

DOUGLASS HOUGHTON – PIONEER OF LAKE SUPERIOR GEOLOGY

by

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**Douglass Houghton – Life Sized Oil Painting
On exhibit at the A. E. Seaman Mineral Museum
by Alva Bradish in the late 1870's.**



Houghton is shown with his dog Meeme on the shore of Lake Superior at Pictured Rocks. A second original oil painting was purchased by the Michigan House of Representatives in 1879 (Act 135) and is on exhibit at the State Capitol Building,

Foreword

A special tribute to Douglass Houghton written by us was first published by the Michigan Basin Geological Society as a part of "A Geological and Historical Field Trip to the Keweenaw Peninsula for the 2016 dedication of a State historic marker in honor of Douglass Houghton" (Bornhorst and Molloy, 2017a). In this field guide we referred to Douglass Houghton as "Michigan's Pioneer Geologist." Rintala (1954) first labeled Douglass Houghton as "Michigan's Pioneer Geologist." Subsequently, in 2017, our nomination of Douglass Houghton to be honored as "Pioneer of Lake Superior Geology" by the Institute on Lake Superior Geology was approved. Houghton was the first Pioneer of Lake Superior Geology and recognized for his historic contribution to the geology of the Lake Superior region. The citation for this honor (Bornhorst and Molloy, 2017b) was modified with permission from the one first published by the Michigan Basin Geological Society. **This A. E. Seaman Mineral Museum Web Publication 4 is a modified version of Bornhorst and Molloy (2017a and b). Most of the text is identical to the previous publications and is reproduced here with permission from the Michigan Basin Geological Society.** We have added several pictures and have added a section on Douglass Houghton's personal mineral collection that is part of the University of Michigan mineral collection at the A. E. Seaman Mineral Museum under the Michigan Mineral Alliance.

When we prepared the earlier tributes to Douglass Houghton we principally relied on two sources: "Douglass Houghton, Michigan's First State Geologist 1837-1845" by Helen Wallin (2004) and "The making of a mining district: Keweenaw native copper 1500-1870" by David Krause (1992). Wallin provided a detailed "sketch" of Houghton's accomplishments, honors and other interesting facts. Krause provided historic context of Douglass Houghton's impact on Michigan's Keweenaw Peninsula. We will did our best fairly summarize Houghton's contributions and to appropriately credit the source. We selected highlights from Houghton's accomplishments to enlighten the reader about him and to provide context to the life-sized oil painting of him on exhibit at the A. E. Seaman Mineral Museum. The A. E. Seaman Mineral Museum also exhibits specimens from Houghton's personal collection that are held under the Michigan Mineral Alliance.

Douglass Houghton: A Professional Scientist

Douglass Houghton's ancestors settled in Massachusetts in the 1650's, more than 100 years before the American Revolution (Wallin, 2004). Douglass was born in Troy, New York in 1809 of Judge Jacob and Mary Houghton. In 1810 his parents moved with their children some 400 miles into the wilderness to Fredonia, New York (Wallin, 2004). At age 20, in late 1829, Douglass was among the earliest graduates from Rensselaer Scientific School (now Rensselaer Polytechnic Institute) with a B.A. degree in the areas of natural history (including geology) and chemistry. As a result of his exceptional performance in early 1830 he became an assistant professor at Rensselaer. Rensselaer is the oldest technological university in North America, established in 1824 in Troy, New York. Modern geology began with the publications of James Hutton in 1785, hence modern geological studies were still "young" by 1824 when Rensselaer was founded. Rensselaer was the premier educational institution for geology from its founding until the latter

part of the 1800's and as such many prominent American geologists were graduates of Rensselaer (Krause, 1992). Thus, Houghton had recognized credentials as a professional scientist by being a graduate of Rensselaer and his formal scientific education was a key component to his success.

