Survey in an Instant: The Autumn Travels of David Dale Owen, 1839

**By Stephanie Saager-Bourret,
Past President of the
Mining History Association**

The role of the federal government in the administration of land, particularly mineral land, has a checkered history. Legislation passed in 1807 and 1816 for the organization and governance of the Northwest Territory removed from general sale any public land that might contain lead mines or salt springs. One of the regions affected by this legislation lay in the upper Mississippi River Valley, where Illinois, Iowa, and Wisconsin converge on the river's shores.

These mineral lands were administered by the Ordnance Bureau of the War Department through an officer stationed at Galena, Illinois. The system was cumbersome at best. With no one in the field to monitor mining activity and enforce the regulations, by 1825 the officer in charge was reporting to Congress that losses to the government were "almost incredible."[1] Throughout the 1830s calls were made to abandon the leasing system and offer all the lands for public sale. A compromise was reached by 1834, wherein potential buyers could swear an oath that the land they were purchasing contained no mineral deposits. This only made the situation worse. Added to the likelihood of outright fraud was the fact that the government had no reliable information for land-office officials to use to verify or deny buyers' claims.

To settle matters once and for all, on February 6, 1839, Congress requested that President Martin Van Buren provide it with the needed information:

> *Resolved,* That the President of the United States be requested to cause to be prepared and presented to the next Congress, at an early day, a plan for the sale of the public mineral lands, having reference as well to the amount of revenue to be derived from them, and their value as public property, as to the equitable claims

> of individuals upon them; and that he, at the same time, communicate to Congress all the information in possession of the Treasury Department relative to their location, value, productiveness, and occupancy; and that he cause such further information to be collected, and surveys to be made, as may be necessary for these purposes.[2]

In order to provide the needed information, President Van Buren passed the request down the chain of command to the General Land Office and its commissioner, James Whitcomb of Indiana. Whitcomb was aware that a geological survey of Indiana had just been completed by fellow Hoosier David Dale Owen. Believing that Owen was the man to take on this new task, Whitcomb commissioned him on July 31, 1839, and followed up on August 8 with detailed instructions to examine all of the lands in the Mineral Point and Galena land districts, which were situated south of the Wisconsin and north of the Rock rivers, and west of the line dividing ranges eight and nine east of the fourth principal meridian. Also to be included were all of the surveyed lands in the Dubuque land district, for a total of upwards of three hundred townships of land. Owen received his commission and instructions at his home in New Harmony, Indiana on August 17, 1839.

David Dale Owen

Who was this man who inspired such confidence? David Dale Owen was the son of Robert and Ann Owen, born in New Lanark, Scotland, in 1807, where Robert was managing the cotton mill of his father-in-law, David Dale. Owen was a progressive manager, sensitive to the living and working conditions of his employees. He instituted some of the earliest reforms of workers' hours and wages, housing, and education, with a special emphasis on the conditions of children.

By the early 1820s, Robert Owen's progressive program of reforms was meeting with resistance from the more conservative mill owners, and he began to look for another opportunity to test his ideas on communal living and working. He learned of a property for sale in the United States, in Indiana along the Wabash River. New Harmony had been founded in 1814 by a German pietist-utopian sect, which by 1824 was looking for a new place to settle. Robert Owen and his partner, William Maclure, purchased the entire village in 1825 as a fresh place to start, with no cultural baggage to get in the way of their own utopian ideas in their "Community of Equality".

David Dale Owen. (Used by permission of the Smithsonian Institution Archives, RU7177, George P. Merrill Collection.)

While his father was pursuing his project in New Harmony, David Dale Owen was in school, first in Hofwil, Switzerland, then in Glasgow, Scotland. His interest in chemistry had been ignited, and he saw the subject as the best contribution he could make to the success of his father's dream for New Harmony. Dale, as he was referred to by his family, arrived at New Harmony in January 1828, ready to use his knowledge of chemistry for the benefit of the community. Unfortunately, the Owenite community had dissolved in 1827, leaving Dale adrift with no concrete plans for his future.

Having spent some of his ample free time in the New Harmony print shop, in 1830 he joined his brother Robert in New York. There Dale worked in the printing office of the magazine *Free Inquirer*, which Robert served as editor. Dale also worked hard on perfecting his drawing and painting skills. Now he had three possible avenues to take for his future: chemistry, printing, and art. The balance was tipped when he attended lectures in New York given by Henry Darwin Rogers, a young chemistry professor. Dale headed to London in 1831 and enrolled in the University of London. There his interest in chemistry was fully rekindled, and he began to take a more serious interest in the related aspects of geology.

The Owen family had retained ownership of its share of the New Harmony property after the Owenite community had dissolved. Dale and other family members returned to the village in 1833 to take charge of the property in the hopes of making it profitable. Dale again worked to improve his chemistry laboratory, while working on projects of benefit for the community. He delivered a popular series of science lectures during the winter of 1833-34, demonstrating his skill at making complex ideas understandable to the layman. This skill would serve him well in the future.

Up to this time, chemistry was the sole focus of Owen's professional attention. He continued giving his popular lectures, becoming a source of scientific information for the town and beyond. His chemical investigations slowly but surely led him more deeply into the study of geology, so much so that in 1835 he decided to make geology his life's work. To help him with his study of paleontology, he enrolled in the Medical College of Ohio, studying anatomy and physiology. Owen studied enough medicine to graduate with a medical degree, which he never put to professional use.

