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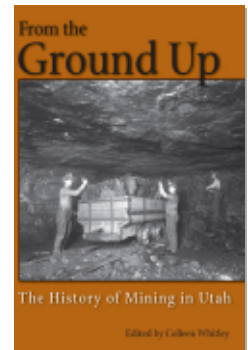
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NOTES

PREFACE

1. The two mining mascots were a fox named Copper and a bear named Coal; the third was a rabbit called Powder, honoring the snow that brings in tourist dollars.
2. For information on “An Act to Promote the Development of the Mining Resources of the United States,” see United States Land Office, *Mining Districts By-Laws, 1872–1909*, Series 3651, <http://archives.utah.gov/reference/xml/series/3651.html>.
3. For information on current mining districts and mining operations, see the Utah Mining Association’s Web site: <http://www.utahmining.org>.

I—GEOLOGY AND UTAH’S MINERAL TREASURES

William T. Parry

1. References and sources for this chapter are as follows:
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2—GENERATING WEALTH FROM THE EARTH, 1847–2000

Thomas G. Alexander

1. On the mining industry of Utah and its development, see Leonard J. Arrington, "Abundance from the Earth: The Beginnings of Commercial Mining in Utah," *Utah Historical Quarterly*: 192–219; Rossiter W. Raymond, *Statistics of Mines and Mining . . . for the Year[s] 1869 through 1871*, 4 vols.; Rodman W. Paul, *Mining Frontiers of the Far West, 1848–1880*; Rossiter W. Raymond, *Mineral Resources of the States and Territories West of the Rocky Mountains*; Rossiter W. Raymond, *Statistics of Mines and Mining in the States and Territories West of the Rocky Mountains, 1870–75 and 1877*; U.S. Geological Survey (1882–1923), succeeded by U.S. Bureau of Mines (1924–34), *Mineral Resources of the United States*, succeeded by U.S. Bureau of Mines (1933–present), *Minerals Yearbook*; Mark Wyman, "Industrial Revolution in the West: Hard-Rock Miners and the New Technology," *Western Historical Quarterly*: 39–57.
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3. On the iron-mining industry, see Gustive O. Larson, "Bulwark of the Kingdom: Utah's Iron and Steel Industry," *Utah Historical Quarterly*: 248–61.
4. Arrington, *Great Basin Kingdom*, 46.
5. Utah Economic and Business Review, *Measures of Economic Changes in Utah, 1847–1947*, 70.
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7. Arrington, *Great Basin Kingdom*, 391–92, 511 nn. 48–52.
8. *Measures of Economic Changes in Utah*, 70.
9. *Ibid.*
10. *Ibid.*, 77.
11. Alexander, "From Dearth to Deluge," 240; Edward W. Parker, "Coal Cutting Machinery," *Cassier's Magazine*: 291–93.
12. On the introduction of new technology and its benefits and hazards, see Wyman, "Industrial Revolution in the West," 39–57 and Clark C. Spence, *Mining Engineers and the American West: The Lace-Boot Brigade, 1849–1933*.
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38. For a discussion of these rules, see Wyman, "Industrial Revolution in the West," 46–47.
39. Utah Industrial Commission, *Report, 1918 to 1920*, 273.
40. *Ibid.*, 252.
41. Utah Bureau of Immigration, Labor, and Statistics, *Second Report of the State Bureau of Immigration, Labor and Statistics for the Years 1913–1914*, 220.
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87. Greg Fredde, interview with the author.
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3—GENERAL PATRICK EDWARD CONNOR, FATHER OF UTAH MINING *Brigham D. Madsen*

1. This article is taken almost entirely verbatim from Brigham D. Madsen, *Glory Hunter: A Biography of Patrick Edward Connor*. The material on Connor as a mining entrepreneur in Utah has been selected from the book with enough attention paid to his other major achievements as a military commander and political leader to give the reader an overview of his entire career. Patrick E. Connor spent most of his life developing mines in Utah Territory and well deserves the title, "The Father of Utah Mining."
2. Samuel Bowles, *Across the Continent*, 93; Anna Viola Lewis, "The Development of Mining in Utah," 40, 48.
3. Kate B. Carter, comp., *Our Pioneer Heritage*, vol. 7, 69; Leonard J. Arrington, *Great Basin Kingdom: An Economic History of the Latter-day Saints, 1830–1900*, 72–73 (reprint edition); Leonard J. Arrington, "Abundance from the Earth: The Beginnings of Commercial Mining in Utah," *Utah Historical Quarterly*: 194.
4. Of the many accounts of the Bingham discovery, Arrington's is the best: "Abundance from the Earth," 196, 199; see also John R. Murphy, *The Mineral Resources of the Territory of Utah*, 1–2; for a personal interview with Connor concerning the find, see Thomas B. H. Stenhouse, *The Rocky Mountain Saints*, 713–14; Hubert Howe Bancroft, *History of Utah: 1540–1886*, 741; William Fox, "Patrick Edward Connor: 'Father' of Utah mining," 45–48; Edward W. Tullidge, *History of Salt Lake City*, 697–98; Robert G. Raymer, "Early Mining in Utah," *Pacific Historical Review*: 81–88; Clarence King, *Statistics and Technology of the Precious Metals*, 407–8; Donald T. Schmidt, "Early Mining in Utah," 15–16.

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13. *Union Vedette*, 18 February 1864; Clayton, *Letterbooks*, reel 16; 3, 15 March 1864.
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17. *War of the Rebellion*, 887.
18. John M. Bourne, "Early Mining in Southwestern Utah and Southeastern Nevada, 1864–1873: The Meadow Valley, Pahrnagat, and Pioche Mining Rushes," 12–23. Bourne's excellent thesis describes the development of this mining area. See also *Union Vedette*, 4 May; 10 June; 11 July; 16 August 1864.
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20. Bourne, "Early Mining," 24–30.
21. *Ibid.*, 31–35; Don Ashbaugh, *Nevada's Turbulent Yesterday*, 24.
22. *War of the Rebellion*, 355–803; *Union Vedette*, 8 July 1864.
23. Bourne, "Early Mining," 37–39.
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27. Bourne, "Early Mining," 41.
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30. *Union Vedette*, 16 April 1864.
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39. *Union Vedette*, 22 October; 22 December 1864.
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49. Daniel S. Tuttle, *Missionary to the Mountain West*, 366 (1987 reprint).
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53. U.S. Congress, *A Report upon the Mineral Resources of the States and Territories West of the Rocky Mountains*, 130.
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56. U.S. Congress, *Mineral Resources of the States and Territories*, 484; see also *Journal History*, 19 February 1868.
57. *Stockton Independent*, 14 November 1868; *Mining and Scientific Press*, 28 November 1868; Rogers, *Soldiers of the Overland*, 251, 273; Brigham D. Madsen, *Corinne: The Gentile Capital of Utah*, 155.
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60. Fox, "Patrick Edward Connor," 111.
61. *Utah Reporter*, 17 May 1870. Connor's Silver King Mine was in Rush Valley and should not be confused with a mine with the same name in Park City.
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68. William Mulder and A. Russel Mortensen, eds., *Among the Mormons*, 378–79.
69. John Hanson Beadle, *The Undeveloped West*, 328; Clayton, *Letterbooks*, vol. 7, reel 15, 1 March; 27 July; 23 October 1872.
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71. Murphy, *Mineral Resources of the Territory of Utah*, 20; *Salt Lake Tribune*, 31 October 1871.
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75. *Salt Lake Review*, 31 October 1871.
76. *Corinne Reporter*, 19 April; 16 June 1871; *Salt Lake Tribune*, 18 April 1870.
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81. *Salt Lake Tribune*, 14 March; 18 April 1872; *Utah Mining Journal*, 6, 9 November 1872.
82. Aird G. Merkley, ed., *Monuments to Courage: A History of Beaver County*, 259–60.
83. The list included Flora No. 3 Ledge & Company, Flora No. 1 Ledge & Company, Merva Lode, Dora Lode, Hector Lode, Floral Tunnel Right, Connor Ledge & Co., Federal Chief Lode, Federal Chief No. 2, Federal Chief No. 3, Federal Chief No. 4, Erina Lode, Britannia Lode No. 2, and the Britannia Tunnel. The dates of filing ranged from 6 January to 17 June 1872. Beaver County Recorder's Office, North Star Mining District, Book A, 41, 42, 68, 135, 181; Book B, 11; Star Mining District, April 1871–January 1873, Book B, 215, 259, 263–65, 292, 344–45.
84. *Salt Lake Review*, 30 January 1872; *Salt Lake Tribune*, 21, 26 June 1872.
85. *Salt Lake Tribune*, 10 July 1872; *Corinne Reporter*, 8 July 1872.
86. Second Judicial District Court, Beaver County, Utah, Minute Book No. 3, 45–49.
87. Beaver County Recorder's Office, Book No. 1 of Notices, 7, 20–22,
88. *Salt Lake Tribune*, 15 June; 12 July 1872; *Utah Mining Journal*, 24 June; 8 July; 9, 27 August 1872; *Pioche Record*, 28 September 1872.
89. The chief silver mines at North Star were the Monahan, Gallagher, Keep, Shamrock, Last Discovery, Belfast, Aurora, and Montana. In the West District, Connor, Lighthall and Company were working the “valuable and extensive” Temperance and Medusa group of mines, whose ores assayed 80 dollars in silver to the ton. There were 300 tons of ore on the ground awaiting the construction of a smelter. The Flora, in the same district, and owned by Connor and Gallagher, had ores ranging in value from \$40 to \$700 to the ton in silver and 150 tons of ore on the dump awaiting processing. *Salt Lake Tribune*, 12 March 1873.
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91. *M. Livingston vs. P. Edw. Connor*, Third District Court, Salt Lake City, Utah (1873).
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4—THE STORIES THEY TELL

