six Colorado sites where Kampf installed monuments in 1873-74. Surprisingly, though, Macomb adds Kampf's South Pueblo site in his Table I.¹¹⁰ In his Table II, Macomb provides the same type of information for "secondary astronomical stations."¹¹¹ However, no Colorado sites are included in that table, despite the references to "monuments" that Wheeler's field parties allegedly installed at secondary stations.

The reported altitude of 4732 feet for Kampf's South Pueblo site does not appear at either Pueblo or South Pueblo in Wheeler's Atlas Sheet 62(A), nor does it appear in Macomb's Table III in association with South Pueblo. Rather, Atlas Sheet 62(A) shows altitude values of 4669 feet and 4745 feet in two parts of South Pueblo.

Atlas Sheet 62(A) and Macomb's Table III are the only two places where I saw the locality "Goodnight" mentioned in Wheeler documents. On the map, the word appears as a curved line of print along the center of the Arkansas valley floor, south of the tracks and river, probably indicating the name of an area or community rather than of a specific site. The map shows the altitude value (4731) near the tracks, on their southern side, and east of the end of the word "Goodnight." This value is the same as the altitude for "Goodnight (D&RG)" in Macomb's table. The mapped location is not the same site where the Goodnight monument stood in 1980. Rather, the value 4731 probably represents the altitude of the nearby D&RG tracks.

REMOVAL

Once the Colorado Department of Highways recognized in 1980 that the Goodnight monument probably would be in the right-of-way of reconstructed SH 96, the question arose of whether or not to move it. In his initial assessment, Annand stated that the highway project would not affect the marker, and he recommended that it remain in place:¹¹²

Although the vicinity of the stone marker will be altered by the placement of fill material and shifting of the roadway centerline, no materials will encroach upon the marker. Throughout construction the marker will be protected from damage [or] disturbance and will continue to remain fully exposed. It is not necessary to remove the marker or otherwise disturb its present location. Right-of-way will be acquired through this area, and the marker will be purchased. Therefore, State forces will be able to protect and maintain the marker.

Annand further requested assessment of this information and clearance from the State Historic Preservation Officer.¹¹³

Evidently the conclusion at higher levels at CDH and perhaps at the Colorado Historical Society was that the monument should be removed and stored at some appropriate location where it could be preserved. There ensued considerable correspondence during the first few months of 1980 regarding the selection of a site to store the monument, as revealed in CDOT project files. Jan Wahlers, a

historian at CDOT-HQ, transmitted (date unstated, but probably March, 2010) pertinent sections of those files to Robert Autobee, CDOT Region 4 Historian, who in turn sent them to me.¹¹⁴ Those files indicate that the PCHS wished to have the monument stored locally. The curator of the Ft. Carson Museum expressed interest in preserving the marker and offered to remove it to Colorado Springs if local agencies decided against keeping it. In addition, the State Historical Society offered to store it at the El Pueblo Museum. By April, 1980, tentative agreement was made within CDOT to donate the monument to PCHS, once the State had purchased it as part of the right-of-way purchase. As a result, Gambrill, in his April 17, 1980, Inventory Record, stated that the monument “will be given to Pueblo County Historical Society for preservation.”¹¹⁵ Evidently, however, PCHS had no suitable storage space in their facilities, a fact confirmed to me by George Williams, who informed me that “PCHS was in no position to even consider accepting it,”¹¹⁶ although at the time a member did offer to provide temporary storage until permanent facilities could be arranged.¹¹⁷

Despite this flurry of correspondence, none from that period could be located that documents the actual decision to allow Ft. Carson to remove the monument and store it at its museum. In fact, CDOT has “no record [from that time] of monument transfer between the Highway Department, the U.S. Army, or anyone at Ft. Carson.”¹¹⁸ Much later, in 2000, CDOT responded to an inquiry from a local historical society for information about “a War Department Survey marker that was moved off of SH 96 in 1983-84.” CDOT responded that “it was moved to Ft. Carson by Ft. Carson personnel. It is now in their Museum of the West.”¹¹⁹ This file provides the only date that I was able to find that indicates even approximately when the marker was actually removed, but the responder obviously was unaware that the museum had closed in 1986.