Shortly after his return from medical school, David Dale Owen married Caroline Neef, daughter of a New Harmony schoolteacher. They made a honeymoon trip to Mammoth Cave in Kentucky in late March 1837. The trip was necessarily short, because Owen had been commissioned to conduct the first geological survey of Indiana, commencing on March 31, 1837, and concluding in January 1839. It was this body of work that brought him to the attention of James Whitcomb, commissioner of the General Land Office.

Conducting the Survey

The task that Owen had been commissioned to complete was a daunting one. He had to organize, staff, and conduct a survey covering approximately eleven thousand square miles in less than four months—actually less than three months, taking the upper Midwest's weather into consideration. The country the survey would be traversing was sparsely settled, with difficult travel and transportation issues. Owen's initial reaction was that the task could not be accomplished in the allotted time. But, after further consideration, he "finally arrived at the conclusion, that, by using diligent exertion, assuming much responsibility, and incurring an expense which I was aware the department might possibly not have anticipated, I might, in strict accordance with my instructions, if favored by the weather and in other respects, succeed in completing the exploration in the required time." [3]

Owen estimated that the survey would cost fifteen to twenty thousand dollars, an amount that

was probably larger than the Land Office anticipated, but he interpreted his instructions to mean that results were required, no matter the cost. By the time the Treasury secretary questioned the cost estimate, Owen was in the field, and part of the survey had been completed. Commissioner Whitcomb loyally stood by Owen, pointing out to the secretary that if the government stopped the survey then, the money it had already spent would be wasted and it would be no closer to a solution of the mineral lands problem.

Because of the time constraints that he had been put under, Owen had permission to hire as many subagents and assistants as he felt necessary to complete the job in the allotted time. Along with noting things like soil types, timber sources, geologic features, and active mines, these men had to communicate the purpose of the survey to the settlers, reassuring them that their future rights to the land would not be in jeopardy. He recruited twenty members of the survey from New Harmony, men who had attended Owen's science lectures and already had a basic knowledge of geology.

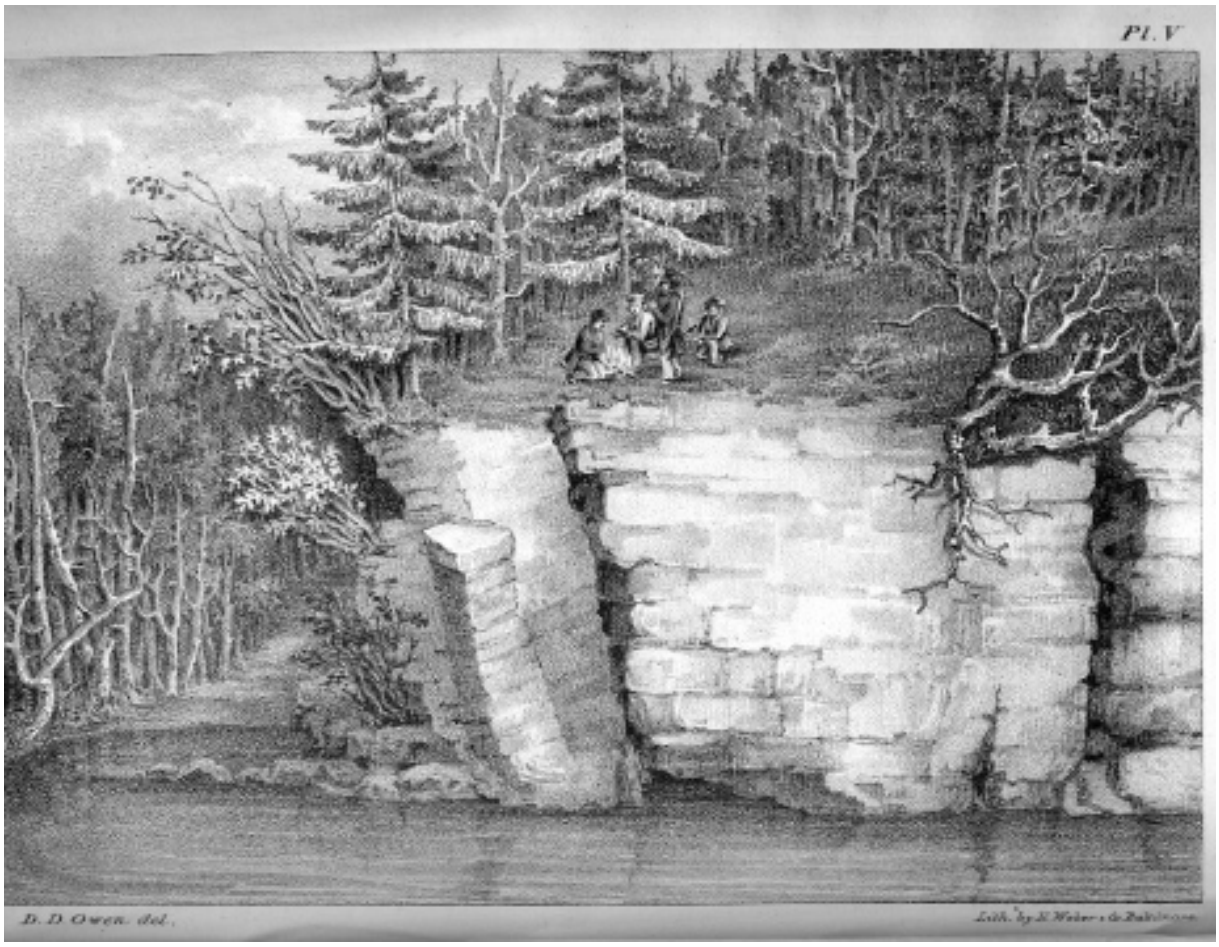
The group left New Harmony and traveled via riverboat down the Ohio River and up the Mississippi River to St. Louis, where Owen spent three thousand dollars of his own money to purchase provisions and camp equipment, including tents, for the entire expedition. More men were hired, for a total of 139 subagents and assistants to be paid four and two dollars per day respectively. Owen instructed the subagents in the elementary principles of geology, and he supplied them with simple tests to accurately identify minerals in the field. The men and equipment boarded another riverboat and continued up the Mississippi River. Owen used the time on board to continue teaching his assistants the tasks they would need to perform. They arrived at Rockingham, Iowa, near the mouth of the Rock River on September 17, one month to the day from Owen receiving his instructions for conducting the survey.