Carma Wadley

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J. Wallace Gwynn

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6—COAL INDUSTRY

Allan Kent Powell

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7—URANIUM BOOM

Raye C. Ringholz

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8—BERYLLIUM MINING

Debra Wagner

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9—IRON COUNTY

Janet Seegmiller

1. York Jones was a major contributor to this chapter on iron mining. Jones is a mining engineer who worked more than 40 years in the ore bodies of Iron County. His research extends through four major time periods of mining and other historical subjects. He and his wife, Evelyn Kunz Jones, have coauthored three books about the pioneers and government of Cedar City. Jones provided information for Graham D. MacDonald III's book, *The Magnet: Iron Ore in Iron County Utah*.
2. Kenneth L. Cook, *Magnetic Surveys in the Iron Springs District, Iron County, Utah*, 2; W. E. Young, *Iron Deposits in Iron County, Utah*, 1.
3. Some resource books which explain the geology of southern Utah are these: William Lee Stokes, *Geology of Utah*; Herbert E. Gregory, *Geology of Eastern Iron County, Utah*; and Halka Chronic, *Roadside Geology of Utah*.
4. MacDonald, *The Magnet*, 1–2; United States Steel Corporation, *The Making, Shaping and Treating of Steel*.
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6. William B. and Donna T. Smart, *Over the Rim: The Parley P. Pratt Exploring Expedition to Southern Utah, 1849–50*, 179.
7. "Journal of George A. Smith, President of the Iron County Mission," vol. 2 (28 April, 3 May, 6 May 1851).
8. *Deseret News*, 25 June 1852.
9. Details of the difficulties and different companies are discussed in Morris A. Shirts and Kathryn H. Shirts, *A Trial Furnace: Southern Utah's Iron Mission*.
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11. The iron ore from which iron and steel are made is an oxide, a compound of iron (Fe) and oxygen (O). Common forms—hematite (Fe_2O_3) and magnetite (Fe_3O_4)—are found in natural deposits. To produce iron, oxygen atoms are separated from iron ore by reduction, usually by causing the oxygen to react with carbon, hydrogen, or carbon monoxide, leaving the iron free as a metal. In steelmaking, the ore is smelted, producing pig iron and slag, which contain the oxidized and unreduced substances. In the 1850s an iron furnace master was like a chef with a mental file of iron recipes, and he improvised as he worked, adding a dash of one ingredient or another. The resulting pig iron varied in quality but was generally usable. In Cedar City, the British method of using coke was tried, even though it was relatively uncommon in the United States. Coke was coal reduced in covered piles or burned in closed kilns. Ironworkers also used charcoal made by burning wood in kilns, as was done in the beehive kiln at Irontown. Exhaustible forests limited the use of charcoal.

The Deseret Iron Company used a simple blast furnace, charged or filled with ore, fuel, and lime. Alternating layers of ingredients were added in measured lots when flames broke through the previous ones. Compressed air injected into the furnace by tuyeres placed on either side or in back formed the blast and made the furnace burn hotter. Air was compressed by water or steam power. Molten iron sank through the charge to the bottom of the furnace and collected in a pool. Slag drained off the top continually, but at intervals the furnace operators broke out a clay plug at the base of the hearth and drained molten iron into sand molds, forming iron “pigs” or bars, hence the term *pig iron*. Processes such as melting the pig iron in a cupola or puddling furnace further refined it and allowed it to be shaped by hammering for “wrought” or “bar” iron. Castings produced useful articles such as hand irons, cooking pots, tools, machinery parts, or wagon wheels.

12. *Deseret News*, 16 October 1852.
13. *Millennial Star*, 6 January 1855, 2.
14. The bell called the people of Cedar City together for church services, funerals, dances and plays; fires, floods, and other dangers; and all community celebrations. It is now at the Iron Mission State Park in Cedar City.
15. *Journal of Discourses*, vol. 2, 27 May 1855, 281–82.
16. When the men from Iron County reached the mines, no miners were there. The settlers had brought no picks or shovels but were not willing to return empty handed. They looked for ore to load in their wagons and located a rock slide which looked like lead ore. The deposit was far up a hillside, and they had no way to carry the ore. Undaunted, they took off their buckskin trousers, tied up the waists, filled them with ore, slung one leg over each shoulder, and carried the load down the hill. The lead was forged into bullets in readiness for the invading army. William R. Palmer, “History of Iron County,” William R. Palmer Collection, box 22, 1922.
17. Brigham Young to Isaac C. Haight, 8 October 1858, Brigham Young’s letterbook, MS f219, #8, p. 433.
18. William R. Palmer, *Forgotten Chapters of History: A Series of Talks Given over Radio Station KSUB, 1951–1955*. Transcription from audiotapes, no. 153, 1978, 1.
19. John Lee Jones, “John Lee Jones as a Missionary”; The Iron Mission Park Commission, “Building the Iron Mission Park in Cedar City, a Proposal to the Union Pacific Railroad,” 42.
20. Morris Shirts, “The Demise of the Deseret Iron Company” (address given at Mormon History Association Annual Meeting, 3 May 1986), 18.
21. ElRoy Smith Jones, *John Pidding Jones, His Ancestors and Descendants*, 10–11; Ivan Jones, “The Iron Works of the John P. Jones & Sons Company, Founded 1874, Johnson’s Springs [Enoch], Utah,” typescript in author’s possession, 1995. In 1994 a monument was dedicated by Jones’s descendants at the site of his blast furnace and foundry in Enoch.
22. This national historical site was given to the State of Utah by the Cedar City chapter of the Sons of Utah Pioneers and is maintained by the Iron Mission State Park, Utah State Parks and Recreation.