After nearly a year of inquiries during which I sought to learn more about the fate of the monument, finally in early 2011, a breakthrough occurred. At Bob Autobee’s suggestion, I contacted Stephanie Boktor, CHS Site Records Manager, and Olivia Martinez, CDOT Central Files. I explained to them my failed efforts to learn of any record of who actually received the monument and where it now resides, and that perhaps my examination of additional project files would be helpful.¹²⁰ Ms. Boktor responded that there had been no additions to the form that had been completed by K.M. Gambrill in 1980, and that she had “no information on the current location of the monument.”¹²¹ However, Ms. Martinez evidently passed the word around CDOT circles, and I soon received an email from Jeffry Eickelman, Region 2 ROW/SURVEY, stating that he had contacted Dick Annand and that Dick would be pleased to discuss the monument with me.¹²² An ensuing telephone conversation with

him and follow-up emails provided me with the first solid evidence of the monument removal. Better yet, I had obtained an eyewitness account of the event.¹²³

Indeed, both Annand and Gambrell (now deceased) witnessed the removal of the monument by Ft. Carson personnel. According to Annand, a crew of active-duty soldiers, supervised by someone associated with the museum, came in a truck with a crane. When the crew pulled the monument from the ground, Annand observed that the stone was set a few inches to a foot into a concrete base with a smooth surface. The base was about three feet in diameter at the top and about three feet in length, tapering downward. The surface of the base was smooth, with no inscriptions and no exposed aggregate. Below ground, the concrete was very rough and the aggregate was small river gravel and coarse river sand, not crushed rock. The appearance of the concrete base suggested to Annand that it was poured into a hole like concrete for a fence post and to him it had the appearance of the original base.¹²⁴

With the crane, the army crew lifted the sandstone monument and its base of concrete using heavy slings, and they placed it on a pallet on the truck bed. The sandstone and part of the base had been wrapped in a thick layer of bubble wrap, then with heavy clear plastic sheeting, all held together with duct tape. They tied the package to the pallet and then drove to Ft. Carson. State historians had cautioned Annand and Gambrell that “a zinc or copper box could be located below it [the marker] and could contain survey data... We found no box or indication that a box had been present below the stone.”¹²⁵

Annand visited Ft. Carson a year or two later (probably 1984 or 1985) to document that the monument was being properly protected. What he saw was the monument still wrapped in plastic and still on the pallet in a small warehouse-type building.¹²⁶

THE SEARCH

My entire “search” for the monument consisted of correspondence, mainly emails, with various components of the military establishment as well as with CDOT, PCHS, and CHS. In the spring of 2011 I had concluded that the monument probably had never been displayed in the museum at Ft. Carson. I came to this conclusion upon learning that Ft. Carson personnel had indeed been the ones to remove the monument and had hauled it to their base in 1982 or 1983; that a year or so later it remained wrapped and on its pallet in a warehouse; and that the museum had closed in 1986. Until midsummer, 2011, I operated on the hypothesis that even though not on display, museum personnel

would have considered the monument to be a part of the museum collection, and that therefore after the museum closed the monument would have been sent to wherever the rest of the museum collection had gone. On the basis of suggestions from various sources, the principal candidate sites that might have received the collection seemed to be 1) a museum at Ft. Hood, Texas; 2) the Engineer Museum at Fort Leonard Wood, Missouri; and 3) the Pueblo Army Chemical Depot.

So I set about contacting various parties who might help answer the question of where the collection might have been sent. Scott Hamric, Director, 3rd Cavalry Museum at Ft. Hood, reported to me that neither of the two museums there at the time, the 1st Cavalry Museum and 3rd Cavalry Museum, had the marker. He stated that when the museum at Ft. Carson closed, its collection was supposed to have been returned to the U.S. Army Center of Military History facility at Anniston Army Depot, AL. Hamric said that he would put my inquiry out over the Army Museum System Network “to see if anyone out there may have heard of the marker.”¹²⁷ He also stated that Steve Ruhnke had recently transferred from a museum in Germany to become Director of the newly opened 4th Infantry Division Museum at Ft. Carson. At Hamric’s suggestion, Ceilia Stratton, Director (Ret.), 4ID Museum at Ft. Hood, wrote me that no stone marker was included with the 4ID museum collection when the museum was relocated there in 1995-96, nor was it in any Ft. Hood collection during her tenure there (1989-2009).¹²⁸