Owen divided the group into twenty-four working corps, each in charge of a subagent, with four to five assistants per corps. The corps were stationed along the township lines at the boundary between the Burlington and Dubuque land districts. A set schedule of times and places was arranged by Owen for the corps to make their reports to him. In order to finish the survey on time, Owen calculated that each corps would need to examine an average of thirty quarter sections (4,800 acres) per day. Considering that these lands were located in the Driftless Area, meaning steep hills and deep valleys, this would be no mean feat!

Owen crisscrossed the district, keeping the corps on schedule and personally examining areas of special interest. He was assisted in this task by Dr. John Locke, professor of chemistry at the Medical College of Ohio. Owen had personally requested the assistance of Locke and made him his chief assistant. On October 20 the survey of the Dubuque district was completed, and Owen and Locke were personally re-examining the townships along the Mississippi, the location of the most heavily mineralized lands in the district.

The weather and the realities of camp life contributed to illness among the men. Several became so sick that they had to be relieved, and one died, on October 2, of what was called congestive fever. New York newspapers even reported Owen's own death, which probably amused him greatly. He was in good health and excellent spirits, able to shrug off the discomforts and hardships of his outdoor life. He did make one concession, hiring a French-Canadian voyageur to act as camp cook. His special duty was to pitch the tents to withstand the whipping winds of thunderstorms. On one particularly harrowing night, camped on the bank of the Mississippi, the men had to scramble out of their beds to hold the tent poles down.

Crossing the Mississippi River to the east side, the survey continued in the Mineral Point district in Wisconsin Territory. This region's survey was completed on November 14, and all of the field work was finished ten days later in Stephenson, Illinois, on a day that a snowstorm blew in and the temperature dropped below zero. It would have



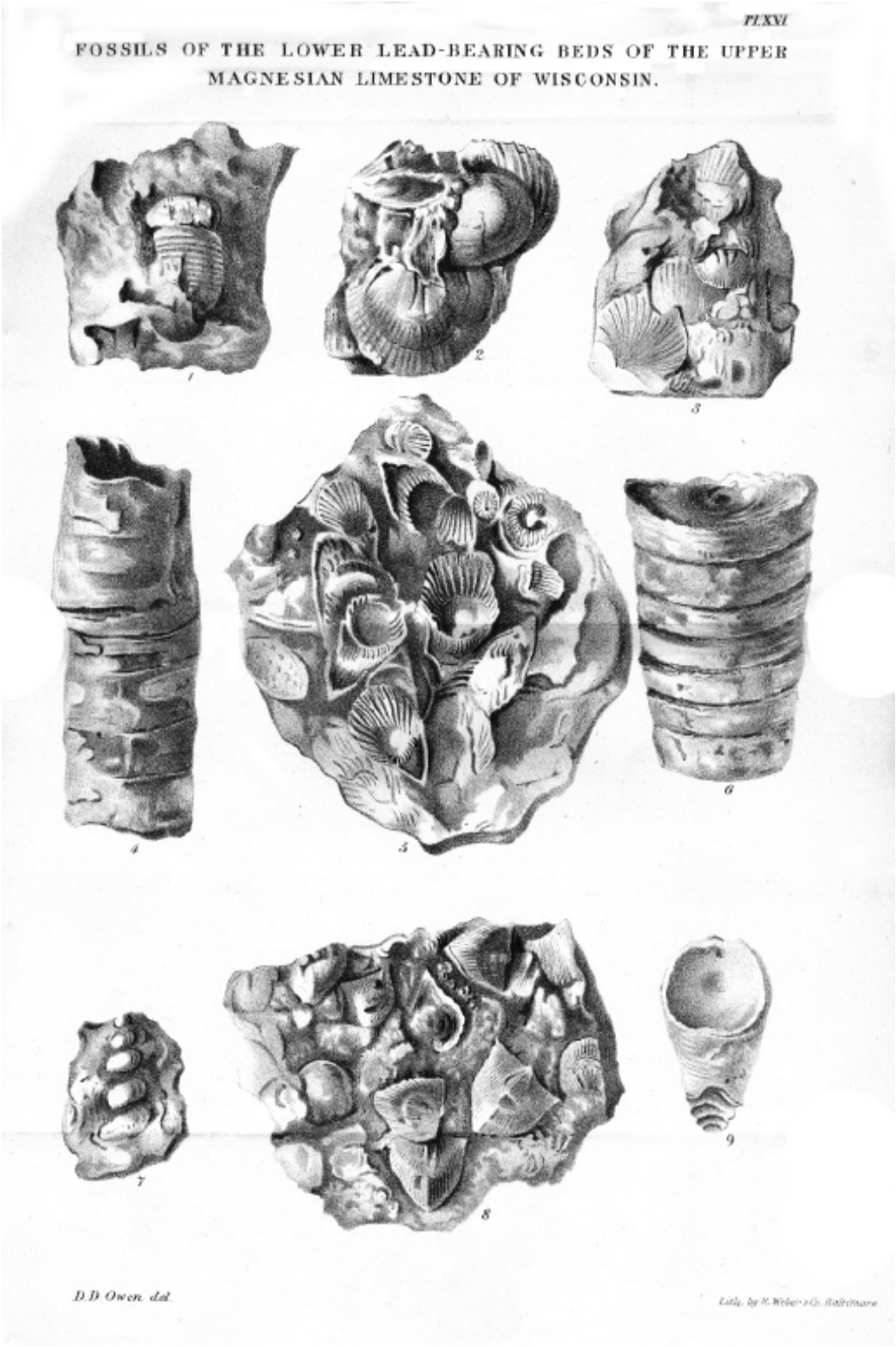
Cliffs along the Mississippi River, approximately two miles below Dubuque, Iowa, as drawn by David Dale Owen. (David Dale Owen, "Report of a Geological Exploration of Part of Iowa, Wisconsin, and Illinois," Pl. VIII. From the collections of and courtesy of the Mining and Rollo Jamison Museums, Platteville, WI.)

