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Running the Line: James Henry Martineau's Surveys in Northern Utah, 1860-1882

By NOEL A. CARMACK



The rectangular land survey system established by the congressional land ordinance of May 20, 1785, set into motion a wave of exploration programs to measure, divide, and map public lands in America. These ventures produced various types of maps describing jurisdictional boundaries, topographic features of the land, military reconnaissance and campaigns, and special thematic profiles of the geography. Cadastral surveyors, under the direction of the General Land Office (GLO), surveyed township and section lines by magnetic compass (or, later, by solar compass) and measured the lines with lengths of chains. Topographical engineers, under the direction of the Army Corps of Engineers, described and charted the land's elevations, its physical features, and the courses of its waterways. County surveyors, under the direction of territorial surveyors general, laid out townsites to define lots and distribute them to oncoming settlers. All of these surveyors and engineers produced a cartographic legacy as they explored the frontier, described arable regions, and laid the foundation for the orderly disposal of public lands.¹

This A. J. Russell photograph shows a survey party under difficulties in Weber Canyon, 1868. Although it is difficult to identify the figures in the photo, it may well be a crew that included James Martineau.

Noel A. Carmack recently co-edited with Karen Lynn Davidson the book *Out of the Black Patch: The Autobiography of Effie Maquess Carmack, Folk Musician, Artist, and Writer*. He wishes to gratefully acknowledge Mollyanne Hopkins, Kirby Martineau, and Preston Ward for their assistance with this article.

¹ For an excellent historical overview of cartographic activities and public land surveys in America, see Ralph E. Ehrenberg, "Taking the Measure of the Land," *Prologue* 9 (Fall 1977): 129-50. On the historical development of the rectangular system of surveying, see Lowell O. Stewart, *Public Land Surveys: History, Instructions, Methods* (Ames, IA: Collegiate Press, 1935); John B. Cleary, *United States Land Surveys*, pts. 1 and 2 (Scranton, PA: International Textbook Company, 1943); William B. Pattison, *Beginnings of the American Rectangular Land Survey System, 1784-1800* (Chicago: University of Chicago Department of Geography, 1964); and C. Albert White, *A History of the Rectangular Survey System* (Washington: U.S. Department of the Interior, Bureau of Land Management, 1983).

One of these surveyors and engineers was James Henry Martineau, a Mormon pioneer and civic leader in Utah. Martineau's cartographic activities during the White Mountain Expedition have been well documented by Carl Wheat, Juanita Brooks, and Clifford Stott.² While in southern Utah, Martineau served as clerk of the LDS Parowan Ward and as military adjutant and clerk of Iron County. Following the initial surveys of Parowan Fort and Cedar Fort by William H. Dame, Martineau extended these townsite surveys and surveyed large tracts near Summit and Johnson's Fort. But his survey work in northern Utah is by far his most impressive. The value of that work should be weighed along with the noteworthy man who drew the lines.

James Henry Martineau was born March 13, 1828, in Amsterdam, Montgomery County, New York, the son of John Martineau and Eliza Mears. His father had been educated as a physician and surgeon but later became chief engineer for New Jersey's Camden and Amboy Railroad. John Martineau also invented the central discharge waterwheel and a horse-powered threshing machine that replaced the flail, or the treading out of grain by horses or cattle. And he engineered several important bridges in New York and New Jersey.

Upon graduation from New York's Monroe Academy, James H. Martineau became a compositor and pressman before enlisting in the army to serve during the Mexican War of 1846. After filling various capacities on detached service until his honorable discharge in July 1848, Martineau started for California during the Gold Rush of 1849. He paused in Utah Territory, however, to teach school in Farmington during the winter of 1850. He never left; the next year, he joined the Church of Jesus Christ of Latter-day Saints (LDS church). The new convert was soon called to help survey townsites in the newly organized Iron County Mission.³ On January

² The White Mountain Expedition was an exploring party that, as part of Brigham Young's "Move South," searched for sites in eastern Nevada as possible sanctuary settlements for Mormons retreating from government forces during the Utah War of 1857-58. See Carl I. Wheat, *Mapping the Transmississippi West, 1540-1861*, 5 vols. (San Francisco: Institute of Historical Cartography, 1957-63), 4:126-35; Juanita Brooks, "A Place of Refuge," *Nevada Historical Society Quarterly* 14 (Spring 1971): 13-24; and Clifford L. Stott, *Search for Sanctuary: Brigham Young and the White Mountain Expedition* (Salt Lake City: University of Utah Press, 1984).

³ For biographical information on James Henry Martineau, see James H. Martineau, "Col. James H. Martineau," in Edward Tullidge, *Tullidge's Histories: Northern Utah*, 2 vols. (Salt Lake City: Juvenile Instructor's Office, 1889), Biographies Supplement, 2:68-79; Andrew Jensen, *LDS Biographical Encyclopedia*, 4 vols. (Salt Lake City, 1901; reprint, Salt Lake City: Western Epics, 1971), 4:156-59. See also James H. Martineau Journal, 1859-1860, holograph (MS 320), Archives Division, Historical Department, Church of Jesus Christ of Latter-day Saints, Salt Lake City, Utah (LDS Church Archives), and James Henry Martineau Autobiography, 1828-1908, typescript, Special Collections Division, Harold B. Lee Library, Brigham Young University, Provo, Utah (BYU Special Collections).

Perhaps because Martineau was adjutant to Col. William Dame, who commanded the militiamen who perpetrated the Mountain Meadows Massacre, many people have alleged that Martineau was involved in the massacre. However, several sources state that he was actually in a scouting party on the Sevier River when the massacre took place and that he learned of it upon his return to Parowan. See Joseph Fish, *The Life and Times of Joseph Fish, Mormon Pioneer*, ed. John H. Krenkel (Danville, IL: Interstate Printers and Publishers, 1970), 56-57; James Henry Martineau to Susan Ellen Martineau, May 3, 1876, LDS Church

8, 1852, he married Susanna (Susan) Ellen Johnson. Five years later, on January 18, 1857, he married under covenant of plural marriage Susan Ellen's cousin Susan Julia Sherman.⁴

Trained as an engineer while at the academy, Martineau followed in the tradition of federal cadastral surveyors who measured the land by observations on Polaris (the north star) or the sun. These public lands surveyors divided lands for private ownership; the divisions delineated townships by dividing land into one-square-mile sections, with thirty-six sections making one township.

While Martineau was living in Parowan, an act of Congress dated February 21, 1855, established the office of surveyor general of Utah Territory and set aside certain public lands for schools and universities. The first Cache Valley surveys were laid out in sixty-seven days by Frederick H. Burr, U.S. deputy surveyor, who ran five miles of line per day under Contract No. 6, dated July 15, 1856. The completed surveys were approved by David H. Burr, then U.S. surveyor general for Utah, at the Salt Lake City branch of the U.S. land office on September 27, 1856—at virtually the same time that Peter Maughan's first colonizing wagons were rolling into Cache Valley at the foot of the Wellsville Range.

Brigham Young was dissatisfied with the surveys. He alleged that David Burr was fraudulently charging the government for work that his contracted surveyors had not done or had done poorly. Burr denied this, saying that Mormon settlers were trespassing on public lands and surreptitiously removing corner markers in defiance of federal jurisdictional authority. However, given the extensive surveying reportedly completed by Burr's surveyors in other parts of the territory and the extent of poor marking that was later discovered, it is improbable that the survey inadequacies were caused by Mormons removing corner markers in a widespread, systematic manner. Regardless, it is evident that even GLO commissioner Thomas Hendricks was displeased with Burr's improper activities, and he censured Burr for excessive and unauthorized surveys. Feeling threatened by Mormon vigilantes, Burr and other federal appointees fled Utah on April 15, 1857. When Burr's replacement, Samuel Stambaugh, arrived in Salt Lake City in September 1859, his investigations revealed that the surveys were indeed inadequately marked. Ultimately, however, the early surveys of Utah settlements, including those in Cache County, remained largely uncorrected until the federal resurveys of 1875-78.⁵

Archives; and James H. Martineau to F. E. Eldredge, July 23, 1907, holograph, BYU Special Collections (MS 467).