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23. John C. Cutler, who later became governor of Utah, was married to Thomas Taylor's daughter.
24. Brent D. Corcoran, "My Father's Business': Thomas Taylor and Mormon Frontier Enterprise," *Dialogue*: 111–12; Leonard J. Arrington, "Iron Manufacturing in Southern Utah in the Early 1880s: The Iron Manufacturing Company of Utah," *Bulletin of the Business Historical Society*: 3. These articles discuss the complicated business dealings among Thomas Taylor, the Mormon Church, and the iron mines, although details seem contradictory or perhaps not fully known.
25. Corcoran, "My Father's Business," 113–14.
26. *Ibid.*, 124, 131–32.
27. *Salt Lake Herald*, 6 October 1886; quoted in Arrington, "Iron Manufacture in Southern Utah in the Early 1880s," 165.
28. MacDonald, *The Magnet*, 13–15. The Utah Iron Ore and Steel Corporation also built a small steel plant in Midvale, Utah, in 1915. Since it survived on government contracts during World War I, the plant closed when the war and the contracts ended.
29. Quoted in MacDonald, *The Magnet*, 16.
30. *Iron County Record*, 20 June 1946.
31. MacDonald, *The Magnet*, 31–32.
32. *Iron County Record*, 5 October, 17 November 1949; 5, 26 June 1952; 31 July 1952; 7 August 1952; 5 July 1956; 10 July, 12 November 1959. Also *Encyclopedia International*, 1966, 17: 263–64; MacDonald, *The Magnet*, 42.
33. *Iron County Record*, 17 May 1951.
34. York F. Jones, "History of Mining in Iron County," unpublished manuscript, Chapter V, "Iron Mountain Mining, 1935–1970," table titled "Iron Ore Production, 1923–1968."
35. MacDonald, *The Magnet*, 47.
36. When the Blowout pit closed in 1968 at a depth of 625 feet, 7,168,047 tons of hard magnetite ore had been mined with an average iron content of 60 percent iron (Fe).
37. York F. Jones, BHP-Utah International operations manager, interview with the author, June 1994.
38. LaMar G. Jensen, Iron County Treasurer, to York Jones of Utah International, Inc., 23 December 1975, copy in York F. Jones, "History of Mining in Iron County," Chapter V.
39. "Historical Information for Iron County Mines" (report prepared by Roy Benson, manager of mining, Geneva Steel, for this history, 6 January 1995; tax information from Merna H. Mitchell).
40. "Geneva Steel Has Six Weeks to Find a Buyer or Financing," *Salt Lake Tribune*, 16 March 2002; "Geneva Steel Fails to Beat the Bankruptcy Deadline," *Salt Lake Tribune*, 17 November 2002; "Geneva Facing Bleak Future," *Daily Universe*, 24 October 2002; "Geneva Steel LLC," *AISE Steel News*, 29 March 2003; Dave Anderton, "Sale Ok'd of Geneva Property," *Deseret Morning News*, 29 July 2004, E-1.
41. Keera Ward, "Mine to open near city," *University Journal*, 3 October 2005, 3. Also available at <http://www.palladonmining.com>. Meg Cady, "Palladon Ready for Iron," *The Spectrum* 29 May 2006, 1.
42. Grant Tucker, formerly of Cedar City, contributed to this section, with additional information provided by Clemont Adams. Grant Tucker, "Notes on Iron County Coal Mining," in author's possession, 29 August 1994; Gregory, *Geology of Eastern Utah*, 145–50.
43. Henry Lunt, "Journal," 13 August–2 September 1852. York Jones and Morris Shirts located these early mining sites while researching the Iron Mission and Henry Lunt (per a conversation with York Jones, 7 September 1994).
44. Tucker, "Notes on Iron County Coal Mining," 1.
45. Paul Averitt, *Geology and Coal Resources of the Cedar Mountain Quadrangle, Iron County Utah*, 54.
46. *Ibid.*, 60.
47. William C. Adams, "History of Coal Mining in and around Cedar City," interview by Clemont B. Adams, 7 July 1965, typescript in author's possession.

NOTES

48. *Iron County Record*, 28 November 1913, 1.
49. This may have been the same two-story cabin used by Francis Webster, Henry Lunt, and Christopher Arthur as a hideout during the polygamy raids in 1887. It must have been renovated if it was the same structure. Pictures of the Corry Hotel/boardinghouse at the Iron County Coal Company mine taken in 1918 show a large frame structure with glass-paned windows.
50. L. W. Macfarlane, *Dr. Mac: The Man, His Land, and His People*, 223–24 (2d edition); *Salt Lake Herald Republican*, 13 November 1916, 10; *Iron County Record*, 18 November 1913; 8, 22 February; 12 April; 26 July; 15 November 1918.
51. William C. Adams interview, 7.
52. The height of the face of the coal mine is stated as 11 feet in the *Iron County Record*, 22 July 1937, and 15 feet in the *Iron County Record*, 14 October 1937. Grant Tucker, son of Guy C. Tucker, says the face was opened up to 15 feet, with two clay seams in the coal seam, one about 18 inches from the roof, and the other about 24 inches from the floor. Tucker, “Notes on Iron County Coal Mining,” 1; “Dr. A. L. Graff Locates Long Lost Coal Mine Of High Coking Qualities,” *Iron County Record*, 22 July 1937, 1. Averitt in *Geology and Coal Resources of the Cedar Mountain Quadrangle*, 59, places the coke ovens near the Old Kanarraville Mine. However, the ovens are adjacent to the Graff Kleen Koal Mine, which dates the opening of the mine at this site to the 1880s.
53. Gregory, *Geology of Eastern Iron County, Utah*, 145–48.
54. Tucker, “Notes on Iron County Coal Mining,” 1–2.
55. *Ibid.*, 2.
56. “Air Cleaning, Diesel Haulage Move Koal Kreek Ahead,” *Coal Age*: 72–75.
57. Averitt, *Geology and Coal Resources of the Cedar Mountain Quadrangle*, 60–61.
58. Edward H. Hahne is the major contributor to the section on silver mining. He was general manager at the Escalante Silver Mine.
59. Placer means there were nuggets large enough to be found through panning or washing for gold in streams or, more likely, in washes that were wet in the spring.
60. “Sheriff’s Sale,” *Iron County Record*, 10 September 1904.
61. *Gold Guidebook for Nevada and Utah*, 104.
62. *Stateline Oracle*, 28 November 1903 (microfilm available at Sherratt Library); *Iron County Record*, 9, 30 January 1903; 13 February 1904.
63. *Iron County Record*, 3 March 1905.
64. *Iron County Record*, 30 April 1909; 17 February 1911.
65. The name Deer Lodge, from Deerlodge Canyon in eastern Lincoln County, Nevada, is also associated with this district.
66. *Gold Guidebook*, 57.
67. *Iron County Record*, 11 January 1918.
68. *Gold Guidebook*, 57; also information given to the author by Dr. Blair Maxfield, 8 September 1995.
69. Joseph Fish, “History of Enterprise,” typescript, 131.
70. E. H. Hahne, “History of the Mine as I Remember It,” typescript, c. 1996, copy in the author’s possession.
71. E. H. Hahne, “History of the Mine”; Bruce Lee, “After 2 Years, \$30 Million, Mine Producing Silver,” *Salt Lake Tribune*, 11 January 1982, B-8.
72. E. H. Hahne to State of Utah Natural Resources, 21 February 1986, copy in author’s possession.
73. Hecla Mining Company Annual Report, 1987.
74. *Iron County Record*, 18, 25 December 1929; 18 January 1930.
75. *Iron County Record*, 10 July 1903, 4; 30 January 1904, 1; 2 April 1904, 1. Further mining was done during World War I. *Iron County Record*, 25 October 1918.
76. *Iron County Record*, 11 Mar 1910.