been impossible to continue the survey work one day longer!

Processing the Survey

Owen would go on to conduct other surveys, in northern Wisconsin and Minnesota, Kentucky and Arkansas, but he always considered this one to be his best piece of work. The survey was completed in two months and six days, with the loss of only one life. But for Owen, the job was only half done. He now faced the task of collating the data, writing the report, and drawing the maps, diagrams, and illustrations he wanted to include in the final report.

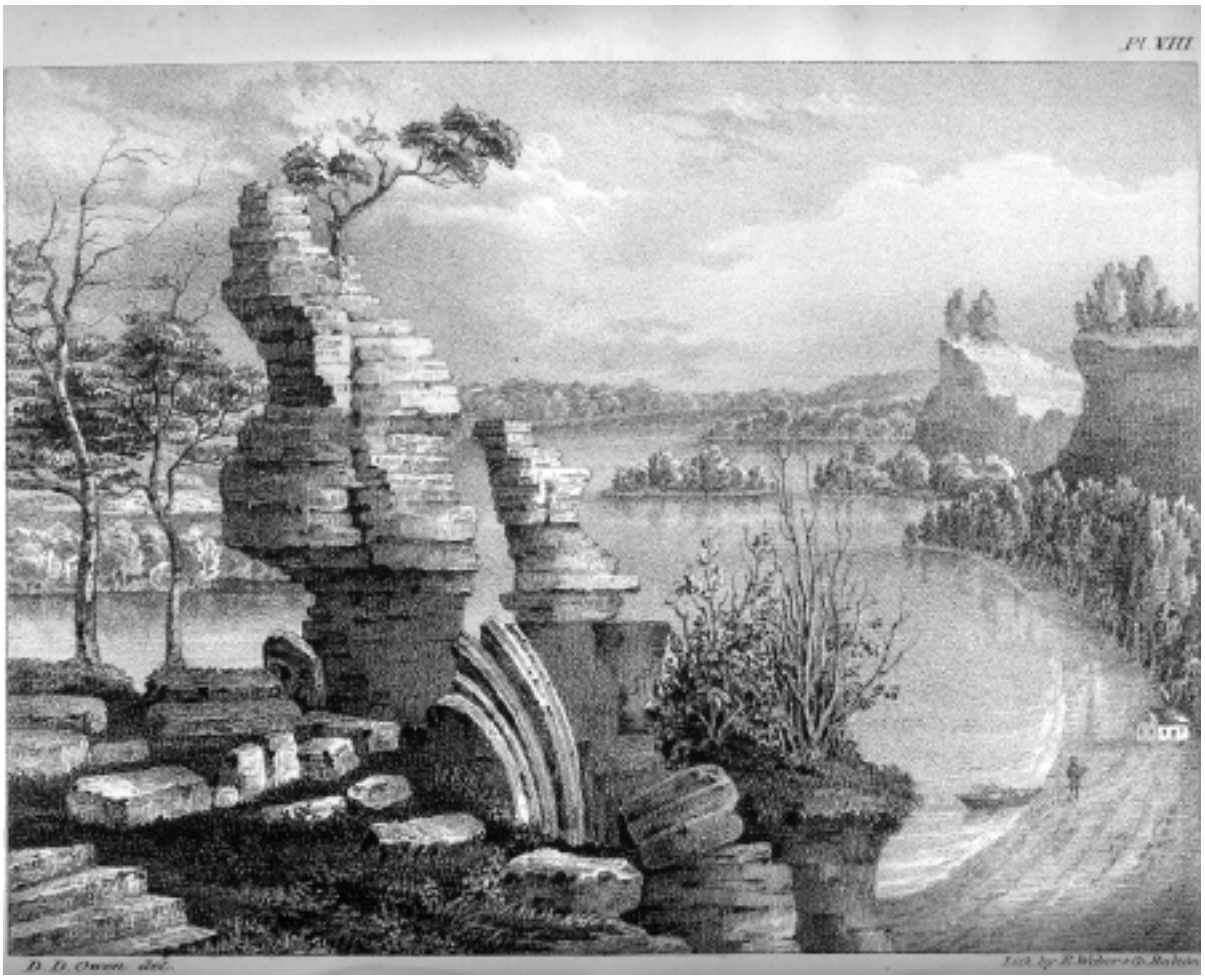
The first task he took on was drafting the maps of the areas surveyed. These maps showed the exact location of mineral veins and deposits, and the sites of actual mining operations and of smelters. They fulfilled the primary purpose of the survey by providing the Land Office with accurate information about the areas that should be opened for outright sale. Owen sent the maps to Washington in early February 1840, and followed up with an appendix that described the physical features of each township, including the proportion of timber and prairie land in both the Dubuque and Mineral Point land districts.