Troy Morgan, Director, U.S. Army Engineer Museum, Ft. Leonard Wood, wrote that he had no stone marker in his collection, although he wished that it were there, because “it would be a wonderful artifact to help tell the story of western expansion, and the role of [the Corps of] Engineers in surveys and road building.”¹²⁹

George Williams, PCHS, checked with his contacts at the Pueblo Depot and reported to me that he “didn’t find any evidence of or knowledge of the...marker at the Pueblo Army Chemical Depot.”¹³⁰

On the basis of a suggestion by Michael Brodhead, USACE Historian, I contacted Col. Dennis Mrocykowski, Chief of Collections Branch, Center of Military History, Ft. McNair, DC. Brodhead had claimed that this unit was the “ultimate authority for disposition of army objects.”¹³¹ In response to my inquiry, Col. Mrocykowski said that he would ask his staff to “make a search of the Army’s historical collections to see if it [the marker] is already identified in a collection somewhere.”¹³² Shortly thereafter I received an email from Roderick Gainer, Curator, U.S. Army Center of Military History, Museum Support Center, Ft. Belvoir, VA. He provided critical information: “After consulting with the staffs of the 3rd Armored Cavalry Regiment Museum, the Fort Hood History Office, and the Army

Clearinghouse in Anniston [Alabama], I am certain that the monument was never ‘officially’ on the property book of the Army Museum system.”¹³³ He also informed me that he had briefed Steven Ruhnke, “the Curator at Fort Carson,” on the subject of the monument. In a follow-up email, Gainer further emphasized that the monument “was never accessioned into the Army Museum System property book,” and he added, “As far as anyone can tell, it never went to Anniston or Pueblo [Depot].”¹³⁴

From these reports I concluded that not only had the monument never been displayed in the museum but that it never went to whatever destination the museum collection was sent. Therefore, if it hasn’t been destroyed or trashed, it must still be lying somewhere in Ft. Carson, perhaps still clothed in bubble wrap. What was needed was a concerted physical search for it.

During the summer of 2011, my wife and I prepared to downsize and move from Georgetown to Chapel Hill, NC. Thus I was unable to fulfill my desire to visit the base and take a guided tour to search for the monument myself. During 2011, I had continued my inquiries to Ft. Carson personnel. In February I wrote to Carlos Rivero-deAguilar, Environmental Division Chief, Directorate of Public Works, Ft. Carson. He responded that he had contacted the Garrison’s Cultural Resources Program and the 4th Infantry Division/Fort Carson Museum and Historic Programs. Their “search had not revealed any new information as to the stone’s location...Should any information become available in the future concerning the marker my staff has been informed to contact you.” Rivero-deAguilar designated Wayne Thomas, Chief, NEPA and Cultural Management Branch, to be my principal contact at Ft. Carson.¹³⁵

I contacted Wayne Thomas, and in the following months he and I occasionally exchanged emails; however, I never had an indication that he actually had made a concerted effort to physically search for the marker. Finally, on July 31, when no further word was forthcoming, I sent follow-up emails to Rivero-deAguilar and Rodney Gainer, to inform them that I was preparing to move to NC and to see if there were any news to report.¹³⁶ Gainer replied that he had forwarded my email to Steve Ruhnke and that he (Ruhnke) had not able to locate the monument, but that he would be my best bet to try and find it.

My email to Steve Ruhnke of August, 2011, was the first of many that we exchanged in the following months. In it I provided some background information, and I stated that “Ft. Carson has apparently failed to keep its mandate to preserve, protect, and display this historic structure, and I

believe it is incumbent upon personnel there to make every effort to locate it. Thus I greatly appreciate your efforts to do so.”¹³⁷

Ruhnke’s curator responsibilities at the Mountain Post Historical Center kept delaying him from making a concerted effort to research the monument. In January, 2012, he reported that he had heard from the Pueblo Depot and that “they had found no traces or records of the monument,”¹³⁸ further confirming the results of previous inquiries to the Depot. In April, 2012, he provided me with an account of his investigation, which included the following activities:¹³⁹

- Conducted research to be familiar with the monument and possible locations where it was or may be.
- Researched historical information within the museum collection for any mention of the monument.
- Spoke with several long time employees within the supply and property offices at Fort Carson to see if anyone knew of anything.
- Spoke with a local Colorado Springs Historian who served as Chief of Staff at Carson in the 1970’s and has maintained ties to the installation. He could not shed any light on it.
- Engaged Pueblo Army Depot which had received historical property when the Fort Carson museum closed in 1986 and they know nothing of the monument.
- Reviewed collections at the U.S. Army Historical Clearing House at Anniston, AL, to check if it may have been shipped there from Pueblo Depot when that facility closed.
- Searched Carson for the possibility the monument may have been placed for viewing.