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77. Iron County Record, 24 October 1918.
78. Macfarlane, *Dr. Mac*, 204–6; Elroy Nelson, *Utah's Economic Patterns*, 182.
79. Averitt, *Geology and Coal Resources of the Cedar Mountain Quadrangle*, 64–65.

10—BINGHAM CANYON

Bruce D. Whitehead and Robert E. Rampton

1. Leonard J. Arrington and Gary B. Hansen, *The Richest Hole on Earth: A History of the Bingham Copper Mine*, 11.
2. The following story, including quotations, comes from W. W. Gardner, interview with Heber J. Hart, in *Kennoscope* (a company magazine of Kennecott's Utah Copper Division, November 1974), 2; Kennecott Copper Corporation Archives.
3. Connor was still a colonel and commander at Fort Douglas in 1863. He was appointed major general of the Utah militia in 1870. T. A. Rickard, *The Utah Copper Enterprise*, 15. See also chapter three of this volume and Brigham D. Madsen, *Glory Hunter: A Biography of Patrick Edward Connor*.
4. Those present were Archibald Gardner; George B. and Alex Ogilvie; Hugh O'Donneel; M. C. Lewis; Dr. Robert K. Reid, surgeon at Fort Douglas; Col. Charles Jeffrey Sprague, paymaster at Fort Douglas; Samuel Egbert, farmer and stockman in West Jordan; Neil Anderson, Swedish immigrant working in Bingham Canyon; Patrick Edward Connor; Richard Colter Drum; along with William A. Hickman, General Edward McGarry, Captain Daniel McLean, and Colonel Robert Pollock, officers at Fort Douglas; H. O. Pratt, telegraph operator; John Hardcastle; Alex, Henry, and Thomas Bexsted; James Briniger; James Finnerty; G. W. Carleton; M. J. Jenkins; H. O Pratt; Robert Pollack; David McLean; and H. B. Eldred. Gardner, interview with Hart, 3; Lynne R. Bailey, *Old Reliable*, 17.
5. The name West Mountain was selected as the English translation of the Indian word *Oquirrh*.
6. Arrington and Hansen, *Richest Hole on Earth*, 12.
7. Rickard, *Utah Copper Enterprise*, 16.
8. Beatrice Spendlove, "History of Bingham Canyon, Utah," 8.
9. *Ibid.*
10. Bailey, *Old Reliable*, 69–70.
11. *Ibid.*, 51.
12. Arrington and Hansen, *Richest Hole on Earth*, 11–12.
13. T. A. Rickard, *A History of American Mining*, 191. Colonel Wall's military title was given to him by his friends.
14. Rickard, *Utah Copper Enterprise*, 17.
15. A. B. Parsons, *The Porphyry Coppers*, 50.
16. Spendlove, "History of Bingham Canyon," 13.
17. *Engineering and Mining Journal*, (9 July 1898), 67.
18. Arrington and Hansen, *Richest Hole on Earth*, 18.
19. Untitled manuscript, Kennecott Copper Corporation Archives, c. 1957.
20. *Salt Lake Tribune*, 1 January 1899.
21. *Deseret News*, 8 February 1905. A discussion of emissions and farming appears in Michael A. Church, "Smoke Farming: Smelting and Agricultural Reform in Utah, 1900–1945," *Utah Historical Quarterly*: 196–218.
22. *Deseret News*, 5, 14, 15 November 1906.
23. Spendlove, "History of Bingham Canyon," 25.
24. Jackling earned the rank of colonel by his service to Colorado Governor J. H. Peabody with the Colorado National Guard from 1903 to 1904 and service to Utah Governor William Spry with the Utah National Guard from 1909 to 1913. Consequently, he is frequently called Colonel Jackling.

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25. Bailey, *Old Reliable*, 42.
26. Ibid.
27. Untitled manuscript, Kennecott Copper Corporation Archives, c. 1957.
28. Ibid.
29. Arrington and Hansen, *Richest Hole on Earth*, 37.
30. Ibid.; italics in original.
31. Ibid.
32. Parsons, *Porphyry Coppers*, 68–69.
33. Ibid.
34. Bailey, *Old Reliable*, 53.
35. Arrington and Hansen, *Richest Hole on Earth*, 52.
36. Bailey, *Old Reliable*, 32, 46.
37. David B. Morris, “Digging Out: Kennecott Resurfaces in an Era of Global Competition” manuscript, 1993, 13, Kennecott Copper Corporation Archives.
38. Parsons, *Porphyry Coppers*, 79.
39. Arrington and Hansen, *Richest Hole on Earth*, 64.
40. Ibid., 64–67; Parsons, *Porphyry Coppers*, 50.
41. Bailey, *Old Reliable*, 63.
42. Helen Z. Papanikolas, “Life and Labor among the Immigrants of Bingham Canyon,” *Utah Historical Quarterly*: 290.
43. Ibid., 292.
44. Bailey, *Old Reliable*, 98.
45. “The People Who Made Kennecott,” *Deseret News*, 27 March 1985, C1. The IWW was reputed to have socialist, anarchist, or communist ties and was seen as among the most violent of the emerging labor organizations.
46. A *padrone*, literally “master” or “boss” in Italian, was a contractor who provided laborers for a business or industry, usually, as in the case of Skliris, for a fee paid by each worker.
47. Papanikolas, “Life and Labor among the Immigrants,” 295.
48. Ibid., 296.
49. Ibid.
50. Ibid., 307; “The People Who Made Kennecott,” C1.
51. Bailey, *Old Reliable*, 103.
52. Ibid.
53. Ibid., 104.
54. Papanikolas, “Life and Labor among the Immigrants,” 298.
55. *Salt Lake Tribune*, 19 September 1912, quoted in Papanikolas, “Life and Labor among the Immigrants,” 300–301.
56. Ibid.
57. Bailey, *Old Reliable*, 107–8.
58. Ibid., 103.
59. Papanikolas, “Life and Labor among the Immigrants,” 302–3.
60. Bailey, *Old Reliable*, 103.
61. “Outline of History of Bingham Canyon and Kennecott Utah Copper,” 2, Kennecott Copper Corporation Archives.
62. Draft of script for Kennecott informational video, 26 August 2003, in possession of W. S. Adamson and Associates, Inc.
63. Spendlove, “History of Bingham Canyon,” 64.
64. Harvey O’Connor, *The Guggenheims: The Making of an American Dynasty*, 352.
65. Arrington and Hansen, *Richest Hole on Earth*, 68.