⁴ Susan Ellen Martineau, *Autobiography, 1836-1918*, holograph, BYU Special Collections, and "Susan E. J. Martineau," *Young Women's Journal* 17 (December 1906): 541-42. Susan Ellen was the daughter of Joel H. Johnson and Anne Pixley Johnson; Susan Julia was the daughter of Lyman Royal Sherman and Delcena Diadamie Johnson. Martineau reportedly also married Mary Elvira Sherman and Jessie Helen Russell (or Grieve). But I have not been able to verify these marriages conclusively from available evidence.

⁵ For more on David H. Burr's activities, see C. Albert White, *Initial Points of the Rectangular Survey System* (Westminster, CO: Publishing House for the Professional Land Surveyors of Colorado, Inc., 1996),



Detail showing Cache Valley taken from "Map Showing the Extent of Surveys in the Territory of Utah, 1856, Examined and Approved this 30th Sept. 1856, Sur Genl. David H. Burr of Utah," Senate Exec. Doc. No. 5, 34th Congress, 3rd Sess.

Severe winters in Cache Valley frustrated Brigham Young's early plans to develop a herd ground there, but the valley's alluvial loam soils invited agricultural settlements along its fertile terraces and foot slopes. The valley, fed by the meandering Bear River and its tributaries, offered abundant sources of water for irrigated farms outside nucleated townsites. The division of farmland outside of the townsites was conducted by the territorial or county surveyor, but these surveyors measured from the corner markers of townships sections established by the earlier federal rectangular survey. The subdivision or farm surveys, as they were called, began in Cache Valley on January 21, 1859, when the valley's presiding bishop, Peter Maughan, appointed a committee of three men, John P. Wright, John Nelson, and Israel J. Clark, to see that the first tracts of land were surveyed and distributed equally.

The streets and lots within the boundaries of the first townsites (forts) were also surveyed by these appointed men. While the laying out of streets and lots within the primitive fort pattern was not dictated by a federally prescribed pattern, neither did they conform exactly to the typical grid pattern that has remained characteristic of Mormon settlements, and territorial surveyors later had to adjust the size and direction of lots. Wright, for example, surveyed the first streets in Logan from Main and Center to Fifth North. According to Melvin R. Hovey, "A meeting was held July 10, 1859, and it was decided that the boundaries of the settlement be set and also to name the place. The stakes which set off the boundary lines were driven by means of a pocket compass and the North star. John P. Wright laid off Main and Center Streets, as they are today."⁶ When territorial surveyor Jesse W. Fox extended the Logan Fort plat to conform to a traditional townsite pat-

311-25. For land surveys in Cache Valley, see Willis A. Tingey, "Early Land Surveys and Land Allotments in Cache Valley," in *Papers of the Cache Valley Historical Society*, Vols. I-II, 1951-1953, 29-36, typescript, USU Special Collections and Archives, Merrill Library, Utah State University, Logan, Utah (USU Special Collections). The original land surveys and field notes are deposited at the office of the Bureau of Land Management, Salt Lake City, Utah. A microfiche copy is held at the offices of the Cache County Recorder and the Cache County Surveyor, Logan, Utah. For information on the earliest surveys off the Salt Lake Baseline and Meridian, see Gustive O. Larson, "Land Contest in Early Utah," *Utah Historical Quarterly* 29 (October 1961): 309-25, and White, *Initial Points*, 305-30.

⁶ *Logan Journal*, October 13, 1923. See also Manuscript History, Logan Ward, Cache Stake, July 10, 1859, 3, microfilm copy, LDS Church Archives, and *Deseret News*, April 21, 1886.

tern on March 13, 1860, Henry Ballard reported that Fox had to adjust the size of lots, saying, "the Greatest Part of the Houses and Yards had to be moved."⁷ Logan LDS bishop William B. Preston then gave out lots and farmland to the arriving settlers.⁸

After removing to Salt Lake City in 1860 from Parowan, James Martineau was advised by Brigham Young to go to Logan, where he was needed as a surveyor. "On July 19th, I started to Cache County, to survey lands there, by desire of President B. Young," Martineau wrote.

While on the way, in company with Maj. S[eth]. M. Blair's company of settlers we heard that hostilities had broken out with Indians at Smithfield, in which two whites and one Indian were killed, and several wounded. We therefore traveled in military order, and reached Providence in safety, where I remained for some weeks, while making surveys in various portions of the county. I located my family in Logan, the county seat, and when the county was organized was appointed county clerk and elected county surveyor, which last position I held for over twenty years.⁹

Having brought Susan Julia and their children Delcina and Lyman with him to Logan, Martineau immediately began setting up a homestead on a lot north of the town square. Susan Ellen, who had temporarily remained in Manti visiting family, would arrive a few weeks later with the rest of the children. "We are all in pretty good health," he wrote to Susan Ellen, "though I have still a bad cold, contracted about two weeks ago while surveying. I have not yet got my houses completed, though I have used great endeavors to accomplish it. Everyone has been so busy, that help was hard to obtain, logs scarce, and everything else ditto." Although resources were scarce, Martineau tried to remain optimistic about his situation in Logan. "You did not marry me for riches, you used to say, and if you did, you shot wide of the mark. I hope however, that when once we are established in this valley, that prosperity will shine upon us. There will be considerable surveying to do, which will bring in something."¹⁰ For the next few months, Martineau assisted Jesse Fox and worked as a clerk for Farnsworth and Company and the Thomas Box Company. In July 1863 he began operating a photographic gallery, having earlier learned tintype, ambrotype, and

⁷ Henry Ballard Journal, March 11 and 13, 1860, 21, typescript, USU Special Collections; Ralph Smith Journal, March 13, 1860, holograph, USU Special Collections. Joel Hyrum Campbell remembered that "Some of the cabins on Center street had to be moved" (*Logan Journal*, May 24, 1924).

⁸ Joel Edward Ricks, *The Beginnings of Settlement in Cache Valley*, Twelfth Annual Faculty Research Lecture (Logan: Utah State Agricultural College, 1953), 15-17, 36.

⁹ *Tullidge's Histories*, Biographies Supplement, 2:74, and *LDS Biographical Encyclopedia*, 4:157. The "hostilities" had begun when the settlers killed Pagunap, a Shoshone leader. Martineau's activities as Cache County Clerk and county surveyor are documented in the Cache County court records, "A' County Book of the County of Cache Organized April 4, 1857," located in the office of the Cache County Recorder, Logan, Utah; typescript at USU Special Collections. A photocopy of his early county surveys and field notes, bound and entitled "Land Book, containing a record of surveys made in the County of Cache, dating from 1860," is located at USU Special Collections.

¹⁰ James H. Martineau, Logan, to Susan Ellen Martineau, Manti, December 5, 1860, holograph; unless otherwise noted, this and other items of correspondence are cited from the James Henry Martineau Collection (MS 4786) and James Henry Martineau Correspondence (MS 9532), LDS Church Archives.



James Martineau's sketch of the Logan settlement, sent to his wife Susan Ellen, January 12, 1861. From Anita Schwendiman, History of Nephi Martineau.

stereographic processes from Edward Covington of Ogden.¹¹

In addition to his appointment as county surveyor, Martineau held the offices of U.S. deputy internal revenue collector and as brigade adjutant of three full regiments in the Cache Military District. While serving in this capacity, he was a member of the staff of General Daniel H. Wells until the Nauvoo Legion was annulled in 1882. As adjutant and military

instructor, Martineau was involved in brigade musters, military exercises, parades, and predator control activities.¹² His military activities in Cache Valley are well documented. His reports on the Bear River massacre, for instance, are helpful in estimating the casualties of that tragic event.¹³ By 1865, Martineau had earned the rank of colonel in the Nauvoo Legion.