Ruhnke summed up his results with the following all-too-familiar statement: “Unfortunately, I have not been able to locate the monument...”¹⁴⁰ And with that, I concluded my active research to find the missing Goodnight monument.

COMMENTARY AND CONCLUSIONS

In 1980 K.M. Gambrill, Colorado Department of Highways Historian, assessed the purpose and origin of the marker (herein termed the Goodnight monument) as part of a Colorado Cultural Resource Survey. He recorded his findings in three documents that constitute the CDT Resource Survey: Inventory Record, Architectural/Historical Component Form, and Historic Property Inventory Form.

He prepared these in March and April, 1980, prior to the decision to remove the monument while State Highway 96 was being improved.¹⁴¹

From his research, Gambrill concluded that it had not been possible to positively identify the origin of the marker, but that it “seems almost certain that the stone was a topographical survey marker erected to record an accurately determined position,” and that it “seems highly likely that the marker was created by members of First Lieutenant George M. Wheeler’s topographical survey expeditions in 1873, ’74, or ’75.”¹⁴² Gambrill based these conclusions primarily on his research (which he termed “incomplete”) of reports of the Wheeler Survey and the statements of Phil Hudspeth.

In general, I concur with these conclusions. More specifically, as elaborated below, I believe the following conclusions have a high probability of being correct:

1. The monument was cut and inscribed at the request of a member of the Wheeler Survey sometime during 1873-75.
2. The purpose of the monument was to identify the site of a “main astronomical station,” where values of latitude and longitude had been obtained by astronomical means, using the telegraphic method.
3. If the monument had been used as intended, a capstone would have been placed over the two rods protruding from the top of the monument, and this rock slab would have provided a smooth and stable surface on which an astronomer would have set his transit.
4. With the concurrence of personnel from CDOT and CHS, a crew of soldiers from Ft. Carson removed the monument from its site alongside Route 96, near the Goodnight barn, in about 1983-84. The expectation of all parties was that the curator of the Ft. Carson museum would display or otherwise safeguard the monument at the army base while construction was occurring on Route 96.
5. About one year after its removal from the Goodnight site, the monument was in a small warehouse-type building in Ft. Carson, still wrapped in its plastic and lying on its pallet.
6. The monument was never displayed in the museum, which closed in 1986; was never delivered to any of the venues that received the contents of the museum after it closed; and was never on the inventory or property book of the U.S. Army museum system.
7. No records of the monument exist at Ft. Carson, and in 2012 inquiries to old-timers on the base indicated that no one stationed there at that time had any personal knowledge of it.

Further evidence, unavailable to Gambrill, that the Wheeler Survey was probably responsible for ordering the Goodnight monument is the striking similarity in dimensions, material, and inscriptions of that monument to those that Wheeler's astronomer, Dr. F. Kampf, installed in Colorado in 1873-74. Furthermore, before someone cut them flush with the surface, two metal posts protruded from the top of the Goodnight monument, just as they do in Kampf's Julesburg monument.

Long and Fremont both made astronomical observations, and Fremont explicitly states that on his 3rd expedition he made these observations in the vicinity of Pueblo. However, I could find no references to monuments in their reports. Neither explorer had access to an infrastructure that could provide a quarried cut stone with inscriptions carved in it. Furthermore, even if they could obtain such a monument, their primary purpose of obtaining coordinates was to identify their positions along their exploratory routes. Such a goal would probably not warrant the time, effort, and cost of obtaining and installing a monument.

Nonetheless, many questions regarding the early history of the Goodnight monument remain unanswered, e.g., Was the 1980 site of the monument its original site? If a Wheeler crew first installed the monument elsewhere, where was that site? Were there additional inscriptions on the stone block that weathering has since erased, or were they never there in the first place? Was the monument ever actually used for making astronomical observations? The following comments address these questions, but they are speculations based on some assumptions and meager evidence.