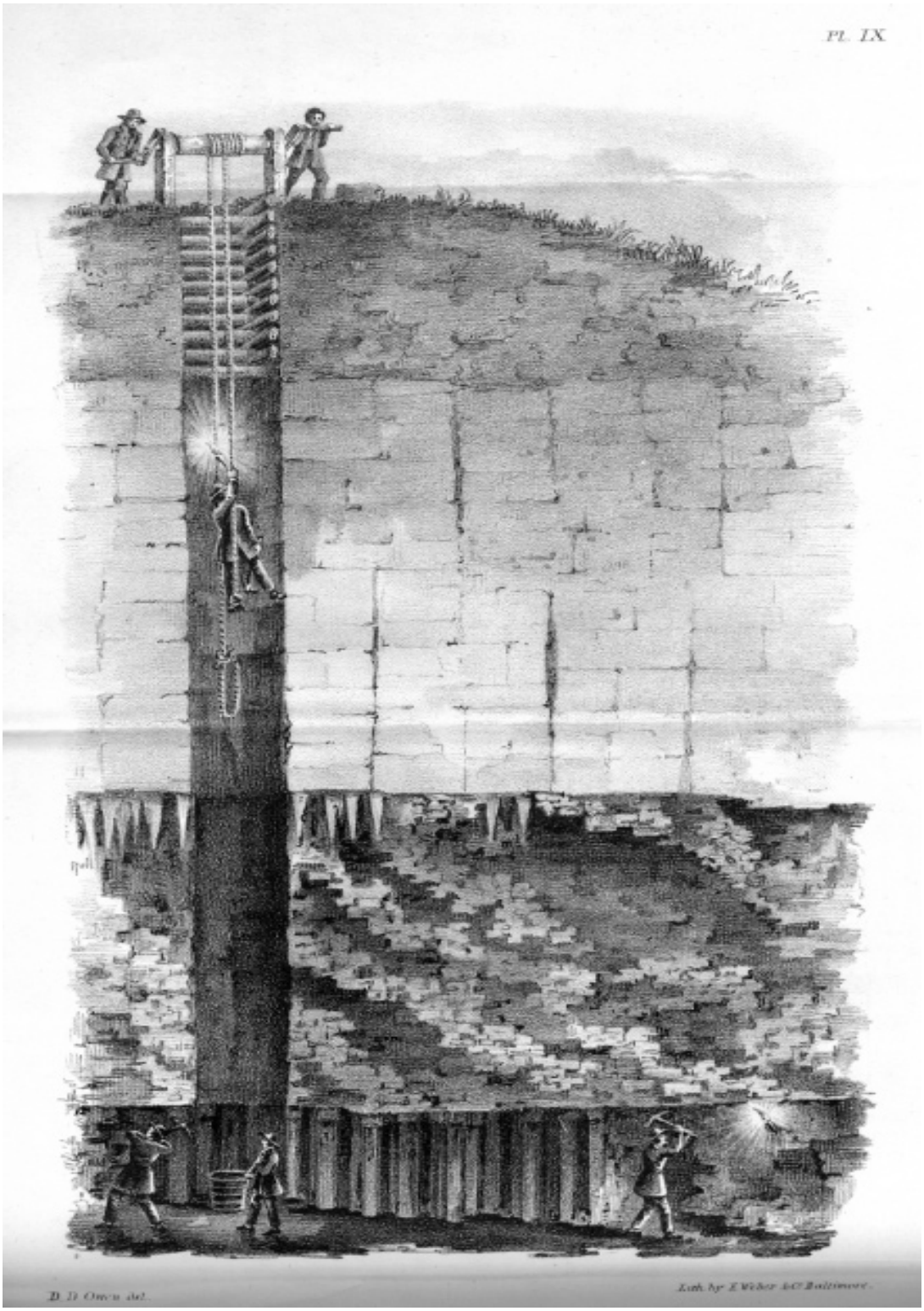
Fossils of the Lower Lead-Bearing Beds of the Upper Magnesian Limestone of Wisconsin. [Some of the specimens shipped to Washington, D.C.] (Owen, "Report of a Geological Exploration," Pl. XVI. From the collections of and courtesy of the Mining and Rollo Jamison Museums, Platteville, WI.)