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66. Ibid.
67. Telluride Power Company document, Kennecott Copper Corporation Archives.
68. Bailey, *Old Reliable*, 83.
69. Ibid., 172.
70. Ibid., 154–57.
71. Spendlove, “History of Bingham Canyon,” 153–54.
72. Ibid., 154–55.
73. Ibid., 149–53.
74. Helen Z. Papanikolas, “Georgia Lathouris Mageras: Magerou, the Greek Midwife,” *Utah Historical Quarterly*: (Fall 1965); reprinted in Colleen Whitley, ed., *Worth Their Salt, Too: More Notable but Often Unnoted Women of Utah*, 159–70.
75. Alta Miller, “A Short Sketch of My Life,” in *Worth Their Salt, Too*, 145–46.
76. Floralee Millsaps, “Ada Duhigg: Angel of Bingham Canyon,” in *Worth Their Salt, Too*, 156.
77. Ibid., 159.
78. Parsons, *Porphyry Coppers*, 80, quoted in Arrington and Hansen, *Richest Hole on Earth*, 70.
79. Arrington and Hansen, *Richest Hole on Earth*, 70.
80. “World’s Biggest Artificial Hole,” *Literary Digest*, 17.
81. Utah Copper Company, “Annual Report,” 1933, 7.
82. Kennecott Copper Corporation, “Annual Report,” 1934, 5.
83. Kennecott Copper Corporation, “Annual Report,” 1935, 6.
84. Bailey, *Old Reliable*, 164.
85. Kennecott Copper Corporation, “Annual Report,” 1936, 5.
86. Ibid., 14.
87. Kennecott Copper Corporation, “Annual Report,” 1942, 6.
88. Kennecott Copper Corporation, “Annual Report,” 1947, 5.
89. Arrington and Hansen, *Richest Hole on Earth*, 77.
90. Ibid.
91. Bailey, *Old Reliable*, 172.
92. Rosie the Riveter was a popular icon of women working in men’s jobs. She appeared on posters, in newspapers, and eventually on T-shirts.
93. Morris, “Digging Out,” 21.
94. Kennecott Copper Corporation, “Annual Report,” 1945, 2.
95. Jackling received still other honors. On 19 April 1955, Brigadier General Maxwell E. Rich, the Utah adjutant general, by Special Order promoted Colonel Jackling to the honorary rank of brigadier general in the Utah National Guard: “In recognition of outstanding and meritorious service rendered the Utah National Guard, the State of Utah, and the United States of America during a long and distinguished career which has included two World Wars, and in appreciation of technological and managerial contributions of important significance to the State of Utah.” State of Utah, Military Department, Office of the Adjutant General, Special Orders 11, 19 April 1955.
96. “Daniel Jackling, Engineer, Is Dead,” *New York Times*, 15 March 1956.
97. Morris, “Digging Out,” 20.
98. J. P. O’Keefe, general manager, Utah Copper Division, in *Kennescope* (March–April 1963), 2, Kennecott Copper Corporation Archives.
99. Ibid., 4–5.
100. Bailey, *Old Reliable*, 176–79.
101. Morris, “Digging Out,” 22–23.
102. Ibid., 34.
103. Ibid.
104. Louis J. Cononelos and Philip F. Notarianni, “Kennecott Corporation,” 2, Kennecott Copper Corporation Internal Archives.

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105. Ibid.
106. Draft of script for Kennecott informational video "A Story about Kennecott Utah Copper," 26 August 2003; data in Kennecott files.
107. Kennecott Utah Copper Charitable Foundation, "Annual Report," 2003. An interesting addition to the Visitors Center occurred in 2004, when the Theater Candy Company donated a panorama of four separate photographs taken in 1950 by Hal Romel. Originally in black and white, the pictures were hand tinted and on display originally in a theater lobby.

11 — SILVER REEF AND SOUTHWESTERN UTAH'S SHIFTING FRONTIER W. Paul Reeve

1. *Salt Lake Tribune*, "Southern Utah" 18 August, "Southern Utah" 19 December 1875; "Bonanza City" 13 February, "Bonanza City" 5 April 1876. For other reports from the region during the same time period, see *ibid.*, "Bonanza City" 24 March, "Harrisburg Disaster" 25 March; "Harrisburg Disaster" 1 April, "Southern Utah" 2 May 1876.
2. *Pioche Daily Record* (Pioche, Nevada), 17 April 1873. For a more detailed account of these events and a broader context for mining activity in southwestern Utah and southeastern Nevada, see W. Paul Reeve, "Mormons, Miners, and Southern Paiutes: Making Space on the Nineteenth-Century Western Frontier," chapters 1–3.
3. Irving Telling, "History of William Haynes Hamblin," in Irving Telling, *A Preliminary Study of the History of Ramah, New Mexico*.
4. The version of the initial discovery here is gleaned from a report written by Captain Hempstead and published in the "Editorial Notes—Discovery, Location etc., of the Panacka Lead," *Daily Union Vedette* (Salt Lake City), 2 July 1864. Hempstead was at the claims in 1864 and likely learned the information in his report firsthand. In any case his is the most detailed and a chronologically close retelling of the first location by Hamblin with Moroni as guide. There is, however, another version of the discovery in a letter from Edward Bunker, LDS bishop at Santa Clara, to Brigham Young (20 January 1864, Brigham Young Collection, office files, 1832–78, microfilm, reel 40, box 29, folder 17). According to Bunker, the Paiutes had been trying to persuade Hamblin "to go with them to a lead mine as they said the Mormons wanted lead. Last fall he [Hamblin] consented to go with them. He found the mine situated about 12 miles from Meadow Valley lying about northwest from here and about 120 miles distant. He brought [sic] some of the ore home with him." Bunker also mentions Hamblin giving a gun to a Paiute, not as inducement to show him the place but as incentive to keep the spot secret, especially from a group of California prospectors then searching for wealth in the area.

It is difficult to know which version is more accurate. I have relied upon Hempstead's account because it seems more plausible that Hamblin would be twisting Moroni's arm to show him the ore, rather than the other way around. Given Hamblin's two-year search for gold in California, it is difficult to imagine him resisting Indian enticements to find wealth nearby. Bunker's telling is perhaps tailored to Brigham Young as audience because it makes Hamblin a reluctant participant instead of an active prospector, much more in line with Young's general policy against mining. See also the testimony of William Pulsipher in the *Raymond and Ely vs. Hermes* mining case and Judge Pitzer's closing argument as a lawyer for the Hermes Company in that case, *Pioche Daily Record*, 29 March; 12, 24 April 1873.

5. The Bunker group consisted of William Pulsipher, William Hamblin, Alsen Hamblin, Daniel C. Cill, Andrew Gibbons, Benjamin Brown Crow, Jeremiah Leavitt, A. Chamberlain, and the county surveyor, Israel Ivins. See Daniel Bonelli to George A. Smith, 30 April 1864, Brigham Young Collection, office files, 1832–78, microfilm, reel 40, box 29, folder 17; Bunker to Young, 20 January 1864; John M. Bourne, "Early Mining in Southwestern Utah and Southeastern Nevada, 1864–1873: The Meadow Valley, Pahranaagat, and Pioche Mining Rushes," 22–23.

