
***A View of the Lead Mines of Missouri*, by Henry Schoolcraft: The First Book Written on Mining on the Western Frontier**

By Robert Sorgenfrei

Henry Rowe Schoolcraft, if he is remembered at all today, is known for his ethnographic writings on Native Americans of the Great Lakes Region. His principal biographer, Richard G. Bremer, characterized him as an “Indian Agent and Wilderness Scholar.”¹ Largely forgotten is his contribution to American mining history in the form of his book, published by Charles Wiley in 1819: *A View of the Lead Mines of Missouri: Including Some Observations on the Mineralogy, Geology, Geography, Antiquities, Soil, Climate, Population, and Productions of Missouri and Arkansas, and Other Sections of the Western Country*. Schoolcraft’s book is the first published about the western mining frontier.

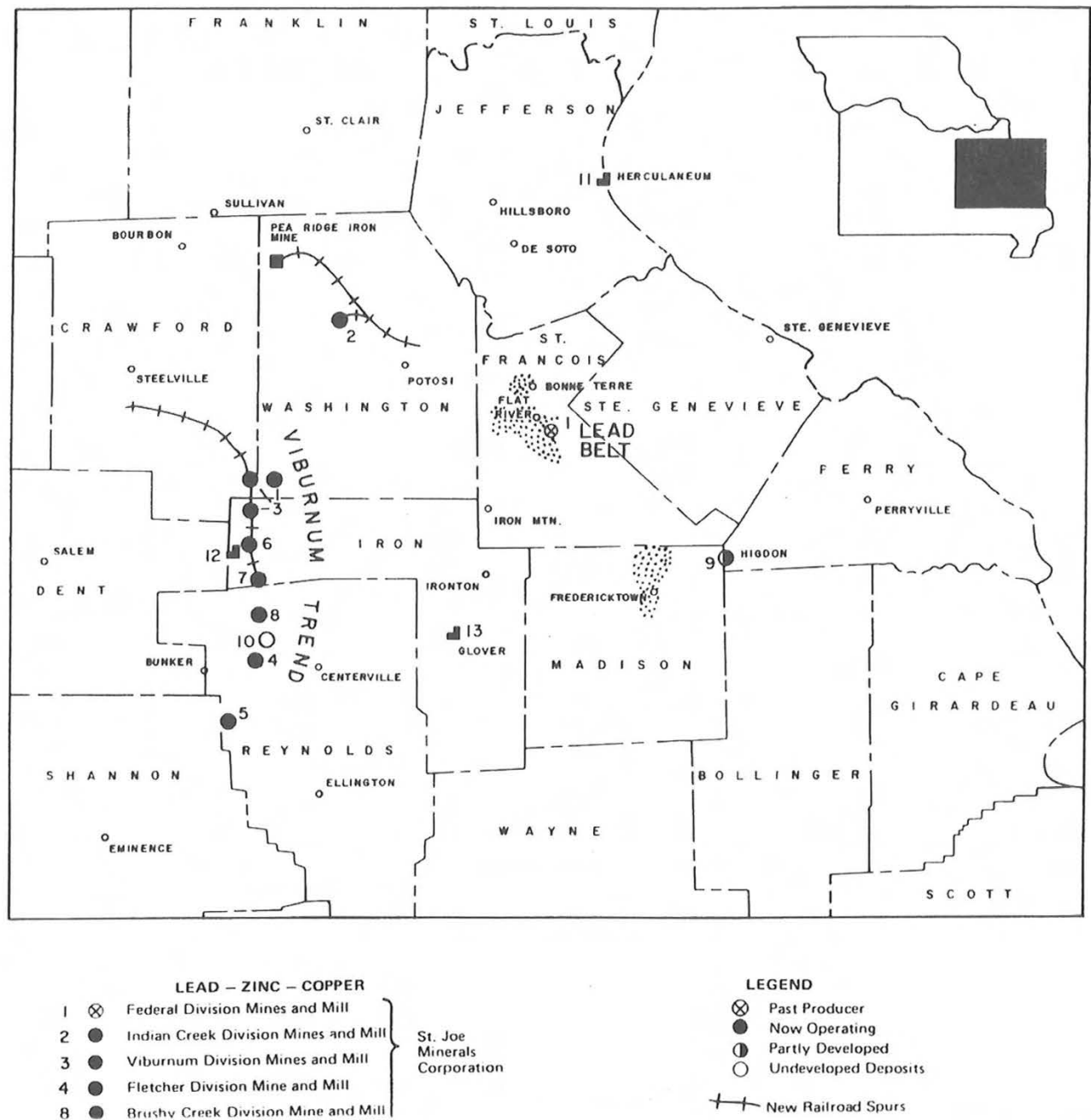
Henry Schoolcraft was born into a well-to-do family in 1793 near Albany, New York. Although he never went to college, he did attend schools in New York state and was very well read. He amassed a sizable library in the sciences, especially mineralogy. He was well versed in the chemistry of glass and in the technical aspects of its manufacture. Schoolcraft also became acquainted with Frederick Hall, a professor of natural philosophy at Middlebury College. Under Hall’s guidance, Schoolcraft carried out experiments in chemistry and mineralogy and became familiar with the chemistry involved in the smelting processes of the time. In 1808, he took over management of family-owned glass factories in New York, Vermont, and New Hampshire.