Martineau's experience in military tactics and diplomacy may have been helpful in maintaining peace between his wives. Naturally, one wife would occasionally express a tinge of jealousy when she perceived that the other

¹¹ Tullidge's *Historics*, Biographies Supplement, 2:75. See also "Early Pioneer Photographers," *Out Pioneer Heritage* 18 (1975): 249-305.

¹² See James H. Martineau, "The Military History of Cache Valley," *Tullidge's Historics*, 2:361-76; *Deseret News*, July 16, 1862, July 20, 1864, June 12, 1867, October 4, 1869; also, various entries in "Journal of Cache Military District, Reorganized August 5, 1865," [brigade muster rolls, returns, journal 1865-76], microfilm copy, USU Special Collections. The Nauvoo Legion was a Mormon-organized militia responsible for protecting the settlements. For more on predator control in Cache County, see Victor L. Sorensen, "The Wasters and Destroyers: Community-sponsored Predator Control in Early Utah Territory," *Utah Historical Quarterly* 62 (Winter 1994): 26-41.

¹³ See Martineau, "Military History of Cache Valley." A recently discovered map made by Martineau the day following the massacre provides casualty estimates and locations, as well as the position and tactical maneuvers of Col. Patrick E. Connor's men; see Scott R. Christiansen, *Sagwitch: Shoshone Chieftain, Mormon Elder, 1822-1887* (Logan: Utah State University Press, 1999), 48-52. For more on the casualties of the Bear River Massacre, see Brigham D. Madsen, *The Shoshoni Frontier and the Bear River Massacre* (Salt Lake City: University of Utah Press, 1985), 191-93, and Harold Schindler, "The Bear River Massacre: New Historical Evidence," *Utah Historical Quarterly* 67 (Fall 1999): 300-308.

was being favored. When a tiff arose, he advised conciliation and harmony. Ironically, while most of his thoughts seem to be directed to both of his wives, his letters are, in fact, addressed to Susan Ellen. This detectible show of favoritism may have exacerbated the already divisive tensions between the two women. In any case, when he was away, he regularly reported his activities to them and rejoiced in the family's times of concord.¹⁴

On January 12, 1861, for example, Martineau wrote to Susan Ellen describing the conditions at Logan:

The weather has not been very cold, except for a few days about Christmas. Sleighing is good, but I have not had much opportunity to enjoy it as yet, my time being much occupied with business. We are now living in our own house, next to Br. [Seth M.] Blair, whom I like very much.

The above sketch represents the plantation, looking to the north. On the left is the Tithing Stack Yard, next Susan's house, then yours, in the rear is the stable. On the right is Br. Blair's house. The well, which is about 11 feet deep, is in front. The following is a ground plan of the premises. The location is the first in Logan fronting south, and is situated in the handsomest part of town. Logan is a mile long and 5/8 of a mile wide, with lots containing an acre of land each. It is situated upon a beautiful bench about 20 feet high, along the south edge [of] which flows the Logan River, running west. The Logan is a most beautiful river, abounding in large trout, which the Indians sell cheap. I saw some for sale last week, freshly caught. So much for Logan.¹⁵

The situation at Logan was primitive, but Martineau looked forward to the development of resources at the young settlement: "I like this country very much," he continued.

It is none of your two-penny Parowan operations—all is on a larger scale. There will be a great deal of machinery here, saw mills, grist mills, carding machines, etc., which are now going ahead. As regards my affairs, I am pretty hard up. I have expended almost every thing for building, wood, hay and provisions, and have nothing left, but a span of small mules, wagon and carriage—no cow, pig, or chicken. I have been in debt nearly \$500 but have now paid almost all. I am about to commence teaching military tactics, which will, I hope, help to recruit my finances a little. I was desired to teach school, but declined. My public business is steadily increasing, and I seldom get to bed before 12 o'clock p.m.¹⁶

James Martineau knew well the toil and tedium of survey work. Laying out local townsite plats was arduous but not as isolating as other outdoor labor that kept him from his family. "The city engineer may at almost any

¹⁴ Several extant letters suggest that Susan Ellen and Susan Julia experienced the natural competitiveness that might have arisen between two women in a polygamous marriage. For example, on one occasion, Martineau expressed that Susan Ellen's perceived lack of interest in the welfare of Susan Julia implied that she "cared nothing for her." In another example, Susan Ellen evidently felt a tinge of jealousy when James Henry paid a little more attention to Susan Julia, saying that she thought he was "quite partial" and wished he would think of her more often. See James H. Martineau, Logan, to Susan Ellen Martineau, Manti, November 5, 1860; James H. Martineau, near Willard, to Susan Ellen, Logan, August 23, 1868; and Susan Ellen Martineau, Logan, to James H. Martineau, near Corinne, September 11, 1868, as published in Anita Martineau Schwendiman, *Family History of Nephi Martineau and Emmeline Knowles Martineau* (Newdale, ID: author, 1987), 255, 267, and 269.

¹⁵ James H. Martineau, Logan, to Susan Ellen Martineau, Manti, January 12, 1861, typescript as published in Schwendiman, *Family History of Nephi Martineau*, 257.

¹⁶ *Ibid.*, 259.

hour get a drink of cold water, something to eat, or shelter from a storm, and, at night, rest in his own comfortable home," he wrote. His topographical work, on the other hand, often took him to the far reaches of the territory and involved climbing hazardous cliffs, traversing scorched desert expanses, and bushwhacking through thickly vegetated valleys and canyons. He observed, "The surveyor goes in advance of civilization. He traverses the wilderness and the deserts, as the foremost drop of spray of advancing tide, as it encroaches upon the shore. And so his work, of necessity, carries him away from the comforts of home."¹⁷

While surveying townsites throughout Cache Valley during the 1860s, Martineau kept in weekly contact with his wives and children. During the spring of 1869, for instance, Susan Ellen wrote to him from Logan, expressing her concern for his welfare as he extended townsite surveys in the southern part of the valley. "I am glad that you can sleep in town at night so I will not feel so worried about you. I am glad you don't have to go out of this valley, for now I have some chance of hearing from you. Write every possible chance and let us know of your whereabouts. Don't fail for I would like to hear from you every day if I could!"¹⁸ Six days later, Martineau reported his location and activities by writing, "I finished at Mendon yesterday and got here last night. Today I go to Hyrum which I expect to be about three days, thence to Millville, Providence and to Logan, where I hope to see you by Sat. or Sunday next. I have been well since leaving home, but very busy."¹⁹

Occasionally, when he found quiet moments alone, away from his assistant surveyors and chainmen, Martineau wrote poetry to keep his thoughts filled with family and worship. In October 1867, for example, while surveying Malad City, Idaho, the valley's evening light reminded him of departed loved ones:

How many tried and trusted friends are gone!
 How many times our aching hearts have bled!
 How oft an old and half-remembered song
 Hath brought to mind those scenes forever fled!
 And time is passing still. To-day will be
 Soon numbered with the shadowy, silent past,
 While rush we on towards eternity
 That stretches out so broad—illimitable—vast.²⁰

Though poetry provided Martineau creative affirmation away from home, it did not allow him to elude the challenges he faced in the field.

¹⁷ [James]. H[enry]. Martineau, "An Engineer's Tribulations" *Contributor* 12 (June 1891): 317-18.

¹⁸ Susan Ellen Martineau to James H. Martineau, April 29, 1869, LDS Church Archives; also published with the incorrect date of April 27 in Schwendiman, *Family History of Nephi Martineau*, 270.