Wheeler probably initially intended the stone block that became the Goodnight monument to be one of his "main astronomical stations," as suggested by the inclusion of the metal posts to hold a capstone, and by the similarity of the dimensions and two inscriptions to those of his other monuments. Whether the block was actually installed as an astronomical monument depends in part on whether or not inscriptions in addition to those visible in 1980 were ever included. Phil Hudspeth's testimony that he recalled seeing additional inscriptions, even including values of latitude and longitude, suggests that the block did indeed contain the full text similar to those that occur on the Wheeler monuments at Georgetown and Julesburg.

The presence of the full set of inscriptions would imply that the monument had in fact been installed at some site for astronomical purposes. For several reasons, it seems unlikely that the Goodnight site was the original one: 1) In the reports of Wheeler and Kampf, I could find no reference to such a monument at the Goodnight site; 2) Phil Hudspeth recalled that a wagon had brought the monument to the Goodnight property sometime in the teens or twenties; and 3) it seems unlikely that

Wheeler would establish a site so close to one in South Pueblo, where he had reliable coordinates determined by Kampf, though his value of longitude was determined from trigonometric methods, not from astronomical observations. On the other hand, Dick Annand reported to me that to him the concrete base of the monument appeared to be “original.” Furthermore, the Goodnight site would have been a suitable one for making telegraphic astronomical observations because of its clear view to the north along the meridian and because of its proximity to telegraph lines.

But if not originally at Goodnight, where would have the original site have been? Perhaps Kampf installed it at one of his sites where in my field searches I could find no monument, such as at nearby Colorado Springs or Labran. For whatever reason (urbanization? flooding?), at some time the stone block at each of these sites was removed or destroyed. Mr. S.G. Ward from Pueblo, who provided the marker that Kampf installed at Colorado Springs, may have re-acquired it. Later the property owner along the Arkansas River west of Pueblo could have brought it by wagon from Pueblo to his home, where he installed it as a decorative hitching post.

Another possibility is that the monument was a late addition to Kampf’s site in South Pueblo, as suggested by the facts that Macomb 1) included South Pueblo as a “Primary Astronomical Station;” and 2) provided an altitude value there for an “Astronomical Monument.” Further support for this possibility is Annand’s anecdotal evidence that the Goodnight monument may have been originally located in South Pueblo near the railroad yards or in the vicinity of downtown. Wheeler may have decided that the site warranted a permanent stone monument because his crews frequently reconnoitered there or passed through there. Such a decision would have come in late 1874 or in 1875, after Kampf made his observations in South Pueblo but before Wheeler switched from stone monuments to brick piers with stone caps.

On the other hand, my impression that the degree of weathering is approximately the same at and below the word “LONG” suggests that “LAT” was never inscribed. If that were the case, then probably no other inscription, other than “WAR DEPT,” was ever present, which therefore implies that the block was incomplete and was never used as an astronomical monument. Such a scenario could be explained by Wheeler’s decision to switch from installing permanent stone monuments to constructing temporary brick piers, the timing of which could have interrupted the preparation of this block for use as a monument.

The fate and present whereabouts of the Goodnight monument remain a mystery. Despite my urgings, I got the impression that the emphasis of those responding to my inquiries was always on

finding some *documentation* concerning the monument, and that no one ever made a detailed, thorough, *physical search* of Ft. Carson for it. Even in Steven Ruhnke's report that he "searched Carson" he notes that he was seeking to learn if the monument had been put on display somewhere on the base. Thus I suggest that the first order of business of anyone interested in taking up the cause would be to arrange a visit to Ft. Carson and participate in a guided tour of the northern part of the base. Sadly, the real possibility exists that someone, perhaps unaware of the monument's historical significance, simply trashed it, either mistakenly or purposely. According to a friend who worked at Ft. Carson for 34 years, there has been a major expansion and construction boom there in recent years. He remembers that there was a museum in the northern part of the post, at the site of the old Mule Barns, but that the whole area has since been rebuilt.¹⁴³ Thus the monument could have been disposed of in some landfill or included in the rubble of a demolished warehouse.

SUGGESTED FURTHER RESEARCH

Whether or not the monument is ever found, in the interest of filling in details of the story, further research could help confirm the conclusions and to resolve the uncertainties. The following list offers some possible lines of investigation.