In 1815, following the end of the War of 1812, British-made glass flooded American markets at bargain prices. Schoolcraft’s glass products simply

could not compete against cheaper and better-quality British products. In 1817, Schoolcraft was forced to declare bankruptcy and liquidate his family’s business. Unable to remain and endure the humiliation of financial failure, Schoolcraft headed west to Missouri Territory.

With the Louisiana Purchase of 1803, Americans gained new western lands to explore and natural resources to exploit. French settlers had discovered lead in what became the Missouri Territory, and they had mined it on a small scale in the second half of the eighteenth century. In 1763, rich, near-surface lead deposits were discovered at Mine au Breton, and major mining activity shifted to the area around Potosi, in Washington County. In 1798, Moses Austin, father of Stephen Austin, obtained a Spanish land grant covering many of the important mines around Potosi. He also introduced improved mining and smelting techniques to the region.²

In 1804, Austin wrote an eight-page report on the mines in the region and submitted it to President Thomas Jefferson, giving the first accurate information on lead mining in the new territories west of the Mississippi. This lead mining region, centered around the counties of Washington, St. Genevieve, St. Francois, Jefferson, and Madison, is an area about seventy miles long and forty miles wide west from the Mississippi River. It covers about 3,150 square miles.³ Henry Schoolcraft may have become aware of lead mining in Missouri from the Austin Report, which had been widely circulated and published in *American State Papers, Public Lands*, vol. 1, a message from the President of the United



From: Wharton and Heyward, Geology and Ore Deposits of Selected Mines in the Viburnum Trend, (Report of Investigations, no. 58). Rolla, MO: Missouri Department of Natural Resources, Division of Research and Technical Information, Geological Survey, 1975. p. 2.

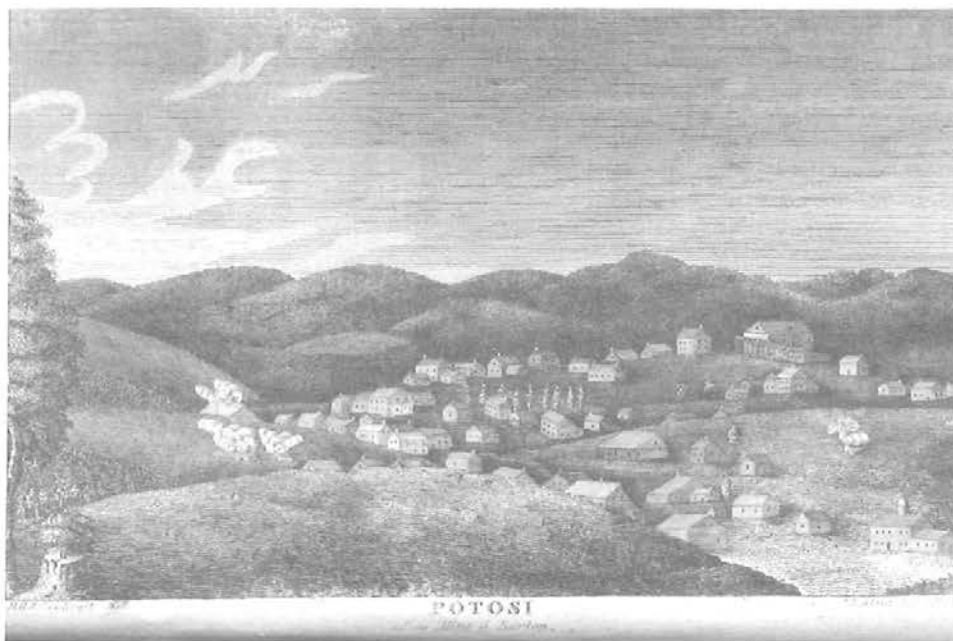
States to both houses of Congress, dated 8 November 1804.⁴