Thousands of rock, soil, mineral, and fossil specimens had been collected during the survey, and Owen sorted and classified them and wrote a descriptive catalog. Each sample could be traced back to its original location on the township maps. This collection was shipped to Washington, D.C., in September 1840, ultimately to become part of the national museum, the Smithsonian Institution. Unfortunately, due to the passage of time and many location changes, this collection has lost its identity, and it is not possible to identify the specimens that Owen so carefully collected and catalogued.

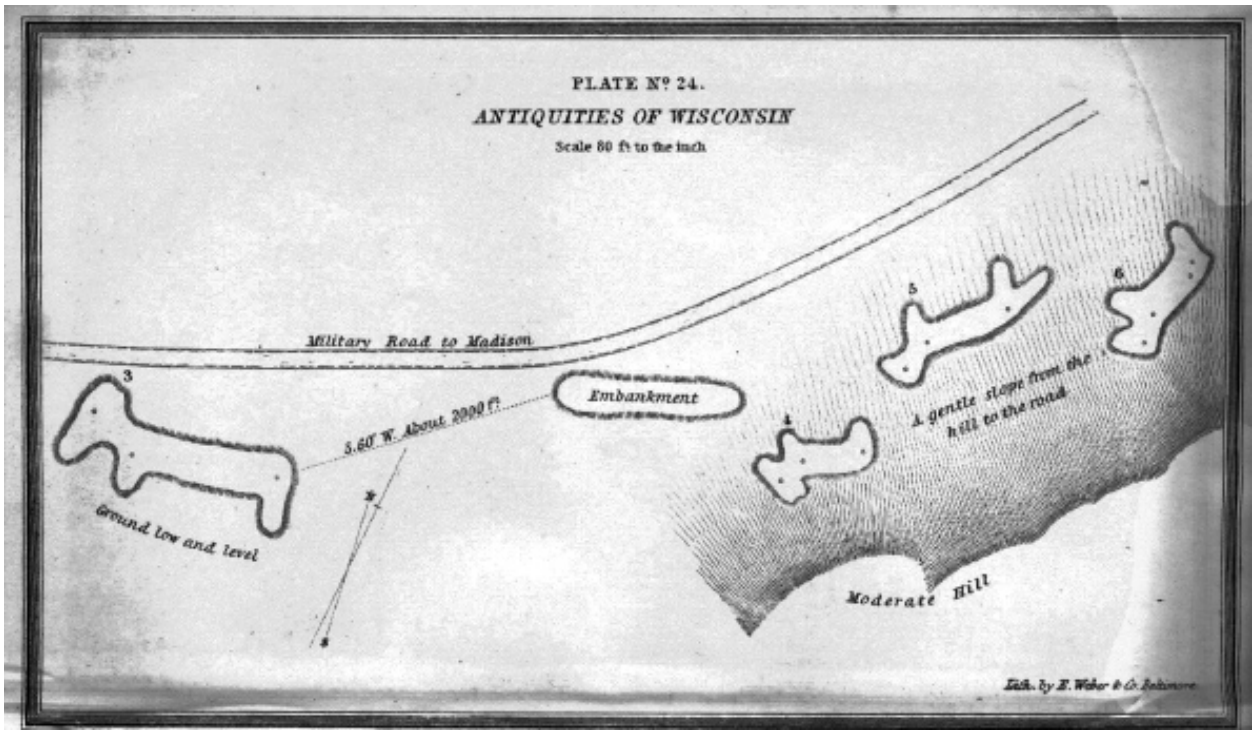
Owen next turned to the written report. It was here that his talent for making complex ideas understandable came to the fore. One of the things that made him popular with his fellow residents at New Harmony was his talent for explaining complex scientific principles without making his audience feel like they were ignorant. Owen knew that the readers of his report would be a mix of fellow scientists, interested amateurs, potential settlers, mining interests, and Washington politicians. To accompany the written words, he also wanted to include maps, tables, diagrams, and pictorial elements. By the end of February 1840, Owen was busy writing.



Example of limestone cleavage, forming vertical and perpendicular cliffs, as drawn by Owen. (Owen, "Report of a Geological Exploration," Pl. V. From the collections of and courtesy of the Mining and Rollo Jamison Museums, Platteville, WI.)



Exhibiting a vertical section of a lead mine, drawn by Owen. This is the iconic image of a nineteenth-century lead mine in Wisconsin. (Owen, "Report of a Geological Exploration," Pl. IX. From the collections of and courtesy of the Mining and Rollo Jamison Museums, Platteville, WI.)



Antiquities [effigy mounds] of Wisconsin. (Owen, "Report of a Geological Exploration," Pl. 24. From the collections of and courtesy of the Mining and Rollo Jamison Museums, Platteville, WI.)