In 1830, the Territorial Governor of Michigan, General Cass, and others, asked Douglass Houghton's mentor at Rensselaer, Professor Eaton, to recommend someone to lecture in Detroit on geology, chemistry, and botany. Even though Douglass Houghton was quite young, he was offered the position and moved to Detroit in 1830. His lectures were such a success that he quickly became a scientific pioneer and an important citizen of Detroit and the Michigan Territory. In 1831, he returned to Fredonia and became a licensed physician leading to accounts of him as Dr. Douglass Houghton although he did not have a formal degree in medicine.

Lake Superior Copper

During the presidency of John Adams (president 1797-1801) the nation became interested in the potential for copper on the south side of Lake Superior and Congress passed a resolution to do an investigation (Krause, 1992). However, the expedition was canceled after Thomas Jefferson succeeded Adams as president (president 1801-1809) and the Lewis and Clark expedition (1804-1806) became a higher priority.

The Territory of Michigan was organized in 1805 and in 1813 President Madison appointed Lewis Cass as territorial governor. By then the reputation of Lake Superior copper had grown to a sufficient level of interest to warrant serious investigation. Secretary of War John Calhoun approved Lewis Cass's request in 1819 for an expedition to assess the potential of Lake Superior copper as the national need for copper was high. Henry Rowe Schoolcraft was selected by Cass to lead an expedition in 1820 with the special goal of seeing the reported "copper rock" on the Ontonagon River – the Ontonagon Boulder. Schoolcraft had no formal university scientific training although he showed promise as a chemist with an interest in rocks and minerals (Krause, 1992). Unfortunately for Schoolcraft, he was between an amateur and professional scientist and lacked credibility of his future colleague Houghton even though he is credited with recognizing, in 1819, the potential of discovering deposits of lead in Missouri. Schoolcraft visited the Ontonagon boulder and heard of reports from native Americans of additional masses of native copper. His reports in 1820-1823 heightened interest in Lake Superior copper although there was disagreement in the scientific community on Schoolcraft's initial opinion that the copper ores were native copper and not copper sulfides or carbonates. This opinion was opposite of conventional geological thinking at that time based on examples from Europe (Krause, 1992). Shortly after his reports, Schoolcraft wavered in his opinions as a result of some reading and subsequently recanted his initial views as other deposits consisting primarily of native copper were not known then. Little did he know that there are still no other similar native copper districts on Earth like the Keweenaw Peninsula.

The ownership of the land and mineral rights delayed additional expeditions until at last Schoolcraft, the Indian agent for the upper lakes, was directed to lead an expedition in 1831 to settle the land issue (Krause, 1992). By 1830, Douglass Houghton was recognized as Michigan's leading geological expert and Schoolcraft asked him to be part of the 1831 expedition. Houghton's subsequent report according to Krause (1992) "represented a major step forward in understanding the nature and structure of the district." While Schoolcraft was uncertain as to the source of the copper boulders, Houghton clearly connected them to the trap-rock bedrock (Krause, 1992). After a second expedition in 1832, politics and competing interests delayed more notable studies of Lake Superior copper. After the second expedition Houghton returned to Detroit and his interest changed from practicing geology to medicine and he started a family. His medical practice quickly enhanced his reputation in Michigan and he was a leader in combating cholera (Wallin, 2004).

Michigan's First State Geologist

Michigan was admitted to Statehood at noon January 26, 1837 after it yielded the Ohio strip of land for the Upper Peninsula with the known potential of a copper district as described by Douglass Houghton in 1831-1832. The new state legislature quickly created the state geological survey on February 23, 1837 (Wallin, 2004). Douglass Houghton was appointed the first State Geologist of Michigan and in 1838 the American Journal of Science published a review commending the new State of Michigan for initiating a survey of the geology of the state by Douglass Houghton, a recognized professional (Krause, 1992). In 1839, Douglass Houghton was offered the presidency of the newly formed University of Michigan but declined and instead accepted the position of Professor (second professor at the University of Michigan) in the fields of geology, mineralogy, and chemistry, becoming the founder of these departments (Wallin, 2004; Krause, 1992). As Michigan's State Geologist, Houghton's geological surveys of 1837 to 1839 were focused on Lower Michigan.