Schoolcraft was also likely drawn to the region because of his familiarity with the use of lead in the glassmaking process. Lead also was a commodity in demand for a variety of uses, including lead shot for firearms. He may have hoped to find an undiscovered lead deposit and open a mine, thereby restoring his family fortune. Alternatively, Schoolcraft, because of his familiarity with chemistry and mineralogy, may have hoped to find employment as a mine or smelter superintendent.⁵

In the late summer and fall of 1818, he began a detailed three month survey of mining and smelting operations in the lead mining region, and in the fall and early winter he ventured into the Ozarks, where he had heard of lead deposits not yet developed. Schoolcraft returned to the Missouri lead mining region in early 1819. After considering and then abandoning the idea of trying to develop lead mines on his own, he decided to write down the observations he had made on his journeys through the lead mining region.

One of Schoolcraft's perceptions was that the territory's mining industry was in great disorder and he advocated federal government regulation. He proposed that a superintendent or inspector of mines with a background in chemistry and mineralogy be appointed to the Missouri Territory. This official would lease out mines, collect royalties, compile statistics on lead production, and examine and report on the mineralogy of the region. Naturally, the person he thought best suited for this new position was himself. The book he produced from his writings and observations, *A View of the Lead Mines of Missouri*, was largely a self-promotional effort to be appointed Missouri Territory's first mining official. He hoped that the book would establish his credentials as a mining expert of some scientific standing and lead to a government job.⁶

The book was completed in late 1819; it consists of 294 pages of text and an index. It also has three engravings: one of the town of Potosi on the frontispiece; and two engravings within the text, one of a log hearth furnace for smelting lead ore, and the other of a furnace for smelting lead ash.⁷ The first 150 pages contain a geo-



View of the Town of Potosi taken from the frontispiece of the book.

graphic description of the lead mining region, along with a history of mining activities up until 1818. Schoolcraft described all of the major mines in the district, the techniques used in mining and smelting, and he provided a rough calculation of lead production. He also commented on government policy toward mining and suggested ways it could be changed to benefit the industry. He ended the first part of his book with an essay on the uses of lead.

The second part of the book contains Schoolcraft's observations on the area's "geography, mineralogy, geology, antiquities, soil, climate, population, and productions." These include a catalog of minerals and fossils discovered, and a journal of his trip up the Mississippi from the mouth of the Ohio River. The book's second part seems like it was grafted onto the first and, with the exception of the journal of his river trip, is of uneven quality. Had Schoolcraft chosen not to add this section to the book, it would have been of little loss to his readers.

The book had a print run of one thousand copies and sold for two dollars. Schoolcraft immediately sent copies of his book to various government officials whom he hoped would help secure him appointment as mine inspector. As a result, he did meet with some government officials, including Secretary of War John C. Calhoun. Calhoun offered Schoolcraft temporary employment as mineralogist on the government expedition to the Lake Superior-Upper Mississippi country under the command of Michigan Territorial Governor Lewis Cass. However, Schoolcraft was unsuccessful in realizing his ultimate goal of securing a permanent job as superintendent of mines for Missouri Territory. Sales of *A View of the Lead Mines of Missouri* were also disappointing. Schoolcraft had consigned 500 copies to a leading bookseller who returned 489 copies to him in December 1819.⁸

While *A View of the Lead Mines of Missouri* was a disappointment as a means of securing its



Portrait of Henry Schoolcraft taken some years after the publication of View of Lead Mines of Missouri. (Courtesy of the Historical Society of Wisconsin.)

author employment or providing significant income from sales, it has remained the only detailed, accurate account of early lead mining in Missouri. Schoolcraft was in some respects prescient in his writing about mining on what was then the far western frontier of the United States. He saw that mining methods were inefficient and wasteful and he advocated establishing a mining school in the region to teach and train experts in the manner of the German mining schools. He realized that the mining laws of the time, especially the three-year leasing regulations, were too restrictive. He proposed relaxing those restrictions to encourage the industry. Finally, he proposed that a position of territorial inspector or superintendent of mines be established. All of these things came to pass as the nineteenth century progressed.