1. If the monument has not been found, conduct a thorough search at Ft. Carson. Emphasis could be on visiting warehouses and nooks and crannies of likely hiding places, such as empty lots or behind buildings. Perhaps it would be possible to examine a layout of the base from about 1980, which would show the location of the "old Mule Barns" and nearby warehouses.
2. Learn the identity of the curator of the Ft. Carson museum during the years between time the monument was hauled to the post and 1986, when the museum closed. Determine if he is available, and if so, question him about the fate of the monument.
3. Do more detailed examinations of the published reports and original papers of the Wheeler Survey and Fremont expeditions. Sort through original field notebooks, including, if it exists, Kampf's "Recording Book" for 1874. Look for any reference to a monument at the Goodnight site or at South Pueblo. Unfortunately, Wheeler's original documents became fragmented and are incomplete, and their dispersal took various highly convoluted paths. Thus identifying the appropriate present-day depositories for research purposes is a daunting task.¹⁴⁴
4. Research the genealogy of the Hudspeth family, to determine, for example, the death date of Phil, Sr., thereby helping to ascertain whether it was Phil Sr. or Jr. that was interviewed in 1980.

5. Review property records to determine ownership history of the Goodnight site and the brick house that stood nearby, including the years that the Hudspeth family was involved.
6. Check Pueblo newspaper accounts for any references to moving the monument from its original site to the Goodnight site.
7. Learn more about S.G. Ward of Pueblo, who provided the monument for Kampf at Colorado Springs. Was he a quarryman? Did he work for a specific quarry, such as the one on the Goodnight ranch?
8. If the monument is ever found, closely examine its surfaces for evidence of additional inscriptions. Have a geologist familiar with local sandstone quarries examine the lithology of the monument to see if he can ascertain a likely source of the rock.

For me, the search has been an exciting journey, regardless of the outcome. As I stated at the beginning, my hope is that this document will challenge someone to continue the journey; or that this document will inform someone who happens to come across a strange-looking stone block, perhaps wrapped in plastic.

In any case, please let me know of the outcome of any such journey or the occurrence of any such discovery!

NOTES

¹ William E. Wilson, 205 Kirkwood Drive, Chapel Hill, NC 27514, (919) 869-7147, williamwilson514@gmail.com

² Pueblo County Historical Society (1994).

³ Pueblo County Historical Society (1994), p. 186. The photographs were taken by Joanne and Edwin Dobbs in the 1970s.

⁴ Wilson (2010).

⁵ Pueblo County Historical Society (1994), p. 186.

⁶ Pueblo County Historical Society (1994), p. 186.

⁷ U.S. Geological Survey (2013).

⁸ Annand (1979), p. 1-2.

⁹ Annand (1979), p. 2.

¹⁰ Gambrill (1980), p. 1.

¹¹ Gambrill (1980), p. 16.

¹² Gambrill (1980), p. 1.

¹³ Gambrill (1980), p. 17.

¹⁴ As determined from map of Colorado consisting of seamless 1:24,000 USGS topographic quadrangles, powered by TOPO! on a National Geographic CD-ROM.

¹⁵ Annand (1979), p. 3.

¹⁶ Annand (1979), p. 3.

¹⁷ Gambrill (1980), p. 18.

¹⁸ Gambrill (1980), p. 17.

¹⁹ Gambrill (1980), p. 4.

²⁰ Gambrill (1980), p. 3.

²¹ Gambrill (1980), p.18.

²² R. Annand, written commun., email of March 30, 2011.

²³ R. Annand, written commun., email of June 26, 2013.

²⁴ As described by Gambrill (1980), p. 3.

²⁵ R. Annand, written commun., email of June 26, 2013.

²⁶ R. Annand, written commun., email of June 26, 2013.