¹⁹ James H. Martineau, Wellsville, to Susan Ellen Martineau, Logan, May 4, 1869, LDS Church Archives; also published in Schwendiman, *Family History of Nephi Martineau*, 271.

²⁰ "Twilight Memories," in *Tullidge's Histories*, Biographies Supplement, 2:76. For more of his poetry, see "Sabbath Bells," *idem*, 2:77-78; "The Title of Liberty," *Contributor* 11 (June 1890): 312-13; "Boyhood's Days," *Contributor* 12 (January 1891): 113; and "Rest," *Improvement Era* 5 (September 1902): 880.

Evidently, it was difficult to apply the rectangular survey system upon the existing Mormon fort style settlement pattern. On at least three occasions, Martineau had to modify the typical eight one-acre lots per block in order to superimpose the usual uniformly divided gridiron upon original settlement configurations and the valley's growing populace. The early Mormon form of settlement with houses facing each other and walled fort protection forced him to adjust the size and number of lots according to the number of inhabitants and the physical layout of the fort. For example, he surveyed ten lots to the block in the Smithfield and Weston townsites rather than the normal eight because there was a higher population of settlers in these communities than could be accommodated by fewer lots. In Providence, he increased one-acre lots to 1.35 acres in order to match the larger existing blocks within the stone walls of the fort.²¹

When, as a newly elected surveyor, Martineau had begun work in 1860,²² the townsites of Logan, Hyrum, Wellsville, Mendon, Smithfield, and Richmond had already been established by John P. Wright and others and had been partially extended by territorial surveyor Jesse W. Fox. However, a close examination of modern Cache County plat maps reveals that townsite grid lines were misaligned as much as 1° 43' east of the true meridian. It would have been extremely difficult for Martineau and Fox to correct the inaccurate alignment of existing forts, since the streets and lots had already been laid out and settled upon with permanent structures.

The accuracy of the first fort surveys in Cache Valley could have been affected by any number of human or mechanical errors. According to traditional surveying methods, it was imperative that the length of every line be ascertained by precise horizontal measurement, approximating an air line as nearly as possible. This required the chainmen to keep the chain stretched and to plumb the tally pins so as to attain precisely the spot where they should be stuck for a true measurement. When the surveyors ascended or descended hills or mountains, the chain would have to be shortened in order to accurately give the true horizontal measure. Error in measurement was always a possibility.

Mistakes could also arise through calculation errors. At a given latitude, the surveyor had to ascertain the true meridian by observing Polaris and gauging the azimuth by the star's greatest eastern or western elongation for that particular time of day and month of the year. If the surveyor did not use a theodolite to find the true meridian, he had to determine, by compass, the variation or declination between magnetic north and true north. The azimuth plus the angle between magnetic north and the pole star

²¹ See various early town plats in "Land Book, containing a record of surveys made in the County of Cache." For more on the Mormon form of townsite planning, see Richard H. Jackson, "The Mormon Village: Genesis and Antecedents of the City of Zion Plan," *BYU Studies* 17 (Winter 1977): 223-40.

²² "'A' County Book of the County of Cache Organized April 4, 1857," August 15, 1860, 13, typescript, USU Special Collections.



*James H. Martineau's plat map
of Paradise City, Cache County,
August 31, 1867.*

would provide the data from which true north could be determined. Also, because magnetic declination varies over the course of the year, a surveyor determined the mean magnetic meridian by averaging the needle points west or east of the magnetic meridian for a given time of day for the four seasons of the year. This calculation was aided by declination tables in the surveyor's manual.²³

The accuracy of surveys, then, depended on the care with which the surveyor

used his instruments and his fastidiousness in calculating the magnetic variations. If, however, the instruments were miscalibrated or if primitive instruments were being used—the latter being the likely case for the earliest Cache Valley fort surveys—the gridlines would be consistently misaligned even beyond the usual variations. Since, according to available descriptions of the first surveys, a pocket compass and tape measure were often the only available means of laying out forts, it is not surprising that the gridlines of later surveys and townsite extensions were misaligned.²⁴

The fact that Martineau tried to correct previous misalignments and missing township corner markers shows his desire to achieve accuracy. As early as March 1870 he made at least one unsuccessful plea for federal resurveys in Cache Valley to reestablish obliterated corners.²⁵ His plats indicate several adjustments to Fox's initial range line variations. In September

²³ See the 1855 instructions to surveyors as published in C. Albert White, *A History of the Rectangular Survey System*, 457–500.

²⁴ John Fish Wright, son of John P. Wright, remembered the initial town (fort) survey of Logan: "Father laid out the town site with a compass in July 1859. Measurements were made with a tape line. Jesse Fox went over his work the next year but didn't change it"; *Logan Journal*, January 26, 1923. While Fox may not have changed the cardinal direction of streets, cabins and lot boundaries had to be moved from the typical fort layout to a conventional townsite pattern. See Ricks, *The Beginnings of Settlement*, and A. J. Simmonds, "Fort was a Special Form of Valley Settlement," *Logan Valley*, January 16, 1978, 3.

²⁵ Joseph Wilson to C. C. Clements, April 14, 1870, #154, Letters Received, Correspondence of the Surveyors General of Utah (hereafter cited CSGU), Records of the Bureau of Land Management, Record Group 49 (hereafter cited BLM49), National Archives, Denver, CO; Nathan Kimball to James H.

1879, for example, Martineau surveyed the lower Providence canal, running the courses "with 11° 30' variation east, being 5° 00' less than that of the local surveys of J.W. Fox."²⁶ His reputation for exactness must have gone beyond Utah. Martineau's survey work was requested for semi-official territorial maps by commercial mapmaker Bernard A. M. Froiseth and for triangulations in official reports of the Smithsonian Institution.²⁷

Indeed, the integrity of his work ethic led to more employment as engineer and surveyor in the undocumented regions of northern Utah. In July 1868 Samuel B. Reed, superintendent of the construction of the Union Pacific Railroad, sent for Martineau to assist in surveying the rail line from the head of Weber Canyon to Humboldt Wells, Nevada, under the direction of Jacob Blickensderfer, Jr.²⁸ In an effort to speed up grading and track laying, the railroad's chief engineer, General Grenville Dodge, ordered the survey line to Humboldt Wells completed in three months. As it turned out, the survey of this line was perhaps the most rigorous of the route between Green River and the barrens west and north of the Great Salt Lake. Beginning near Lost Creek in Weber Canyon, Martineau and other men in his party experienced a difficult time laying out the chains along the swollen river. "Sometimes the head chainman, wading in water perhaps a foot deep, would suddenly disappear from sight for a few minutes," Martineau remembered,

but his sputtering "remarks" would soon make known his locality as he arose from the bottom of some gulch into which he had stepped, its depth hidden by the muddiness of the water. Our natural desire to laugh at his misfortune was checked by the thought that we, too, must follow where he had led, and get a similar ducking....

One day, our line ran along the precipitous face of a rock about eighty feet above the roadway beneath it; but a narrow ledge a foot wide, and extending some two hundred feet to a big cliff, seemed to offer a sufficient pathway to our fearless chainmen, and they determined to try the dangerous route. They climbed to the ledge, and slowly proceeded along it, stepping sideways step by step, we, who were below, looking on

Martineau, December 26, 1876, 150, and C. H. Cranwell to James H. Martineau, May 4, 1877, 242, Kimball's Record of Letters Sent, CSGU, BLM49.

²⁶ Martineau, "Land Book containing a record of surveys made in the County of Cache," 284. When he finished the upper Providence canal the same month, he ran the courses "with 15° 00' variation east, this being 1° 30' less than that of the local surveys made by J. W. Fox Sen. in the surveys of farm land adjoining"; *idem*, 286.