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6. Brigham Young to Edward Bunker, 6 February 1864, Brigham Young Collection, outgoing correspondence, book 7, p. 194.
7. Ibid.
8. For more on Connor, see Brigham D. Madsen, *Glory Hunter: A Biography of Patrick Edward Connor* and chapter three of this volume.
9. See Reeve, "Mormons, Miners, and Southern Paiutes," 30–54, for a more detailed account of these events.
10. Bonelli to Smith, 30 April 1864; Panaca Ward, Uvada Stake, manuscript history and historical reports, microfilm, LR 6708, series 2.
11. P. Edw. Connor, Brigadier-General, Commanding, to Captain David J. Berry, 30 April 1864, in U.S. War Department, *The War of the Rebellion: A Compilation of the Official Records of the Union and Confederate Armies*, series 1, vol. 50, pt. 2, 845; Micajah G. Lewis to Captain David J. Berry, 13 May 1864, in U.S. War Department, *War of the Rebellion*, 845.
12. Reeve, "Mormons, Miners, and Southern Paiutes," 41.
13. *Daily Union Vedette*, 8 July 1864.
14. Erastus Snow to Brigham Young, 19 June 1864, Brigham Young Collection, office files, 1832–78, microfilm, reel 55, box 42, folder 18.
15. "Our Notes Continued—Snowstorms and Birch Stakes—The Mines," *Daily Union Vedette*, 1 July 1864. Italics in original.
16. "Our Southern Notes Resumed—The St. George Party and its Cache," *Daily Union Vedette*, 8 July 1864, "The Meadow Valley Mines," *Daily Union Vedette*, 11 July 1864.
17. *Pioche Daily Record*, "The Great Mining Suit," 28, 30 March; 1 April 1873; Panaca Ward manuscript history.
18. *Pioche Daily Record*, 28, 29 March 1873.
19. *Annual Report of the State Mineralogist of the State of Nevada for 1866*, 64; *Daily Union Vedette*, 31 January 1866; Church of Jesus Christ of Latter-day Saints, *Journal History*, 6 July 1866; Bourne, "Early Mining," 55–56.
20. *Annual Report of the State Mineralogist*, 64; *American Journal of Mining, Milling, Oil-Boring, Geology, Mineralogy, Metallurgy, etc.* 1 (12 May 1866): 100; *Journal History*, 6 July 1866, 2–3.
21. *Daily Union Vedette*, 18 November 1865. Sale resigned his post as recorder in October 1865. *Annual Report of the State Mineralogist* notes that the number of mining locations on record for Pahranagat "probably reaches one thousand" (64).
22. Thomas C. W. Sale to O. H. Irish, 4 May 1865, Letters Received by the Office of Indian Affairs, Utah Superintendency, 1863–65, microfilm roll #901; James W. Hulse, *The Silver State: Nevada's Heritage Reinterpreted*, 53 (2d edition).
23. *The Mining and Scientific Press* 13 (21 July 1866): 38–39; 13 (8 September 1866): 151; *American Journal of Mining*: 100.
24. *Daily Union Vedette*, "From South Utah, Silver Regions," 1 November 1865; "The Pahranagat Silver District," 31 January 1866.
25. *Daily Union Vedette*, "Mr. Editor," 30 May 1866.
26. James W. Hulse, "Boom and Bust Government in Lincoln County, Nevada, 1866–1909," *Nevada Historical Society Quarterly*: 78–79 n. 5.
27. The house debate over the bill is contained in *Congressional Globe*, part 3, 2368–70. To trace the bill (Senate Bill 155) through the Senate and House, see *Congressional Globe*, part 1, 645; part 2, 1386, 1401, 1535; part 3, 2358, 2377, 2381. The bill also added a portion of northwestern Arizona Territory to Nevada, which was ratified by the Nevada Legislature in 1867. See Donald Bufkin, "The Lost County of Pah-Ute," *Arizoniana: The Journal of Arizona History*: 7; and John M. Townley, *Conquered Provinces: Nevada Moves Southeast, 1864–1871*.
28. Rossiter W. Raymond, *Statistics of Mines and Mining in the States and Territories West of the Rocky Mountains* (first annual report of U.S. Commissioner of Mining Statistics), 1868, pp. 114–15.

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29. Mel Gorman, "Chronicle of a Silver Mine: The Meadow Valley Mining Company of Pioche," *Nevada Historical Society Quarterly*: 71; *The Raymond and Ely vs. The Kentucky Mining Co. Judge Beatty's Decision*, 4.
30. Reeve, "Mormons, Miners, and Southern Paitues," 44–46.
31. *Journal History*, 25 November 1872, 1.
32. Orson Welcome Huntsman, "Diary of Orson W. Huntsman," typescript, 53–54, 74, 81, 82, 94, 96, 110, 111.
33. Paul Dean Proctor and Morris A Shirts, *Silver, Sinners and Saints: A History of Old Silver Reef, Utah*, 47–49.
34. Mark A. Pendleton, "Memories of Silver Reef," *Utah Historical Quarterly*: 99–118; Proctor and Shirts, *Silver, Sinners and Saints*, 26. See also chapter four of this book for the full story.
35. Pendleton, "Memories of Silver Reef," 99–118; Proctor and Shirts, *Silver, Sinners and Saints*, 26.
36. *Silver Reef Miner*, 29 October 1878, quoted in Alfred Bleak Stucki, "A Historical Study of Silver Reef: Southern Utah Mining Town," 12.
37. Stucki, "Historical Study of Silver Reef," 13; Proctor and Shirts, *Silver, Sinners and Saints*, 29.
38. "Southern Utah," *Salt Lake Tribune*, 2 May 1876.
39. James G. Bleak, "Annals of the Southern Utah Mission," typescript, special collections, B:173–75, 179–82; see also B:183–97; 419–23.
40. *Journal History*, 5 June 1870, 6.
41. Stucki, "Historical Study of Silver Reef," 13–18; Proctor and Shirts, *Silver, Sinners and Saints*, 27–34.
42. Stucki, "Historical Study of Silver Reef," 18; Proctor and Shirts, *Silver, Sinners and Saints*, 35–36; Ferris recounted his involvement at Silver Reef in a letter to the editor of *Mines and Methods*, April 1920. The quote here is from that letter, as reprinted in Proctor and Shirts, *Silver, Sinners and Saints*, 35–36.
43. Stucki, "Historical Study of Silver Reef," 18; Proctor and Shirts, *Silver, Sinners and Saints*, 37.
44. Brian F. Hahn, "Walker Brothers," in *Utah History Encyclopedia*, ed. Allan Kent Powell, 616–17.
45. Proctor and Shirts, *Silver, Sinners and Saints*, 37–38; Stucki, "Historical Study of Silver Reef," 18–19.
46. Stucki, "Historical Study of Silver Reef," 18–20; Proctor and Shirts, *Silver, Sinners and Saints*, 37–38.
47. *Salt Lake Tribune*, 19 December 1875; Stucki, "Historical Study of Silver Reef," 20–21; Proctor and Shirts, *Silver, Sinners and Saints*, 38–41.
48. *Salt Lake Tribune*, 1 April 1876; Proctor and Shirts, *Silver, Sinners and Saints*, 39.
49. Stucki, "Historical Study of Silver Reef," 21–22.
50. *Salt Lake Tribune*, 25 March 1876, quoted in Stucki, "Historical Study of Silver Reef," 24.
51. "Bonanza City," *Salt Lake Tribune*, 5 April 1876.
52. Stucki, "Historical Study of Silver Reef," 25; Proctor and Shirts, *Silver, Sinners and Saints*, 41–43.
53. Reeve, "Mormon, Miners, and Southern Paiutes," 208.
54. For reports of merchants and miners moving from Pioche to Silver Reef, see the *Pioche Weekly Record*, 19 May 1877; 6 April 1878; Proctor and Shirts, *Silver, Sinners and Saints*, 47–49; Stucki, "Historical Study of Silver Reef," 31–39.
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86. "Letter from Silver Reef," *Salt Lake Tribune*, 9 February 1881.
87. Ibid. See also the following articles from the *Salt Lake Tribune*: "The Silver Reef Trouble" and "Silver Reef," 4 February 1881; "Silver Reef Matters," 9 February 1881; "Silver Reef Strike," 8 February 1881; "The Silver Reef Row," 10 March 1881; and "Silver Reef Affairs," 19 March 1881.
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12 — ALTA, THE COTTONWOODS, AND AMERICAN FORK

Laurence P. James and James E. Fell, Jr.

1. This work began when Laurence P. James interviewed many old mining people about their work in the Cottonwood-American Fork area. Their gift of time to answer innumerable questions about the Wasatch region was priceless. So, too, was the opportunity to work with Charles Keller of Salt Lake City, Utah, and Richard Winslow of the Public Library in Portsmouth, New Hampshire; their help is especially appreciated. Both authors wish to thank the many enthusiastic historians and chroniclers who have provided their time and data. Finally, both authors wish to thank Corwin Grueble of the University of Colorado, Denver, for his computer expertise.
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13—PARK CITY

Hal Compton and David Hampshire

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30. Stephen L. Carr and Robert W. Edwards, *Utah Ghost Rails*, 104–6.
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66. *Salt Lake Mining Review*, 15 January 1923, p. 39.
67. *Salt Lake Mining Review*, 30 December 1923, p. 17.
68. *Salt Lake Mining Review*, 30 January, 15 March 1927.
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70. *Park Record*, 31 January, 4 April 1930.
71. *Park Record*, 20 February 1931, 1 May 1931, 19 February 1932.
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73. James Ivers, interview with David Hampshire, 13 September 1997, transcript in possession of the author. Ivers held several positions at the Silver King during the 1930s and 1940s, including chief engineer. He moved to northern Michigan in 1950 but returned to Park City in January 1965 as president of United Park City Mines. Ivers was the third generation of a Park City family to play an important role in the Silver King. His grandfather, also named James Ivers, had been a partner of Keith and Kearns in the Silver King. His father, with the same name, was the general manager of the Silver King Coalition from 1935 to 1952 and president from 1952 to 1953.
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78. *Park Record*, 12 July 1935, p. 1.
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82. *Deseret News*, 3, 9, 11 December 1936.
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88. *Park Record*, 6 June, p. 1, 12 December 1940; 14 August 1941.
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91. *Park Record*, 29 April, 24 June 24, 22 July 1948; 28 April 1949.
92. *Salt Lake Tribune*, 22, 30 June 1949, p. 19.
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14—TINTIC MINING DISTRICT