- ²⁷ Annand (1979), p. 2; PCHS (1994), p. 186, photo on the right; Gambrill (1980), last page (unnumbered), close-up, bottom photo.
- ²⁸ Annand (1979), p. 2; PCHS (1994), p. 186, photo on the left. In Gambrill (1980), last page (unnumbered), top photo, the glare on the monument face obscures any feature.
- ²⁹ Annand (1979), p. 2; R. Autobee, written commun., email of March 22, 2010; Gambrill (1980), p. 3.
- ³⁰ Annand (1979), p. 3.
- ³¹ Gambrill (1980), p. 17.
- ³² Gambrill (1980), p. 20, lower photograph; Pueblo County Historical Society, p. 186.
- ³³ Wilson (2010), end note 46, p. 7, 30.
- ³⁴ M.J. Brodhead, written commun., email of April 27, 2011.
- ³⁵ Hart and Hulbert (2006), p. 58-59.
- ³⁶ Gardner (2006), p. __, in Hart and Hulbert (2006).
- ³⁷ See, for example, Coues (1987; originally published in 1895), Jackson (1996), and Hart and Hulbert (2006; includes Pike's journals as earlier published by Hart and Hulbert, eds., in 1932 and 1933, with a 2006 Introduction by M.R. Gardner).
- ³⁸ Coues (1987), p. 459, footnote 50.
- ³⁹ Coues (1987), p. 459, footnote 50.
- ⁴⁰ History Colorado (2012), p. 24-25.
- ⁴¹ U.S. Geological Survey (2013).
- ⁴² Pueblo County Historical Society (1994), p. 186.
- ⁴³ Pueblo County Historical Society (1994), photo, p. 186; Gambrill (1980), photo, p. 20.
- ⁴⁴ Wilson (2010), p. 9.
- ⁴⁵ Benson (1988), p. ii-iii.
- ⁴⁶ Benson (1988), p. iii.
- ⁴⁷ Benson (1988), p. 230-231.
- ⁴⁸ Fuller and Hafen (1957), p. 169, footnote 76.
- ⁴⁹ Benson (1988), p. 234.
- ⁵⁰ Bell (1820) in Fuller and Hafen (1957), p. 177
- ⁵¹ Graham (1822) in James (1823), p. xxxvii-xxxix.
- ⁵² Fuller and Hafen (1957), footnote, p. 181.
- ⁵³ Benson (1988), p. 246-247, 249.
- ⁵⁴ James (1823), p. 65.
- ⁵⁵ James (1823), footnote, p. 66.
- ⁵⁶ Bell (1820) in Fuller and Hafen (1954), p. 177.
- ⁵⁷ Graham (1822) in James (1823).
- ⁵⁸ Benson (1988), p. i.
- ⁵⁹ Benson (1988), p. xvii.
- ⁶⁰ Benson (1988), p. xvii.
- ⁶¹ Goetzman (1991), p. 73.
- ⁶² Gudde and Gudde (1958), p. 65.
- ⁶³ Goetzman (1991), p. 87.
- ⁶⁴ Jackson and Spence (1970), p. 436.
- ⁶⁵ Jackson and Spence (1970), p. 778, 773.
- ⁶⁶ Goetzman (1991), p. 91.
- ⁶⁷ Jackson and Spence (1970), footnote 189, p. 715.
- ⁶⁸ Jackson and Spence (1970), p. 720.
- ⁶⁹ Gudde and Gudde (1958), p. 138.
- ⁷⁰ Goetzman (1991), p. 101.
- ⁷¹ Jackson and Spence (1970), p. 12.
- ⁷² Goetzman (1991), p. 104.
- ⁷³ Goetzman (1991), p. 117.
- ⁷⁴ Morgan (2011), p. 327.
- ⁷⁵ Goetzman (1991), p. 117.
- ⁷⁶ Goetzman (1991), p. 123.
- ⁷⁷ Traas (1993), p. 30.
- ⁷⁸ Nevins (1956), p. 440-441, quoting from Fremont's "Narratives."
- ⁷⁹ Goetzman (1991), p. 122; Morgan (2011), p. 327.
- ⁸⁰ Traas (1993), p. 31.
- ⁸¹ Traas (1993), p. 44.
- ⁸² Spence (1984), p. 73.
- ⁸³ Richmond (1989), p. 5.
- ⁸⁴ Web site: www.wikipedia.com (John C. Fremont).