²⁷ B. A. M. Froiseth to James H. Martineau, June 3, 1874, LDS Church Archives. See also Michael Edmonds, "The U.S. General Land Office and Commercial Map Making: A Case Study," *Government Publications Review* 13 (September-October 1986): 571-80. Martineau's topographical work was used in triangulations taken near Promontory and Brigham City; Jacob Blickensderfer, Jr., to Brigham Young, February 10, 1875, and James Blickensderfer, Jr., to James H. Martineau, March 5, 1875, LDS Church Archives.

²⁸ U.S. Congress, "Report Chief Engineer of Union Pacific Railroad," House Exec. Doc. No. 132, 41st Congress, 2nd Session (Washington: Government Printing Office, 1870), 7-14, 33-45. See also Robert G. Athearn, "Contracting for the Union Pacific," *Utah Historical Quarterly* 37 (1969): 16-40, and Alan H. Grey, "Roads, Railways, and Mountains: Getting Around in the West," *Journal of the West* 33 (July 1994): 35-44. Humboldt Wells is an area of springs near what is now Wells, Nevada.



with some anxiety, when the leader, James Larkins, was seen to convulsively clutch the rocks as he shouted out, "I'm going to fall!"²⁹

Larkins and his chainmen survived the harrowing incident, but the danger in scaling sheer rocks portended the difficulties the group would experience farther along the line.

On Sunday, August 23, 1868, Martineau reported his labors and whereabouts to his wife Susan Ellen from a camp five miles south of Brigham City:

I do not yet know whether my pay will be more than \$50 per month or not. I think it will not. But I am doing well learning practical engineering, and am well thought of by Mr. Blickensderfer, the Engineer who has charge of the road from Green River to Humbolt. He told me lately that I was doing well, which from him, is saying much. He is difficult to please, but I like him very well. He and Genl. Dodge passed us a few days ago and have preceded us to the west.³⁰

Martineau was a quick learner, but the work ahead was ominous: "Tomorrow we finish this part of the line," he wrote, "which we have run from the mouth of Weber, and will start for the desert, going about 75 miles west of Bear R[iver] Bridge to recommence operations."³¹ Martineau knew that his party would have to endure the heat of the desert. Water and provisions would be rationed. Communications between him and his family would be difficult.³²

²⁹ Martineau, "An Engineer's Tribulations," 319. See also Grenville M. Dodge, *How We Built the Union Pacific Railway* (Council Bluffs, IA, n.d., c. 1910.; reprint, Denver: Sage Books, 1965), 22-24, 92-93. For an excellent treatment of Dodge's report on surveying the line to Humbolt Wells, see Charles Edgar Ames, *Pioneering the Union Pacific: A Reappraisal of the Builders of the Railroad* (New York: Appleton-Century-Crofts, 1969), 265-68.

³⁰ James H. Martineau, Willard, to Susan Ellen Martineau, Logan, August 23, 1868, as published in Schwendiman, *Family History of Nephi Martineau*, 267.

³¹ *Ibid.*

³² James H. Martineau, Perry, to Henry Martineau, near Ogden, August 22, 1868, and James H. Martineau, Perry, to Susan E. Martineau, Logan, August 23, 1868; Martineau, "An Engineer's Tribulations," 320.

Martineau is second from left, front row, in this photo of the Thomas B. Morris surveying party taken in 1868. From Grenville Dodge, *How We Built the Union Pacific Railway*.

By late September, Martineau and his fellow surveyors would experience much suffering “from thirst, and from inflammation [*sic*] of the eyes and partial blindness, caused by the intense glare of the sun upon the salt-encrusted plains.” Years later, Martineau remembered the hardships his party experienced while traversing the desert west of the Great Salt Lake:

While with Thos. B. Morris' party, Union Pacific engineers, locating the line of railroad about two hundred miles west of Ogden, we got out of provisions—had nothing left but a little corn meal and some vinegar—not a morsel besides. Our supply teams had got delayed, and we were, as the boys put it 'out of grub.' So we laid by one day, and every man except one or two, went out to kill a few rabbits or birds. Fifteen men started out, armed mostly with pistols, and after travelling about twenty-five or thirty miles each, in as many directions, returned at night to camp one by one, tired, hungry, thirsty—and empty handed. Not a man had seen a rabbit or bird, but each fondly hoped the others had.³³

Obtaining food for a hungry team of surveyors was only one of many problems faced by crew chiefs and superintendents in the West Desert.

In a letter to his “wives” dated September 25, 1868, Martineau described the expeditious activity near the Pequop Mountains: “We have nearly finished locating the road to the Humbolt Wells and then we shall work back again making some alterations as we go.... Men and teams are coming on here by the hundred from the terminus of the Railroad, and today some were here ready to go to work as soon as the work can be staked out.” As he worked, Martineau’s thoughts often turned to his family. Near the end of this letter, he told of his loneliness and memories of his beloved children, including a young daughter, Delcina, who had died three years earlier.

When I am out on the line by myself, taking my notes of topography to make my map, I always think of those most dear to me on Earth, and of those absent—in heaven. At such times I delight to sing, ‘Oh Della’ lle [?] and ‘What is home without a mother,’ Della’s last song (on Earth). I do not feel melancholy, but delight to think of the absent, and shed a few bitter-sweet tears.³⁴

A few days later he wrote, “We are in what we call a ‘dry camp’—that is, no water, except what we had in our barrels. We use four large barrels a day, which has to be hauled 15 miles. There are 18 in our party, and four wagon[s] with two span of mules to each wagon except one, which has two.”³⁵ By mid-November, Martineau reported that nearly all the work crews had converged near the promontory, where grading and side-cutting were proceeding with haste.³⁶

After his work on the Union Pacific line, Martineau continued his Cache County surveys until the latter part of May 1869, when he had the opportunity to contract with the Utah Central Railroad and work under the supervision of Jesse W. Fox. With hearty recommendations from

³³ Martineau, “An Engineer’s Tribulations,” 319-20.

³⁴ James H. Martineau to “Wives,” September 25, 1868, LDS Church Archives.

³⁵ James H. Martineau to Susan Ellen Martineau, October 1, 1868, LDS Church Archives. Also James H. Martineau to Elvira Martineau, October 12, 1868.

³⁶ See *Deseret News*, November 19, 1868.

Thomas B. Morris and James Blickensderfer, Martineau began surveying a portion of the line between Ogden and Salt Lake.³⁷ He was given charge of a survey party made up of his son Henry, Charles Hardy, Edward and Oscar Hunter, Calvin Richards, and an unnamed cook. Their assignment was to survey the line from Kay's Creek, which runs between Layton and Kaysville, to Bountiful. On June 10 Martineau wrote to Susan Ellen, saying,

We have located about thirteen miles from Ogden and expect to be at Kays Creek (Prairie House) by to night. We have thus far got a good line, nowhere ascending more than 40 feet in a mile which is a very easy grade. After we get as far as Farmington, it will be an easy matter to locate the rest of the line. Men are now at work all along between here and Ogden.... If any business letters, or books come for me by mail, send them to me by mail, especially 'Henek's field book of Engineering' which I have sent for, and need every day.³⁸

By June 22 the survey party had reached Farmington, and Martineau anticipated approximately ten more days of work before he would reach Bountiful, at which time he could return to his farm, his county surveying, and his photo gallery business in Logan.³⁹

The economic advantages of building a railroad line north to the Montana mines was of great interest to investors in Cache Valley. William B. Preston of Logan proposed to LDS church authorities that they build a Utah Northern railroad extension to Soda Springs, Idaho, in addition to the Ogden and Corinne branch lines they were already constructing. Brigham Young approved; he appointed his son John W. Young to lead the effort and directed local stockholders to obtain funds and organize labor. Thus, the Utah Northern Railroad Company was organized on August 23, 1871, with seventeen leading businessmen and church leaders of northern Utah as directors. After John W. Young's groundbreaking ceremonies on August 26, Martineau was asked to survey the Utah Northern Railroad line from a point north of Brigham City to Soda Springs, Idaho. His crew ran the line along the western slope of the Wellsville Range for twenty miles until it reached the hills at Collinston. Martineau's proposal to run the line through Bear River Gorge, however, was overruled by UNRR directors who favored a route over the Mendon Divide to Logan and on to Franklin. "I made several personal reconnoissances [*sic*] through the [Bear River] pass myself, and was certain the road could have been constructed at much less expense than the present line, and without its present heavy gra-

³⁷ Signed recommendation by Thomas B. Morris and Jacob Blickensderfer, January 5, 1869, Martineau Collection, LDS Church Archives. For information on the building of the Utah Central Railroad, see Gustive O. Larson, "Building of the Utah Central: A Unique Cooperative Enterprise," *Improvement Era* 28 (January 1925): 217-27, and Leonard J. Arrington, *Great Basin Kingdom: An Economic History of the Latter-day Saints, 1830-1900* (Lincoln: University of Nebraska Press, 1958), 270-75.