A VIEW
OF THE
LEAD MINES OF MISSOURI:
INCLUDING
SOME OBSERVATIONS
ON THE
MINERALOGY, GEOLOGY, GEOGRAPHY,
ANTIQUITIES, SOIL, CLIMATE, POPULATION,
AND PRODUCTIONS
OF
MISSOURI AND ARKANSAS,
AND
OTHER SECTIONS OF THE WESTERN COUNTRY.

ACCOMPANIED BY THREE ENGRAVINGS

BY HENRY R. SCHOOLCRAFT,
CORRESPONDING MEMBER OF THE LYCEUM OF NATURAL HISTORY OF
NEW-YORK.

NEW-YORK:
PUBLISHED BY CHARLES WILEY & CO. NO. 3 WALL-STREET.
J. Seymour, printer.
1819.

Title page of the first edition, published in 1819 in a print run of a thousand copies.

Schoolcraft described mining in Missouri as follows:

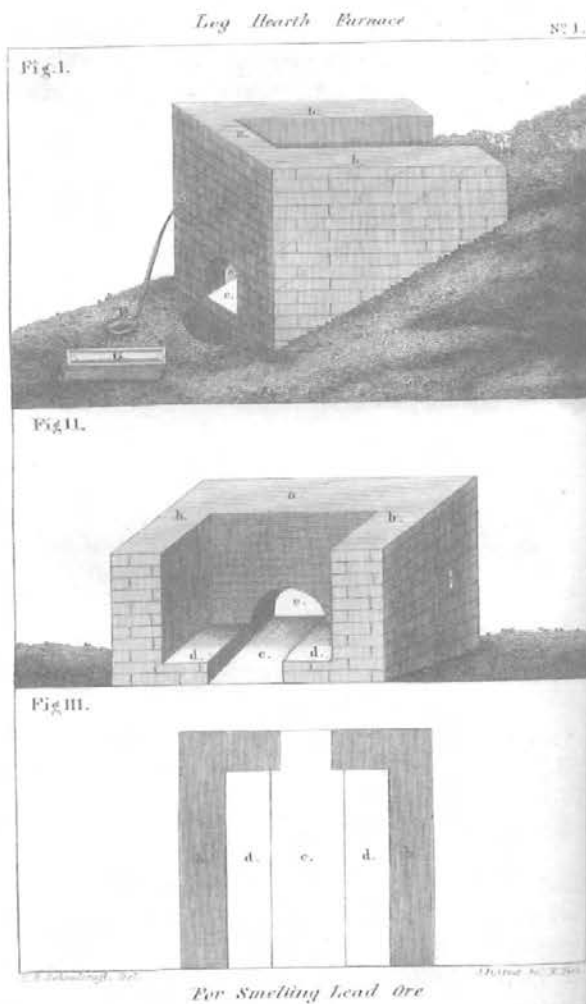
The method of raising the ores and the processes pursued in separating the metal ore, upon the whole, are extremely simple. A pick axe and shovel are the only tools in use for removing the earth, and the drill, rammer and priming rod are added when it is necessary to blast. Having determined the spot for digging, the process commences by measuring off a square of about 8 feet, and throwing out the earth, spar, and gravel, until the miner sinks beneath the depth he can throw the earth. A practiced hand will pitch his earth clear out of the pit from a depth of 10, 12, and even 15 feet. At this depth, a common windlass and bucket is placed over the center of the pit, and the digging continued by drawing up the earth, spar, and ores, if any are found, in the manner pursued in sinking a well.⁹

Schoolcraft went on to write that digging a shaft continued as long as promising ore was found. If good ore was not found, the pit was abandoned and work started again elsewhere. He noted that no one had exceeded a depth of eighty feet, and that good ore was to be found at a greater depth. This type of mining, with the exception the blasting, would have been familiar to Agricola in the sixteenth century. If nothing else, Schoolcraft's book serves as a benchmark for how far mining advanced technologically in the nineteenth century.