Philip F. Notarianni

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2. *Eureka Reporter*, 15 February 1918, 1.
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16. *Salt Lake Tribune*, 1 January 1892, 24; Heikes, “History of Mining and Metallurgy,” 106. For the agreement between the Tintic Range Railway and the D&RGW, see “Important Contracts,” Denver + Rio Grande Railroad, Davis Yard, Salt Lake City, Utah, 1903. Copy in author’s possession.
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22. *Western Mining Gazetteer*, 8 January 1881, 2.
23. Pearl D. Wilson, June McNulty, and David Hampshire, *A History of Juab County*, 101.

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29. *Salt Lake Tribune*, 1 January 1891, 2.
30. *Salt Lake Tribune*, 1 January 1892, 24.
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48. *Tintic Miner* (Eureka, Utah), 1 November 1895 (unpaginated).
49. Richard E. Lingenfelter, *The Hardrock Miners: A History of the Mining Labor Movement in the American West, 1863–1893*, 216.
50. In 1886 the miners had formed a local union and affiliated with the Knights of Labor. See Johnathan Ezra Garlock, "A Structural Analysis of the Knights of Labor: A Prolegomenon to the History of the Producing Classes," 411.
51. *Salt Lake Tribune*, 22 February 1893, 5.
52. *Salt Lake Tribune*, 7 March 1893, 5; 8 March 1893, 7.
53. *Salt Lake Tribune*, 28 February 1893, 7; Lingenfelter, *Hardrock Miners*, 217.
54. *Salt Lake Tribune*, 8 March 1893, 7.

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55. *Salt Lake Tribune*, 11 March 1893, 5; 8 March 1893, 5.
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58. Allan Kent Powell, "Mormon Influence on the Unionization of Eastern Utah Coal Miners, 1903–33," *Journal of Mormon History*, 92.
59. *Salt Lake Tribune*, 20 March 1893, 6.
60. *Salt Lake Tribune*, 28 March 1893, 5.
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62. *Deseret News*, 29 April 1893, 4.
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64. *Deseret News*, 15 March 1893, 3; *Salt Lake Tribune*, 17 March 1893, 5; 1 April 1893, 5; 2 April 1893, 5; 3 April 1893, 5; and 6 June 1893, 8.
65. *Salt Lake Tribune*, 11 June 1893, 3; 14 June 1893, 3; and 30 June 1893, 8.
66. *Salt Lake Tribune*, 7 April 1893, 7.
67. In the *Salt Lake Tribune*, 14 June 1893, 3, Eureka union men charged that the Beck people had blown up the houses and blamed the union to create a public outcry. The outcry did not materialize.
68. *Salt Lake Tribune*, 1 January 1895, 26.
69. Melvin Dubofsky, "The Origins of Western Working Class Radicalism, 1890–1905," *Labor History*: 136–37.
70. For more information on labor relations in the mining industry generally, see Vernon H. Jensen, *Heritage of Conflict: Labor Relations in the Non-ferrous Metals Industry Up to 1930*.
71. *Salt Lake Tribune*, 1 January 1895, 26–27; Heikes, "History of Mining and Metallurgy," 116; Harris, *Towns of Tintic*, 134.
72. *Salt Lake Mining Review*, 15 July 1899, 5.
73. *Salt Lake Tribune*, 1 January 1899, 17.
74. *Salt Lake Tribune*, 1 January 1895, 26–27.
75. *Salt Lake Tribune*, 1 January 1896, 21; 1 January 1897, 20; 1 January 1898, 17.
76. *Salt Lake Mining Review*, 15 September 1899, 5.
77. Heikes, "History of Mining and Metallurgy," 108; Don Maguire, *Utah's Great Mining Districts*, 121.
78. Maguire, *Utah's Great Mining Districts*, 22.
79. Harris, *Towns of Tintic*, 119; McCune, *History of Juab County*, 201–3.
80. Eureka City Minute Book, Book I, 1; Eureka City Criminal Justice Docket Ledger, 1893. In one incident, the mayor, Hugo Deprezin, was arrested in a house of prostitution and, when questioned about his presence there, remarked that he had been to the dentist and received a shot of Novocain, and hence had no knowledge of his actions.
81. *Salt Lake Tribune*, 1 January 1898, 17; *Eureka Reporter*, 25 July 1929, 1.
82. *Eureka Reporter*, 5 December 1902, 8; 14 May 1909, 12; 6 March 1903, 1; 20 November 1903, 8; 20 March 1903, 8.
83. *Eureka Reporter*, 13 March 1903, 1, 8; 13 November 1903, 8; 19 February 1904, 5; 16 January 1903, 8.
84. *Eureka Reporter*, 4 June 1909, 3; 23 July 1909, 1.
85. Heikes, "History of Mining and Metallurgy," 106–8.
86. Chief Consolidated Mining Company Meeting Minutes, vol. 1, 16 February 1909–December 1922; *Salt Lake Mining Review*, 15 March 1909, 30; *Eureka Reporter*, 19 March 1909, 8; 30 July 1909, 1; 28 January 1910, 1; Abstracts of Title, Eureka, Utah, Juab County.
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88. See the production table in Federal Emergency Relief Administration, *The Significance to the Rural Relief Problem of Economic Fluctuations in the Tintic Metal Mining Region in Utah*, 50.
89. Raymond D. Steele, *Goshen Valley History*, 208–11.

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90. *Eureka Reporter*, 18 September 1914, 1.
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93. Federal Emergency Relief Administration, *Rural Relief Problem*, 50.
94. *Eureka Reporter*, 20 November 1925, 1; 8 October 1926, 1; 17 February 1928, 7. See "Annual Report of the RGW Railway Company to the Stockholders for the Year Ending June 30, 1892," p. 28, box 43.
95. Federal Emergency Relief Administration, *Rural Relief Problem*, 189–94.
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97. Wilson, McNulty, and Hampshire, *History of Juab County*, 224.
98. *Eureka Reporter*, 6 June 1941, quoted in Wilson, McNulty, and Hampshire, *History of Juab County*, 228.
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15—SAN FRANCISCO MINING DISTRICT

Martha S. Bradley

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2. U.S. Congress, *Statutes at Large, Treaties, and Proclamations, of the United States of America*, 1872, vol. 17, chapter 152.
3. For more on Brigham Young's recommendations about mining and the earliest mining explorations in the state, see chapter three of this volume
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5. Joe Smith, interview with Rosemary Davies, 7 October 1974, Milford, Utah, copy available at the Utah State Historical Society, Salt Lake City.
6. Martha S. Bradley, *A History of Beaver County*, 112.
7. Aird G. Merkle, ed., *Monuments to Courage: A History of Beaver County*, 255.
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16. Merkle, *Monuments to Courage*, 243.
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44. "Rich Ore Strike," *Beaver Press*, 3 May 1935.
45. *Beaver Press*, 28 June 1935.
46. *Ibid.*
47. "Quadmetals Will Resume Operations in Near Future," *Beaver Press*, 6 December 1935.
48. "San Francisco District Is Alive with Mining Activity," *Beaver Press*, 22 October 1937.
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60. "Beaver County's Minerals," *Beaver Press*, 26 May 1944.
61. "West Mountain District Attracts Eastern Capital," *Beaver Press*, 6 November 1943.
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64. "A Miner's Report of the Milford District Metal and Mineral Production during the War Years 1943-1945," *Milford News*, 25 October 1945.
65. "Milford Is Becoming Mining Capital of Southern Utah," *Beaver Press*, 25 January 1946.