³⁸ James H. Martineau to Susan Ellen Martineau, June 10, 1869, as published in Schwendiman, *Family History of Nephi Martineau*, 260.

³⁹ James H. Martineau to Susan Ellen Martineau, June 22, 1869, and James H. Martineau to Susan Ellen Martineau, July 17, 1869, LDS Church Archives. See *Deseret News*, June 16, 1869, and December 26, 1919.

dient of one hundred feet per mile, and without trouble from snow," he wrote.⁴⁰

During his employment on the Utah Northern Railroad, Martineau continued working on his farm and in his photographic gallery during periods of seasonal down time, but the panic of 1873 seemed to affect him as it did other laborers in the territory. From Logan he wrote to his son Henry, "I have no money, not a cent. nor can I get any. It is hard times here and no money at all. I will send some if I can possibly get any. I wish you were all here, instead of being so far away."⁴¹ The poor health of his wife Susan Julia intensified his difficulties. According to Martineau, Susan Julia was suffering from heart and liver disease. During this troubled period, as Susan Ellen was visiting relatives in Hillsdale, Martineau stayed by Susan Julia's side with the help of his daughter Elvira and son Lyman. Unfortunately, her health rapidly worsened, and she died on January 29, 1874. A week later, on February 10, 1874, Susan Ellen wrote to her husband, "Oh James, it seems so hard to be so far away from you and cannot help you or be a comfort to you in your time of need. I don't know how we will do without Susan for her children's sake. They need a mother's care. I will try to be a mother to them."⁴² Whatever division the women may have experienced by the dynamics of polygamy, the family was drawn together by Susan Julia's death and the financial hardships the Martineaus faced then and later.

Among his other ventures, Martineau would be employed in further work relating to surveying in Cache County. In July 1875 GLO commissioner Samuel S. Burdett issued rules for the subdivision of quarter-sections and the restoration of lost corners in the territory. Andrew J. Stewart began a resurvey of Cache Valley under contract No. 66, dated October 14, 1875, but he soon discovered that in the valley, as in other parts of the territory, the original corner markers were lost or obliterated.⁴³ At that time, deputy surveyors relied on original field notes to reestablish corner markers and township boundary lines. But, as chief clerk T. Burgess of the Salt Lake district land office later reported, when Stewart began his survey using the field notes of Frederick Burr,

...he failed to find more than *one* corner or other mark to indicate that the land had been surveyed by the [federal] government. The testimony of others and my own observation in other parts of the territory give color to Mr. Stewart's opinion that the

⁴⁰ *Deseret News*, November 29, 1871, and August 7, 1872.

⁴¹ James H. Martineau, Logan, to Henry Martineau, Salt Lake City, January 2, 1874, LDS Church Archives.

⁴² James H. Martineau, Logan, to Susan Ellen, Hillsdale, March 5, 1874, LDS Church Archives; Susan Ellen Martineau, Hillsdale, to James Henry Martineau, Logan, February 10 and 11, 1874, as published in Schwendiman, *Family History of Nephi Martineau*, 279. See Mary Ann Weston Maughan Journal, January 29, 1874, 37, typescript, USU Special Collections.

⁴³ Nathan Kimball to J. A. Williamson, October 27, 1876, 110-14, Kimball's Record of Letters Sent, CSGU, BLM49. Although the rules for subdivision and restoration were set in place in 1875, a circular was not formally issued until November 1, 1879.

original surveys in Cache Valley were not made in accordance with law or as represented in the official field notes. In short, Mr. Stewart and others are of the opinion that certain unavoidable lines were run in a manner, and the rest only in the imagination of the person writing the field notes.⁴⁴

The original survey was so grossly marked that the situation caused Stewart to commit an infraction of his duties by surveying the townships surrounding those stipulated in his contract in order to close corners on his assigned surveys.⁴⁵

There were other survey problems in the valley. Following the opening of the Salt Lake district land office in 1869, a flurry of public land surveys took place in the territory. For example, in August 1871 deputy surveyor J. Lewson Smith began resurveys of Cache Valley. But the ambiguity of the 42nd parallel made it difficult for settlers in Townships 14 and 15 N., bordering Utah and Idaho, to legally describe their homestead boundary lines. Until this time, the inhabitants of towns as far north as Oxford were claiming residency in Utah Territory. After years of dispute over the line between the jurisdictions of Oneida and Cache counties, deputy surveyor Daniel G. Major resurveyed the forty-second parallel between August 29 and October 8, 1871, to reconcile Utah's territorial boundary on the north.⁴⁶

The Townsite Act passed in 1867 and approved by the Utah territorial legislature in 1869 was another impetus for many townsite and farm surveys in Cache County. The act gave inhabitants of cities and towns the opportunity to acquire title to available public land within the boundaries of the townsite; by entering a townsite with the General Land Office, the town would be granted a federal patent enabling local officials to legally distribute lots. An official of the town, usually the mayor or probate judge, would enter claims on the parcels on behalf of individual settlers and hand out lots according to the territorial laws governing public land disposal. According to Utah Territory law, homesteaders in Cache Valley had to clearly define their land boundaries before securing title by cash entry or by preemption.⁴⁷

Although the townsite survey was not tied to the federal survey, the federal survey was critical in determining available public lands outside the

⁴⁴ T. Burgess to Maurice M. Raigher, November 4, 1876, 360-64, Kimball's Record of Letters Sent, CSGU, BLM49.

⁴⁵ Nathan Kimball to J. A. Williamson, October 27, November 22, 110-114, 137, Nathan Kimball to A. J. Stewart, December 18, 1876, 144, and Nathan Kimball to James H. Martineau, December 26, 1876, 150, Kimball's Record of Letters Sent, CSGU, BLM49.

⁴⁶ For more on the northern Utah and southeastern Idaho boundary dispute, see Oscar Sonnenkalk, *Reminiscences of Oscar Sonnenkalk, Idaho Surveyor and Pioneer*, edited by Peter T. Harstad (Pocatello: Idaho State University Press, 1972), 1-3.