Schoolcraft eventually got a government appointment, but not in mining. He served for nineteen years as an Indian agent for tribes in the Great Lakes region. As a re-

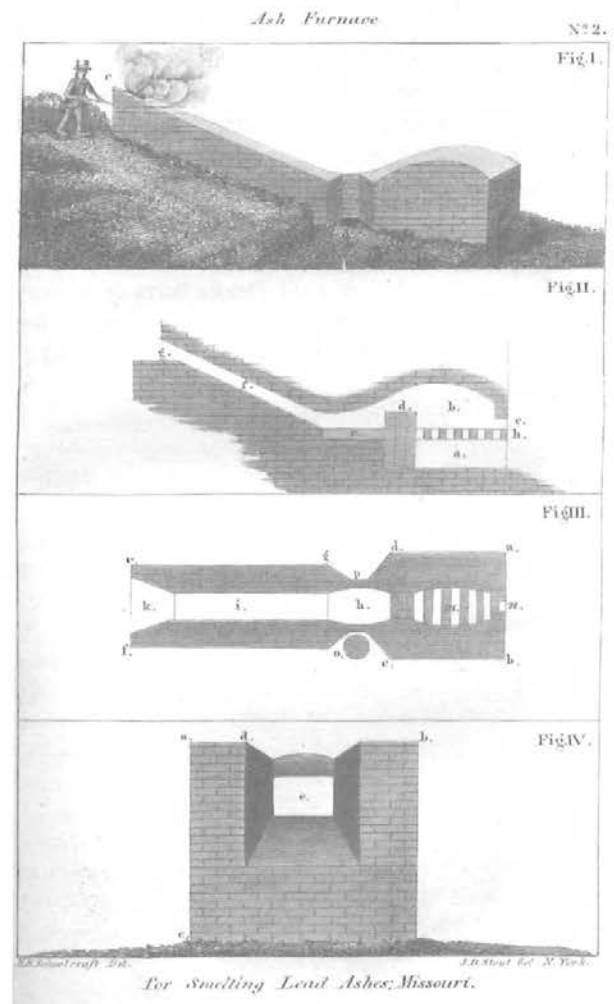
sult, he became an expert on Native American culture in the area and wrote a number of books on Native American ethnology. His best-known book is a six-volume work entitled *Historical and Statistic Information Respecting the... Indian Tribes of the United States* (1851-1857). Although of

uneven quality, it remains a standard reference work on Native American culture of the mid-nineteenth century. Schoolcraft died in 1864 after a long illness, the same year that the first mining school was established in the United States. 🏠



Log hearth furnace. Primary smelting of the lead ore was done in furnaces like this in early 19th-century Missouri Territory. The smelting technique was little changed from the 16th century.

Lithograph from View of the Lead Mines of Missouri.



Ash furnace. This furnace was used in a secondary smelting process that further smelted lead out of lead ash that was left after the primary smelting was done in the log hearth furnace.

Lithograph from View of the Lead Mines of Missouri.

Notes:

- 1 Richard G. Bremer, *Indian Agent and Wilderness Scholar: The Life of Henry Rowe Schoolcraft* (Mount Pleasant, Mich.: Clarke Historical Library, Central Michigan University, 1987).
- 2 Henry Cobb, "Notes on the History of Lead Mining in Missouri," in *Report of the Geological Survey of the State of Missouri, Including the Field Work of 1873-1874* (Jefferson City, Missouri: Regan & Carter, State Printers & Binders, 1874), 672-685. Due to various European settlements, France deeded the Louisiana Territory to Spain in 1762, regained sovereignty in 1800, then sold it to the United States in 1803. Duane Meyer, *The Heritage of Missouri: A History* (St. Louis: State Publishing Company, 1973), 761-2.
- 3 Henry Schoolcraft, *A View of the Lead Mines of Missouri: Including Some Observations on the Mineralogy, Geology, Geography, Antiquities, Soil, Climate, Population, and Productions of Missouri and Arkansas[sic] and Other Sections of the Western Country* (New York: Charles Wiley, 1819), 26-33.
- 4 Moses Austin, "Description of the Lead Mines in Upper Louisiana," in *Report of the Geological Survey of the State of Missouri*, 686-694.
- 5 Bremer, *Indian Agent and Wilderness Scholar*, 15.
- 6 Bremer, *Indian Agent and Wilderness Scholar*, 23.
- 7 The lead ore was first roasted in the log hearth furnace. After the lead ore was roasted, ore that was not completely desulphurated was termed slag or lead ash. Lead ash was washed to get rid of wood ash from its initial smelting. This material then underwent secondary smelting in the ash furnace, with wood again used as the fuel. The ash furnace smelted lead ash down to the point where lead could be recovered from it.
- 8 Bremer, *Indian Agent and Wilderness Scholar*, 24.
- 9 Schoolcraft, *A View of the Lead Mines of Missouri*, 90.