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68. "Horn Silver to Resume Production Sept. 15; Mill Equipment on Way," *Milford News*, 4 September 1947.
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71. According to the executive summary produced to secure the original loan to purchase the rights, "The Company's properties include about 3,794 acres of patented mining claims either owned, under contract to be acquired, or leased, plus unpatented mining claims, State of Utah mineral leases, and 133.45 acres of fee lands in and near Milford. The total property holdings controlled or under contract aggregate about 40,532 gross acres, including substantial overlap of certain properties. The approximate total of net mineral acres controlled or under contract by the Company is about 37,700 net acres." "Executive Summary," Mining, 0396 WUC Copper Mine, Utah, \$8-Loan, <http://www.help-finance.com/download/0396-Eng.doc>

16—UINTA BASIN

John Barton

1. Many Utahns are unaware that nearly half of the Uinta Basin is in Colorado. Since the eastern rim is formed by the Rocky Mountains, Steamboat Springs, Meeker, and surrounding areas are part of the Uinta Basin. There are two accepted spellings for *Uinta*. "Uinta" is generally used for natural features such as the Uinta Basin or the Uinta Mountains, whereas "Uintah" is used for human institutions such as Uintah County and the Uintah Utes. Though not known to all basin residents or consistently used, this distinction explains the difference in spelling.
2. The Uintas have several peaks over 12,000 feet, and King's Peak is the highest in the state at 13,528 feet above sea level. King's Peak was named after Clarence King, early director of the U.S. Geological Survey. See John W. Vancott, *Utah Place Names*, 214.
3. Doris K. Burton, *A History of Uintah County*, 186.
4. For more information on Spanish mining and Indian folktales on the subject, see Gale R. Rhoades and Kerry Ross Boren, *Footprints in the Wilderness: A History of the Lost Rhodes Mines*; see also Gale R. Rhoades, *The Lost Gold of the Uintah's: The Rest of the Story*. Neither of these books is considered a credible source by most historians; however, they contain the most complete details of the many stories and folktales about the lost Rhoades Mines and other gold finds in the Uinta Mountains. See also chapter four of this book.
5. Jerry D. Spangler, *Paradigms and Perspectives: A Class I Overview of Cultural Resources in the Uinta Basin and Tavaputs Plateau*, 772.
6. At the start of the atomic era after World War II, uranium exploration peaked. Between 1949 and 1958, 161 tons of uranium ore was produced from several mines. The total yield was 648 pounds of U308 at .20 percent and 395 pounds of V205 at 0.16 percent. Uranium mining in the Uinta Basin was too limited in quantity and quality to continue, however. See Thomas D. Fouch et al., eds., *Hydrocarbon and Mineral Resources of the Uinta Basin, Utah and Colorado*.
7. See the "The Dredge Christened," *Vernal Express*, 23 October 1908.
8. Robert G. Pruitt, Jr., *The Mineral Resources of Uintah County*, 89. *Vernal Express* 25 July 1913. Later attempts also met with failure.
9. *Ibid.* See also Burton, *History of Uintah County*, 135.
10. Burton, *History of Uintah County*, 89–90. The Silver King Mine in the Uinta Basin should not be confused with the more famous and profitable mine in Park City.
11. *Ibid.*, 90.
12. *Ibid.*, 139.

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13. *Roosevelt Standard*, 18 April 1917.
14. *Roosevelt Standard*, 24 September 1919, 10 March 1920, 23 March 1921.
15. Burton, *History of Uintah County*, 140.
16. *Beehive History*: 23; see also George H. Hansen and H. C. Scoville, comps., *Drilling Records for Oil and Gas in Utah*, Bulletin 50 (February 1955).
17. By 1978 the Altamont/Bluebell field was producing 33,607 barrels of oil daily, which amounts to 39 percent of the oil output from the state; see Wayne L. Walquist, ed., *Atlas of Utah*, 211. This percentage dropped as drilling in the 1980s extended to additional new oil fields in Utah.
18. Utah is not usually thought of as an oil state, and the Uinta Basin is the exception. Additional limited drilling has occurred in several other counties, including San Juan, Emery, and Carbon.
19. Walquist, *Atlas of Utah*, 110.
20. *Ibid.* The 42 percent figure is an average. The percentages change somewhat from region to region throughout the state's oil-producing areas from year to year.
21. *Beehive History*: 23; Walquist, *Atlas of Utah*, 211.
22. *Vernal Express*, 28 September 1994. Local production did drop significantly with the oil glut. In 1984, 37,902,000 barrels of oil were produced in the state, and in 1988, the output was 33,017,000 barrels. However, the value of that oil was significantly different. The 1984 oil was valued at \$1,031,313,000, while 1988 production, although only 4.88 million barrels different, was worth only \$470,492,000—less than half due to the decline in oil prices per barrel.
23. *Vernal Express*, 28 September 1994. Drilling costs are higher in Utah than any other onshore state except Alaska and Louisiana.
24. *Ibid.*
25. The gross taxable sales for Duchesne County demonstrate the extent of the recession. The \$134,586,446 gross taxable sales in 1984 marked the peak of the county's growth. By 1988 the figure had fallen to \$71,468,095, a 53 percent decrease. See Statistical Abstract of Utah, 1990, table 8.
26. *Utah House Journal*, 1990, 121; see also *Utah Code Unannotated*, Title 59, chapter 5, paragraphs 101 and 102; Beverly Ann Evans, interview with the author, 5 December 1994.
27. Stephen Speckman, "Shale oil—now? Company says \$40 per barrel production is possible in Utah," *Deseret Morning News*, 2 June 2006, A1.
28. M. Dune Picard, ed., *Geology and Energy Resources, Uinta Basin of Utah*, 227.
29. Coal Mine Basin mines included the Farmers, Weeks, Wardle, Stringham, Pack-Allen, and Hartle Mines.
30. Pruitt, *Mineral Resources of Uintah County*, 67.
31. "Coal Mining in Ashley Valley," *Vernal Express*, 13 December 1928.
32. Carl Gardner, interview with the author, Vernal, Utah, 19 August 2002. Carl Gardner at the time of the interview had just turned 100 but could remember his experiences during the Depression well.
33. Geologists refer to gilsonite as *asphaltite*; another less-used name is *uintaite*.
34. Pruitt, *Mineral Resources of Uintah County*, 7.
35. Doris K. Burton, "The Strip," *The Outlaw Trail Journal*: 2–11.
36. Burton, *History of Uintah County*, 132.
37. John D. Barton, *A History of Duchesne County*, 79.
38. Charles William Smith, *From Then until Now*, 796.
39. *Daily Sentinel*, 18 January 1905; see also Burton, *History of Uintah County*, 93.
40. Marie Kaczmarek, "Ghost Town on the Old Uintah Railway," *The Outlaw Trail Journal*, (Winter 1993): 15–20.
41. Pruitt, *Mineral Resources of Uintah County*, 47.
42. Earl White, vice president of operations, American Gilsonite Company, interview with the author, Bonanza, Utah, 28 January 2003.

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43. Burton, *History of Uintah County*, 99.
44. For commercial mining of gilsonite, a vein must be at least five feet wide. Of the estimated 30 million tons of total gilsonite in Utah, much of it is in veins too small to justify mining.
45. Barton, *History of Duchesne County*, 128.
46. Burton, *History of Uintah County*, 147.
47. *Vernal Express*, 27 November 1991.