⁴⁷ See "An Act for the Relief of the Inhabitants of Cities and Towns upon the Public Lands," *Statutes at Large of the United States*, 14:541-42, and Public Land Commission, "The Public Domain: Its History with Statistics," *House Exec. Doc. 47*, Pt. 4, 46th Congress, 3rd Sess. (Washington: Government Printing Office, 1881), 298-305. See also George W. Rollins, "Land Policies of the United States as Applied to Utah to 1910," *Utah Historical Quarterly* 20 (July 1952): 239-51, and David L. Bigler, *Forgotten Kingdom: The Mormon Theocracy in the American West, 1847-1896* (Spokane, WA: Arthur H. Clark Co., 1998), 255.

townsite but within the section in which the townsite was located. Town councils in communities such as Logan, Richmond, Hyrum, Smithfield, Wellsville, and Mendon began collecting population counts and surveying the outer lines of their allotted townsite acreage. Thus, when the Logan city council met on August 16, 1869, Martineau was directed to make additional surveys of Logan City and surrounding farmlands to determine an exact boundary so that the mayor could obtain the townsite patent.⁴⁸

Later, when settlers contracted with local surveyors to survey their claimed tracts, it was obvious that Frederick Burr had not marked section corners as he had indicated in his field notes. In reaction, several citizens of Cache County sent letters to the surveyor general's office expressing dismay over the shoddiness of the initial 1856 survey.⁴⁹ By November 1877, the Cache County Court concluded that it was "considered advisable to get the plat and field notes of the whole survey of Cache County for the County Office."⁵⁰

Earlier that year, Martineau was working at the Salt Lake City surveyor general's office. According to the 1875 *Annual Report of the Commissioner of the General Land Office*, township plats became official only when they had been "examined as to correctness" and approved by the commissioner and Utah surveyor general.⁵¹ Due to the overwhelming number of mineral claims and resurveys conducted from 1875 to 1879, the surveyor general hired assistant draftsmen to draft duplicate maps, relieving some of the burden on Salt Lake district land office staff.⁵² Martineau was hired to duplicate and submit for acceptance Andrew Stewart's Cache County resurveys. He wrote,

Since I have been here, I have been very busy at the Surveyor General's office, mapping. Our work was lingering so much, that I thought best to go to work on our plats so that we could get them through, and perhaps get some pay before we die, if not sooner. Government work progresses so slowly—so much red tape. After we get the

⁴⁸ See "Record of Proof of Townsite Property, Cache County," September 4, 1871–July 30, 1909, holograph, USU Special Collections; Logan City Council Minutes, Volume "A," March 14, 1866–August 4, 1886, entries at August 16, 1869, and July 23, 1870, microfilm copy, USU Special Collections.

⁴⁹ Nathan Kimball to James H. Martineau, December 26, 1876, 150, Nathan Kimball to J. E. Hyde, Logan, October 5, 1877, 311, and T. C. Baily to James Mack, Smithfield, June 19, 1876, 183–84, Kimball's Record of Letters Sent, CSGU, BLM49. For a discussion of the effects of public land legislation on townsites in Utah, see Lowell "Ben" Bennion, "A Geographer's Discovery of 'Great Basin Kingdom,'" in *Great Basin Kingdom Revisited: Contemporary Perspectives*, edited by Thomas G. Alexander (Logan: Utah State University Press, 1991), 109–32.

⁵⁰ "'A' County Book of the County of Cache," June 4, 1877, 310.

⁵¹ The instruction to submit federal surveys to the surveying division (division E) was published as part of a reorganization of the General Land Office in 1875. However, in a circular issued April 17, 1879, Commissioner J. A. Williamson more specifically informed surveyors general that they could not file triplicate plats of surveys in local land offices until the duplicates had been examined and approved by the commissioner. See Department of the Interior, *Annual Report of the Commissioner of the General Land Office for the Fiscal Year Ending 1875* (Washington: GLO, 1876), 29 (hereafter cited *Annual Report GLO* with the year of the report), and White, *History of the Rectangular Survey System*, 154 and 509.

⁵² Nathan Kimball to J. A. Williamson, February 20, 1877, 185, and Nathan Kimball to J. A. Williamson, June 27, 1877, 476, Kimball's Record of Letters Sent, CSGU, BLM49.

plats all done and field notes accepted, it is still going to be a long time before the drafts come from Washington for payment. But I think all will come right in time.⁵³

During his time at the Salt Lake land office, Martineau noticed that the officials seemed to like his map work but appeared less than eager to have him working in the office with them. Despite Martineau's adeptness at mapmaking, it was unusual for deputy surveyors to be working alongside staff draftsmen. Such feelings of professional distinctions made for a less than amicable work environment. But by February 1 he wrote to Susan, "I could perceive it 'went against the grain' for me to come into the office for even a short time. I mean against the wish of the Chief and assistant draughtsman—but they seem to feel better about it now."⁵⁴

Later, on February 19, Martineau wrote, "I am still helping to work up our surveys, but it seems a long and tedious operation and I shall be very glad when we get through. I am very lonesome down here and do not enjoy myself at all except when at work in the office."⁵⁵ In addition to copying the Stewart surveys, Martineau requested that he be furnished with duplicates of the federal Cache Valley plats and field notes to provide reference for his farm surveys in the county. On June 27, 1877, he wrote to his wife that he had received word from Utah's surveyor general, Nathan Kimball, that he, with the help of his son Lyman, could proceed with copying the Cache Valley public surveys and field notes.⁵⁶

Under contract No. 80, dated August 30, 1877, Martineau began surveying portions of Cache County on the south and southeast, moving north toward Providence and Logan.⁵⁷ Beyond the usual questions regarding the reestablishment of lost corners, he apparently had little difficulty carrying out his contract. However, he and his colleague, deputy surveyor Augustus D. Ferron, discovered that sawmills had been built on public lands, and "great quantities of the most valuable timber" were being cut for purposes other than domestic fuel. Martineau and Ferron informed Nathan Kimball,

⁵³ James H. Martineau, Salt Lake City, to Susan Ellen Martineau, Logan, February 1, 1877, LDS Church Archives. At the quarter ending March 31, 1877, Martineau received \$208 for his work as "assistant draughtsman." At the fiscal year ending June 30, 1877, he received \$232 for his work in the Salt Lake district land office. See Nathan Kimball to J. A. Williamson, March 31, 1877, 216, Kimball's Record of Letters Sent, CSGU, BLM49, and *Annual Report GLO, 1877*, 309.

⁵⁴ James H. Martineau, Salt Lake City, to Susan Ellen Martineau, Logan, February 1, 1877, LDS Church Archives.

⁵⁵ James H. Martineau, Salt Lake City, to Susan Ellen Martineau, Logan, February 19, 1877, LDS Church Archives. On May 16–17, 1877, Martineau went to Logan to assist Jesse W. Fox in surveying the foundation for the Logan temple. See James H. Martineau, "Report on the Logan Temple," holograph (CR 308/21), LDS Church Archives.

⁵⁶ C. H. Cranwell to James H. Martineau, May 4, 1877, 242, Kimball's Record of Letters Sent, CSGU, BLM49. J. A. Williamson to Nathan Kimball, June 20, 1877, #56, Letters Received, CSGU, BLM49; James H. Martineau, Salt Lake City, to Susan Ellen Martineau, Logan, June 27, 1877, LDS Church Archives.

⁵⁷ Nathan Kimball to J. A. Williamson, September 1, 1877, 295, Kimball's Record of Letters Sent, CSGU, BLM49. In March 1879 Martineau received a total of \$6,500 for his work under Contract No. 80, which included Tps. 8, 9, 10, 11, and 12 N., Rs. 1 and 2 E and 1 and 2 W. For a more detailed description of Martineau's federal surveys in Cache County, see U.S. Dept. of the Interior, *Annual Report GLO, 1878*, 322, and *Annual Report GLO, 1879*, 875.

and Kimball reported the matter to the General Land Office in Washington. Commissioner Williamson instructed Martineau and Ferron, through Kimball, to inform the perpetrators that anyone cutting timber from public lands for commercial purposes "renders himself liable to have legal proceedings instituted against him, both civil and criminal."⁵⁸

In the spring of 1880 Martineau, acting as U. S. mineral surveyor, surveyed several mining claims in Cache County. At the same time, he served as a U.S. deputy surveyor and also spent time as a topographical engineer for the Utah and Northern Railroad in Idaho.⁵⁹ Using the 1872 survey by Ferdinand V. Hayden as a basis for his own topographical measurements, Martineau suggested that the U & NRR line should extend from Franklin through Red Rock Pass, Marsh and Portneuf valleys, and on to Soda Springs. However, when U & NRR directors decided to forfeit the proposed Soda Springs station, a line due north through the Fort Hall Indian Reservation was chosen over Martineau's recommended route.⁶⁰

Subsequent work took Martineau from Cache Valley to assist in developing settlements in Arizona and Mexico. From 1882 to 1884 he accompanied several exploring parties to Sonora to find a suitable place for Mormon colonization. From 1884 to 1886, he surveyed southern Arizona towns in the Gila Valley, including Thatcher, Curtis, Graham, Pima, Solomonville, Duncan, and Fort Thomas.⁶¹ Here he lived with his family and participated in various civil affairs. In 1888, after brief terms as probate judge of Graham County and mayor of Pima, Martineau took his family to Colonia Juarez, Mexico. From there, he spent brief periods surveying in Tucson, the Sonoran desert, and the Sierra Madre.

