ROCK STARS

David Dale Owen (1807–1860): Frontier Geologist

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David Dale Owen at about 40 years of age from a self-portrait included with the *Report of a Geological Survey of Wisconsin, Iowa, and Minnesota, and Incidentally of a Portion of Nebraska Territory,* published in 1852.

NEW HARMONY

In 1825, Robert Owen, noted Scottish social reformer and philanthropist, collaborated with William Maclure, "Father of American Geology," to establish an experimental utopian community in the United States. Coincidently, the Harmonist Society led by Father Johann Georg Rapp was entertaining potential offers for their self-sufficient town of New Harmony, founded in 1814 along the Wabash River in Posey County, Indiana, USA. After Owen and Maclure purchased the town from the Harmonists in 1825, Maclure recruited many artists, educators, and scientists from Philadelphia to participate in their social experiment, including Virginia Poullard DuPalais (artist), Marie Duclos Fretageot (educator), Charles Alexandre Lesueur (artist and zoologist), Thomas Say (entomologist and conchologist), and Gerard Troost (geologist).

On 8 December 1825, this group began their journey to New Harmony from Pittsburgh, Pennsylvania, USA, navigating down the Ohio River on a keel boat named *Philanthropist*, later referred to as the "Boatload of Knowledge" (Straw and Doss, 2008). Even though the experimental society in New Harmony dissolved by 1828, the community became a beacon for scientific investigations on the frontier. Specifically, geological work endured for more than 50 years in New Harmony, serving as the headquarters for numerous state and federal geological surveys conducted by David Dale Owen and those whom he trained as geologists.

EDUCATION

David Dale Owen was born on 24 June 1807 in Lanarkshire, Scotland, to Anne Caroline Dale and Robert Owen. He was the third youngest of eight children in his family, with six of his siblings surviving infancy: Robert Dale, William, Anne Caroline, Jane Dale, Richard Dale, and Mary. In childhood, Owen was privately tutored at his family's Braxfield House prior to his three years of education under the tutelage of Philipp Emanuel von Fellenberg's school at Hofwyl, Switzerland. While attending the Swiss school, he received instruction in chemistry, geology, and natural history. Owen, along with his brother Richard, returned to Scotland in 1826 to continue their education in the natural sciences under Andrew Ure at the Andersonian Institute at Glasgow (Hendrickson, 1943).

In 1827, Owen, along with his brothers Robert Dale and Richard, sailed to America with their father, Robert Owen, arriving in New York City in January 1828. While in New Harmony, Owen interacted with several competent artists who focused on scientific illustration, such as Virginia Poullard DuPalais, Charles Alexandre Lesueur, and Lucy Sistaire Say. To continue refining his artistic talents, Owen spent a year in New York City in 1830 with his brother, Robert, improving upon his drawing and painting. Through these experiences, Owen became an accomplished artist who drew sketches and drafted illustrations that were reproduced as lithographs or engravings with his publications.

In 1831, Owen traveled to England and studied chemistry and geology at the University of London. Upon his return to the United States in 1833, he began remodeling the Harmonist Shoemaker's Shop in New Harmony to be used as a geological workshop with a lecture hall, laboratory, storage room, and museum. By the early 1830s, New Harmony had gained global notoriety through its association with Charles Alexandre Lesueur, William Maclure, Robert Owen, and Thomas Say.

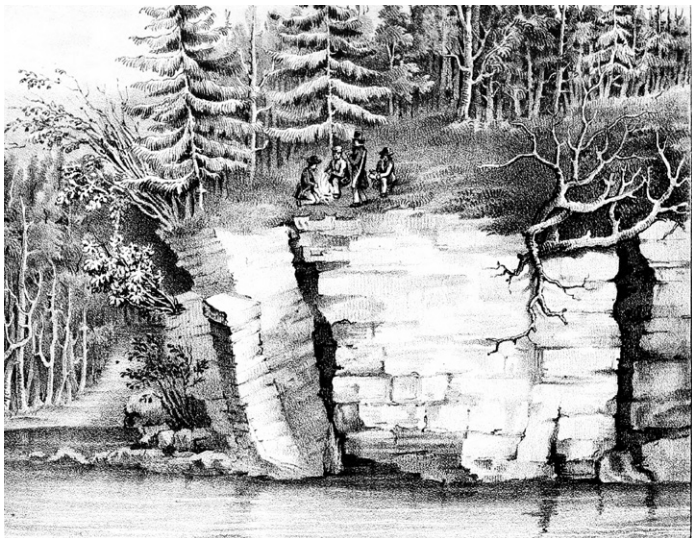
Beginning in 1835, Owen studied anatomy, chemistry, and osteology at the Ohio Medical College in Cincinnati, earning a medical degree in 1836. He also continued to improve upon his sketching, especially in regards to anatomy. Although he never established a medical practice, he used these skills to describe and illustrate fossils, reconstruct vertebrate skeletons, and conduct geological investigations.