Out of 161 total pages of text, Owen was responsible for 113 pages. These included a description of how the survey was conducted; an outline of the country explored and its geological character; a description of "cliff limestone"; a comparison of the Iowa-Wisconsin lead region with that of northern England, then the most productive lead region in the world; descriptions and statistics for lead mines; descriptions of other ores present in the region—copper, zinc, iron, coal; a report on other stone resources; a report on the soils of the region; a catalog of geological specimens collected; and the previously mentioned appendix containing detailed descriptions of the townships surveyed.

The bulk of the rest of the writing came from the pen of John Locke, Owen's chief assistant. Locke included a geological comparison of the lead region to Ohio, Indiana, and Kentucky; descriptions of stratigraphic sections observed in various parts of the region; altitudes of high points; "terrestrial magnetism" observations; a survey of some of the "earthwork antiquities" (effigy mounds) found in the region; and weather and climate observations. Subagent Ebenezer Phillips wrote the final three pages, describing the "timber, soil, and productiveness of the mineral district".

To accompany the text, Owen produced maps, diagrams, charts, and sketches. His skill as an artist, as well as his training as a printer, came in handy. Numerous plates of illustrations and several maps are included with the printed report. This does not include the maps previously sent to the Land Office in Washington.

The Report Goes to Washington

The complete report—text, tables, diagrams, sketches, maps—dated April 2, 1840, was sent to Commissioner Whitcomb. He presented it to the U.S. House of Representatives on June 4 with

the following words:

> The report of Dr. Owen, and the documents which accompany it, contain highly valuable information as sought for [*sic*] by the resolution; and, considering the very short time allowed him for completing the examinations in the field before the setting in of winter, he has exceeded the most sanguine expectations of the department, in the prompt and satisfactory manner in which he has discharged the important duties which were confided to him; and should Congress be pleased to order the publication of the report, with its illustrations and accompanying maps, I feel assured that it will greatly subserve the public interests, by promoting the early sale and settlement of the lands of which it treats, and, at the same time, prove a highly valuable acquisition to the cause of science. [4]

Along with the report and the supporting documents, Owen sent the last bills for the expedition. The total expense came to thirty-four thousand dollars, considerably more than his original estimate of fifteen to twenty thousand dollars, but everyone was so pleased with the results that there were no major complaints.

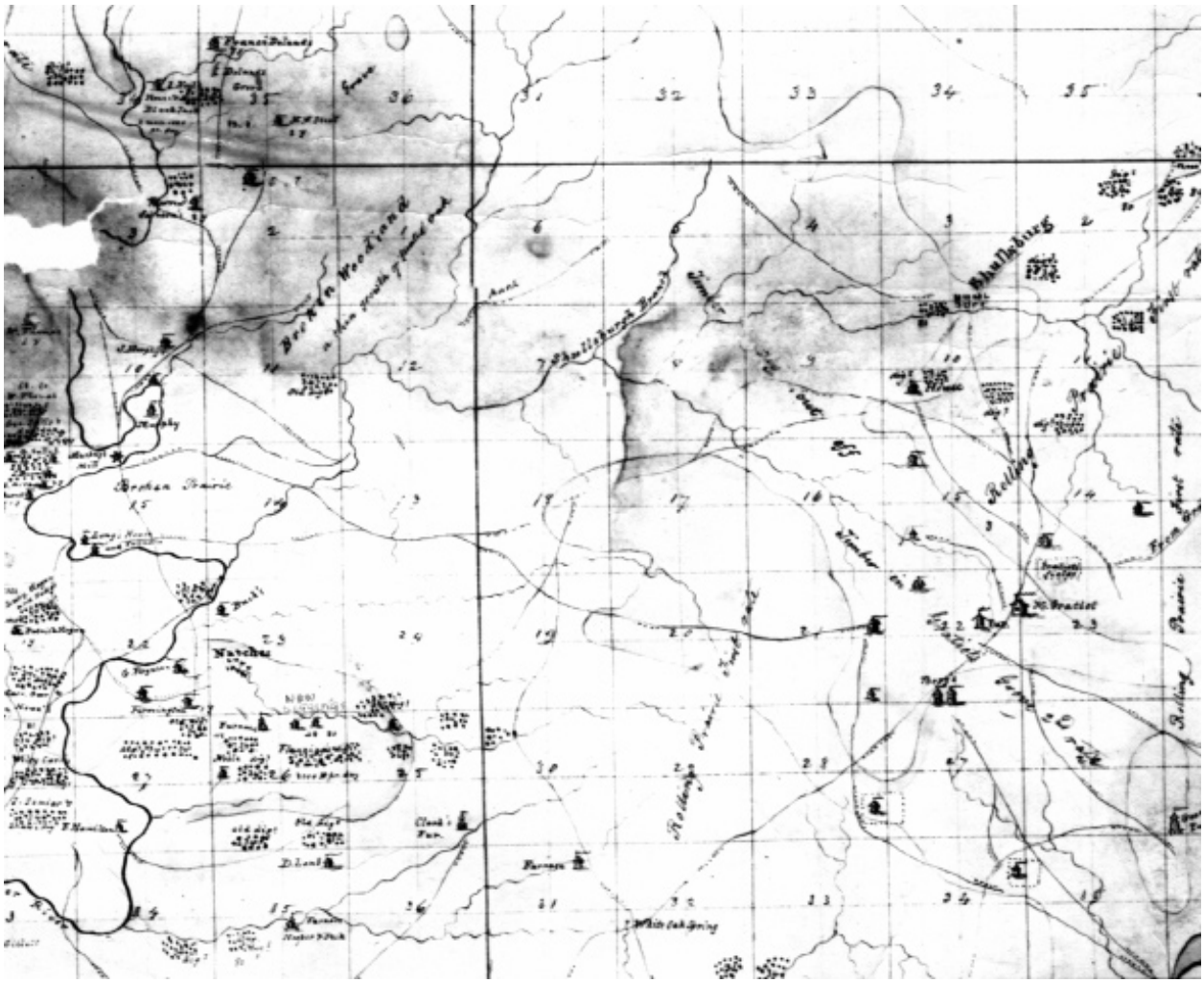
The House ordered the report to be printed on June 6, but without the diagrams, sketches and maps because the printing cost estimate came in too high. Both Owen and Whitcomb insisted that the report would lose much of its value without the supporting documents, but the report was printed in the usual Congressional format as Executive Document No. 239.