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- ⁸⁵ Stegmaier and Miller (1988), p. 77.
- ⁸⁶ Stegmaier and Miller (1988), p. 77-80.
- ⁸⁷ Web site: [www.biography.edigg.com/General John C. Fremont.shtml](http://www.biography.edigg.com/General_John_C._Fremont.shtml).
- ⁸⁸ Stegmaier and Miller (1988), p. 96.
- ⁸⁹ Wheeler (1874a), p. 484, *in* Secretary of War (1874).
- ⁹⁰ Flanagan (1966), p. 15-16.
- ⁹¹ Wheeler (1873), p. 1,213, *in* Secretary of War (1873).
- ⁹² Wilson (2010).
- ⁹³ See, for example, Macomb (1885).
- ⁹⁴ Wheeler (1875-89).
- ⁹⁵ Wheeler (1877a), p. 487.
- ⁹⁶ Wheeler (1877a), p. XIII.
- ⁹⁷ Wheeler (1877a), p. 487.
- ⁹⁸ Wilson (2010), p. 20.
- ⁹⁹ Wilson (2010), p. 9.
- ¹⁰⁰ Wilson (2010), p. 27.
- ¹⁰¹ Wilson (2010), p. 22-23, 26.
- ¹⁰² Wheeler (1877a), p. 211-312, 443-448.
- ¹⁰³ Wilson (2010), p. 26.
- ¹⁰⁴ Wheeler (1873), p. 1,212, *in* Secretary of War (1873).
- ¹⁰⁵ Wheeler (1877b), p. 1,218, *in* Secretary of War (1877).
- ¹⁰⁶ Wheeler (1875), p. 964, *in* Secretary of War (1875). “Meandering” refers to the method of mapping by taking bearings and measuring distances along the route traveled.
- ¹⁰⁷ Wheeler (1875), p. 952-958, *in* Secretary of War (1875).
- ¹⁰⁸ Wheeler (1877b), p. 1,251, *in* Secretary of War (1877).
- ¹⁰⁹ Wheeler (1879), p. 1,982, *in* Secretary of War (1879).
- ¹¹⁰ Macomb (1885), p. 11, Table I.
- ¹¹¹ Macomb (1885), p. 12, Table II.
- ¹¹² Annand (1979), p. 5.
- ¹¹³ Annand (1979), p. 5.
- ¹¹⁴ R. Autobee, written commun., email of March 22, 2010.
- ¹¹⁵ Gambrill (1980), p. 1.
- ¹¹⁶ G. Williams, written commun., email of March 3, 2010.
- ¹¹⁷ R. Autobee, written commun., email of March 22, 2010.
- ¹¹⁸ R. Autobee, written commun., email of June 22, 2009.
- ¹¹⁹ R. Autobee, written commun., email of March 22, 2010.
- ¹²⁰ W. Wilson, written commun., email of February 2, 2011, to S. Boktor; W. Wilson, email of February 23, 2011, to O. Martinez.
- ¹²¹ S. Boktor, written commun., email of February 22, 2011.
- ¹²² J. Eickelman, written commun., email of March 17, 2011.
- ¹²³ W. Wilson, handwritten notes of telcon with R. Annand, March 29, 2011; R. Annand, written commun., emails of March 30, 2011, and June 26, 2013.
- ¹²⁴ R. Annand, written commun., email of March 30, 2011.
- ¹²⁵ R. Annand, written commun., email of June 26, 2013.
- ¹²⁶ R. Annand, written commun., email of June 26, 2013.
- ¹²⁷ S. Hamric, written commun., email of March 8, 2011.
- ¹²⁸ C. Stratton, written commun., two emails of March 10, 2011.
- ¹²⁹ T. Morgan, written commun., email of March 14, 2011.
- ¹³⁰ G. Williams, written commun., handwritten note, received May 16, 2011.
- ¹³¹ M.J. Brodhead, written commun., email of April 27, 2011.
- ¹³² D. Mrocykowski, written commun., email of May 25, 2011.
- ¹³³ R. Gainer, written commun., email of June 9, 2011.
- ¹³⁴ R. Gainer, written commun., email of August 1, 2011.
- ¹³⁵ C. Rivero-deAguilar, written commun., undated letter sent as attachment to email of W. Thomas, February 18, 2011.
- ¹³⁶ W. Wilson, written commun., emails of July 31, 2011, to C. Rivero-deAguilar and R. Gainer.
- ¹³⁷ W. Wilson, written commun., email of August 1, 2011, to S. Ruhnke.
- ¹³⁸ S. Ruhnke, written commun., email of January 20, 2012.
- ¹³⁹ S. Ruhnke, written commun., email of April 30, 2012.
- ¹⁴⁰ S. Ruhnke, written commun., email of April 30, 2012.
- ¹⁴¹ Gambrill (1980).

¹⁴² Gambrell (1980), p. 16.

¹⁴³ L. Green, written commun., email of April 1, 2011.

¹⁴⁴ Useful references are Dewing (1964) and Dawdy (1993).

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