EARLY CAREER

Owen acquired his first professional experience as a geologist at age 29 by assisting Gerard Troost with a geological survey of Tennessee. Through this work, Owen gained valuable experience in conducting geological surveys, understanding the significance of fossils in determining the age of sedimentary rocks, and documenting the extent and grade of mineralogical and coal resources. He also conducted chemical analyses on mineral, ore, and rock samples to determine their elemental composition.

Afterward, Owen returned to New Harmony, and in March 1837, the Indiana General Assembly commissioned him to conduct a geological survey of Indiana. During the first year, Owen focused on the building stone and coal and chemical analyses, distribution, and physical properties of minerals and rocks. In March 1838, Owen was reappointed as geologist for Indiana and continued to gain valuable field experiences. From his previous work in 1837, he proposed the further study of ironstones, extent and access to coal resources, the occurrence and quality of brine wells used for salt production, and the origin of native copper in Indiana. Through this work, Owen emphasized the practical application of geology to the discovery and evaluation of natural resources.

At 32 years of age, Owen was appointed as a U.S. geologist by Congress in July 1839 to conduct a survey of Iowa, Wisconsin, and northern Illinois. He assembled a team to discharge the survey, calling upon the assistance of John Locke and Ebenezer Phillips. The geological report summarizing his work was published as U.S. House Executive Document No. 239 on 2 April 1840. A follow-up report that included 25 plates of hand-drawn illustrations and maps was published as Senate Executive Document No. 407 on 11 July 1844. This latter report showcased Owen's artistic talents of sketching landscapes and fossils, as well as establishing a systematic way to summarize a geological survey.



Cliff Limestone (aka Galena Limestone, Ordovician) along the Upper Iowa River, sketched by David Dale Owen and included as a lithograph (Plate V) with Senate Executive Document No. 407, published in 1844.

The federal geological survey conducted by Owen quickly gained fame, and the town of New Harmony was visited by several famous geologists of the time. In the spring of 1841, James Hall joined Owen on a float trip down the Ohio River to collect fossils from Louisville to New Harmony. A few years later, in 1846, Charles and Mary Lyell were guests at the Owen home for several days in New Harmony (Hendrickson, 1943). While visiting, Lyell spent time examining fossil and mineral specimens in Owen's cabinets, along with participating in several field trips to examine Pleistocene loess deposits and sedimentary rocks of the Late Pennsylvanian Bond Formation near New Harmony.

In 1846, his eldest brother and U.S. Congressman Robert Dale Owen requested assistance from David Dale Owen on the design and recommendations of suitable building materials for constructing the new home of the Smithsonian Institution. Owen proposed the distinctive red-brown Seneca Creek Sandstone as the building material for the Smithsonian, which came to fruition with the completion of the Smithsonian castle in 1855.

LEGACY

In 1847, Owen was once again appointed by the U.S. Congress to expand his geological investigation of the mineral lands of Illinois, Iowa, and Wisconsin to include Minnesota and parts of Nebraska. He assembled a team of geologists to conduct this work under his supervision, including John Evans, Fielding B. Meek, Joseph G. Norwood, Richard Owen, Benjamin Shumard, Charles Whittlesey, and Amos H. Worthen. For this work, Owen trained and educated most of these geologists in New Harmony, who later led state and federal surveys of their own.

In 1852, the report generated by Owen standardized the format for federal geologic reports, including the narrative, maps, plates, and illustrations. This report also used several new reproduction techniques, including metal-ruled on steel and Daguerreotypes to illustrate fossils. Ultimately, this work provided a foundation for the forthcoming railroad surveys of the western United States in the 1860s and 1870s and the establishment of the U.S. Geological Survey in 1879.

After his role as U.S. geologist ended in 1854, Owen assumed the role of state geologist of Kentucky from 1854 to 1857; state geologist of Arkansas from 1857 to 1859; and returned as Indiana state geologist from 1859 to 1860. In October 1860, Owen was diagnosed with acute rheumatism and was confined to his sleeping chamber. Instead of resting, Owen continued toward completion of his second geological report of Arkansas. To accomplish this task, he dictated to two persons from his bedside. His colleagues claimed that he worked himself to death by 53 years of age, passing away on 13 November 1860 (Hendrickson, 1943).

Owen was buried next to Thomas Say in the Maclure vault near his home and laboratory in New Harmony. In the 1890s, his remains were moved to Maple Hill Cemetery and marked with a large granite monument with the appropriate epithet "David Dale Owen, Geologist." Undoubtedly, his geologic studies were paramount to the westward expansion of the United States in the early to middle nineteenth century, and his legacy of geological surveys was continued by his numerous contemporaries and apprentices.

REFERENCES

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