In 1903, after nearly seventeen years in the Mormon colonies in Mexico, Martineau moved to Salt Lake City. Though rigorous hiking must have affected his aging body, it did not deter him from surveying. Twenty-eight years earlier, on August 30, 1875, Charles L. Dubois, a deputy surveyor under contract with the surveyor general of Utah, had established the initial point of the Uintah meridian and baseline for surveys on the Uintah Indian Reservation. A series of appropriations acts had opened the way for surveys of the reservation boundaries and the creation of a baseline and meridian for use by the Utes in their own township and subdivisional surveys. Although Dubois carried out many of these Uintah surveys, other deputy surveyors, including James Martineau, completed the baseline in

⁵⁸ Nathan Kimball to James H. Martineau, October 13, 1877, 313, Nathan Kimball to J. A. Williamson, October 20, 1877, 317-18, Nathan Kimball to James H. Martineau, October 25, 1877, 319, Nathan Kimball to James H. Martineau, November 13, 1877, 325, Nathan Kimball to J. A. Williamson, December 6, 1877, 334, Letters Sent, and J. A. Williamson to Nathan Kimball, December 14, 1877, #120, Letters Received, CSGU, BLM49.

⁵⁹ Martineau, "Col. James H. Martineau," 79; *Annual Report GLO, 1881*, 905.

⁶⁰ See *Deseret Evening News*, July 10, 1875.

⁶¹ See James H. Martineau, "Settlements in Arizona," [nine-page history, c. 1885], holograph, Utah Collection, Bancroft Library, University of California at Berkeley; microfilm copy, USU Special Collections.

this remote area of northeastern Utah. The seventy-five-year-old Martineau completed the survey, beginning at the DuBois corner, running east on the baseline and terminating the line at the intersection of the eastern border of the Uintah Indian Reservation on September 14, 1903.⁶³ The rugged terrain would not have been easy for the septuagenarian to negotiate. By this time, Martineau was one of the oldest practicing civil engineers in Utah.

On September 9, 1910, the now-feeble patriarch poignantly told his son Joel of the difficult financial straits he and Susan Ellen were experiencing. He wrote,

Yesterday I had only 25¢ in the world and in debt over \$30.00 for food, etc. I felt alone, I can tell you, but your mother said, 'don't worry the Lord will provide for us.' I prayed and had testimony that I speedily would receive money. And sure enough—today Bp. [LDS Bishop] Neff of East Mill Creek sent me a letter with \$5.00. He did not owe me anything, but said he had just been reading a blessing I sealed upon him 5 or 6 years ago and it caused him tears of joy and comfort & he felt to send me a little remembrance. We were made to rejoice.... I can hardly stand alone or walk, and [it is] very difficult to pick anything up from the floor, and this last is hard for your mother too. We two live alone, doing the best we can.⁶⁴

During the Mexican revolution of 1912, Martineau's children and their families had to flee Mexico and abandon the estate that had been left in their care at the time of his return to Utah. As a result, his land and property holdings, worth thousands of dollars, were lost. Sadly, Martineau and his wife spent their final years in poverty. After Susan Ellen's death on December 5, 1918, Martineau was taken into the care of his son Lyman. He died in Salt Lake City on June 24, 1921, at the age of ninety-three. He is buried in Logan City cemetery. His two wives had mothered a total of twenty children, beginning a large and devoted posterity. In one of his final messages to his family, he wrote: "May my beloved ones profit by my labors, and become great and mighty in doing good."⁶⁴

The incredible documentary record of James Henry Martineau shows that he was an extraordinary man who diligently served his family, church, and community. In his own words, Martineau wrote that he led "a very busy life, always placing the public good before my own."⁶⁵ During his twenty-four years of residence in Logan, he surveyed large additions to the Logan City plat, tracts of farmland, hay lots, and irrigation canals. In all, he added to the surveys of some twelve communities in Cache County,

⁶³ The survey, under contract No. 265, dated July 20, 1903, began at the corner of Tps. 1 N. and 1 S., Rs. 1 and 2 E. See C. Albert White, *Initial Points*, 438.

⁶⁴ James H. Martineau, Logan, to Joel Martineau, Salt Lake City, September 9, 1910, LDS Church Archives.

⁶⁵ "Colonel James Henry Martineau," *Improvement Era* 24 (August 1921): 956; *Deseret News*, June 24 and 25, 1921. James H. Martineau, "Pearls Collected from Church Works," 1887-1917 (a daybook of quotes from LDS church authorities), 2, holograph, USU Special Collections. For more on the Mormon exodus from Mexico, see B. Carmon Hardy and Seymour Melody, "The Importation of Arms and the 1912 Mormon Exodus from Mexico," *New Mexico Historical Review* 72 (October 1997): 297-318.

⁶⁶ James H. Martineau, "Col. James H. Martineau," *Tullidge's Histories, Biographies Supplement*, 2:78.

including Providence, Millville, Hyrum, Paradise, Wellsville, Mendon, Newton, Clarkston, Richmond, Smithfield, Hyde Park, and Benson. He also surveyed or extended the initial surveys of the southeastern Idaho communities of Weston, Malad, Oxford, Franklin, Blackfoot, and Idaho Falls.

The topographic maps and public land surveys of James Henry Martineau are worthy of close examination for their wealth of information regarding the nature of town planning and geographical changes in Mormon settlements. Tied to demographic data, these maps can be helpful in charting settlement patterns, both the physical attributes of the settlements and the social mobility among Mormon landowners.⁶⁶ His county townsite surveys and federal resurveys are rich in detail, often showing individual residences, canal routes, and wagon roads. His vast cartographic legacy, in effect, serves as a representative example of settlement patterns along the Mormon geographic corridor from southeastern Idaho to northern Mexico. Although he was one of many nineteenth-century Utah surveyors, Martineau left a remarkable abundance of jurisdictional and township maps that, if utilized to their fullest extent, can provide a more complete picture of the historic Mormon landscape than has been previously visualized.

⁶⁶ See William D. Pattison, "Use of the U.S. Public Land Survey Plats and Notes as Descriptive Sources," *Professional Geographer* 8 (January 1956): 10-14; Jane F. Smith, "The Use of Federal Records in Writing Local History: A Case Study," *Prologue* 1 (Spring 1969): 29-51; "Federal Land Records," *National Genealogical Society Quarterly* 60 (December 1972): 250-55; and Richard S. Lackey, "The Genealogist's First Look at Federal Land Records," *Prologue* 9 (Spring 1977): 43-45. See also Charles S. Peterson, "Imprint of Agricultural Systems on the Utah Landscape," in *The Mormon Role in the Settlement of the West*, Charles Redd Monographs in Western History, No. 9, edited by Richard H. Jackson (Provo: Brigham Young University Press, 1978), 91-106, and John W. Reys, *The Forgotten Frontier: Urban Planning in the American West before 1890* (Columbia: University of Missouri Press, 1981), esp. 121-31.

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