Even without the illustrations, the report was received by all of its intended audiences with instant and widespread acclaim, and David Dale Owen was hailed by his contemporaries as one of the foremost geologists in America. The General Land Office soon ran out of its allotted copies, and Commissioner Whitcomb told Owen that another edition would soon be requested. However, in spite of this success, it took four years and a lengthy memorial from a special committee of the Association of American Geologists and Naturalists to spur Congress to action. In 1844 the Senate ordered fifteen hundred copies of the complete report—with maps, diagrams, and sketches—as Senate Document No. 407, and the House ordered five thousand additional copies of the complete report.

Since its arrival in Washington, D.C., in 1840, the report has had a difficult life. It seems that most of the maps and illustrations were misplaced shortly after its presentation to the House of Representatives. A "very diligent search"[5] was unable to recover the documents, and it would appear that Owen had to recreate at least some of the maps and illustrations so that they could be printed in 1844. And, per general practice at the time, the lithographer probably threw out the second set of illustrations once the plates were approved for printing.

Part of the large township plat map resurfaced in 1937 or 1938, when materials that had been stored in the Capitol Building and the Senate Office Building were transferred to the new National Archives Building. When one bundle was unrolled, it was found to contain four long sheets of a manuscript map, which, when put together comprised a map of southwestern Wisconsin on a scale of one inch to one mile. The sheets were in extremely poor condition, mildewed and water stained and with pieces missing. Archives staff in the Document Reproduction and Preservation Branch cleaned the map, then cloth-backed and laminated the sheets, the best options available at the time. The title, authority, source, date of preparation and scale were missing, but it was soon determined to be Owen's map from 1840. A search was made for the missing sections, but none have been found.

Taken as a whole, the survey conducted by David Dale Owen in the autumn of 1839 stands



Section of the one-inch to one-mile manuscript map of southwest Wisconsin, showing parts of Township T.1N–R.1E and Township T.1N–R.2E as drawn by David Dale Owen. Note the numerous digs, furnaces, and notes regarding land characteristics. (National Archives Record Group No. 46, 26A-F-G. From the collections of and courtesy of the Mining and Rollo Jamison Museums, Platteville, WI.)

as one of the great accomplishments in nineteenth-century American geology. Not only did he organize and staff the expedition, he personally supervised every aspect of it, read every report from his subagents, and examined hundreds of especially interesting sites himself. His final report, along with the detailed maps, satisfied every goal laid out for him in his commission from the General Land Office. The report contains a wealth of information for the modern researcher, providing a view of the Upper Mississippi Valley Lead-Zinc District that is available nowhere else.[6]

Stephanie Saager-Bourret is the retired curator of the Mining and Rollo Jamison Museums of Platteville, Wisconsin, located in the Upper Mississippi Valley Lead and Zinc District. She holds an M.A. in History and Museum Studies from Case Western Reserve University and a B.A. in History from the University of Wisconsin-Madison. Stephanie has served on the Mining History Association's Council and is a member of the Beselme-Orrell Mining Heritage Award committee.

Notes:

1. Walter B. Hendrickson, *David Dale Owen, Pioneer Geologist of the Middle West* (Indianapolis: Indiana Historical Bureau, 1943), 42.
2. U.S. Congress, *Journal of the House of Representatives of the United States: Being the Third Session of the Twenty-fifth Congress*, Serial 343 (6 Feb. 1839), 487.
3. David Dale Owen, "Report of a Geological Exploration of Part of Iowa, Wisconsin, and Illinois, Made Under Instructions from the Secretary of the Treasury of the United States, in the Autumn of the Year 1839; With Charts and Illustrations," S. Doc. 407, 28 Cong., 1 sess., Serial 437, 12.
4. Owen, "Report of a Geological Exploration," 4.
5. Herman R. Friis, "The David Dale Owen Map of Southwestern Wisconsin," *Prologue: The Journal of the National Archives* 1 (1969), 9-21: 19.
6. The report, with some of the illustrations, is now available as a Google Book.