Before beginning his 1840 geological survey, Houghton attended a scientific meeting in Philadelphia, joining the prominent geologists of the day and his attendance was recognized by the attendees (Krause, 1992). Houghton was a founding member of the Association of American Geologists and Naturalists and was later President-elect at the time of his death. The Association of American Geologists and Naturalists today is the American Association for the Advancement of Science which publishes the prestigious professional journal, Science. Houghton's professional stature would soon serve the State of Michigan well.



Douglass Houghton at Eagle River, Michigan in 1840.

**Painting by Robert Thom
commissioned by Michigan Bell
Telephone Company 1964-1967.
Used on Bicentennial post card.**

Houghton's 1840 geological survey focused on the Upper Peninsula (Wallin, 2004). His copper report published in 1841 was his greatest contribution to Michigan geology (Krause, 1992) and triggered the beginning of migration to the Keweenaw Peninsula in search of copper. Houghton's national and Michigan recognition gave credibility and instant recognition to his report. While Schoolcraft previously reported on the existence of copper in the Keweenaw Peninsula a decade earlier, but Schoolcraft did not have the professional credentials, recognition or stature of Houghton.

Douglass Houghton's famous copper report of 1841 ultimately led to discovery of many profitable mines in the Keweenaw Peninsula and production of about 11 billion lbs of refined copper from 1845 to 1968. Houghton's prediction of economic copper deposits was certainly correct! The Keweenaw Peninsula hosts the Earth's largest accumulation of native copper. Unfortunately for many "adventurers," Houghton's fears also came true as there would be more failures than success in the exploration for native copper:

"While I am fully satisfied that the mineral district of our state will prove a source of eternal and steadily increasing wealth to our people, I cannot fail to have before me the fear that it may prove the ruin of hundreds of adventurers, who will visit it with expectations never to be realized. The true resources have as yet been but little examined or developed, and even under the most favorable circumstances, we cannot expect to see this done but by the most judicious and economical expenditure of capital, at those points where the prospects of success are most favorable." (Fuller, 1928)

From 1842 to 1844 Houghton's geological surveys waned due to lack of funding although the rush to the Keweenaw Peninsula was increasing (Krause, 1992). Houghton was elected major of Detroit in 1842 despite being absent and his success at being major led people to consider him as having potential for higher political office (Krause, 1992).

One of the biggest problems in developing the mineral potential of the Keweenaw Peninsula was that there were no boundaries and no existing maps with survey lines (Molloy, 2016). In 1844 Houghton presented a convincing paper at the meeting of the Association of American Geologists and Naturalists in Washington D.C. where he proposed to do land and geologic surveys at the same time. His colleagues were so impressed that they passed a resolution of support. This resolution resulted in the federal government funding Houghton's proposed survey (Krause, 1992). In 1844 Houghton was also lauded by Michigan newspapers for of his personal geological investigations having more impact that any single person in any state (Krause, 1992). By the summer of 1845 the first mining rush in North America to the Keweenaw Peninsula was well underway. Houghton's federal geological survey began in May of 1845. However, in October of 1845, only one month after he turned 36, Douglass Houghton drowned in a boating accident in Lake Superior not far from Eagle River, Michigan.

Houghton struggled to understand the significance of the predominance of native copper pebbles to boulders in glacial deposits and masses of native copper imbedded in surface outcrops in the Keweenaw Peninsula. He believed, consistent with scientific thought of the day that at depth there should be copper sulfides (Krause, 1992). While Schoolcraft initially recognized the significance of native copper he too subsequently struggled just as Houghton did. Unfortunately, Houghton died just before native copper began being produced in significant quantities from the Cliff Mine near Eagle River (Wallin, 2004). The Cliff Mine, the first modern mine in the district and produced 20,000 lbs of copper in 1845, the year of Houghton's tragic death and much more in subsequent years, totaling 38 million lbs of copper (Butler and Burbank, 1929). Schoolcraft lived to see that his initial opinion of the importance of native copper was correct.

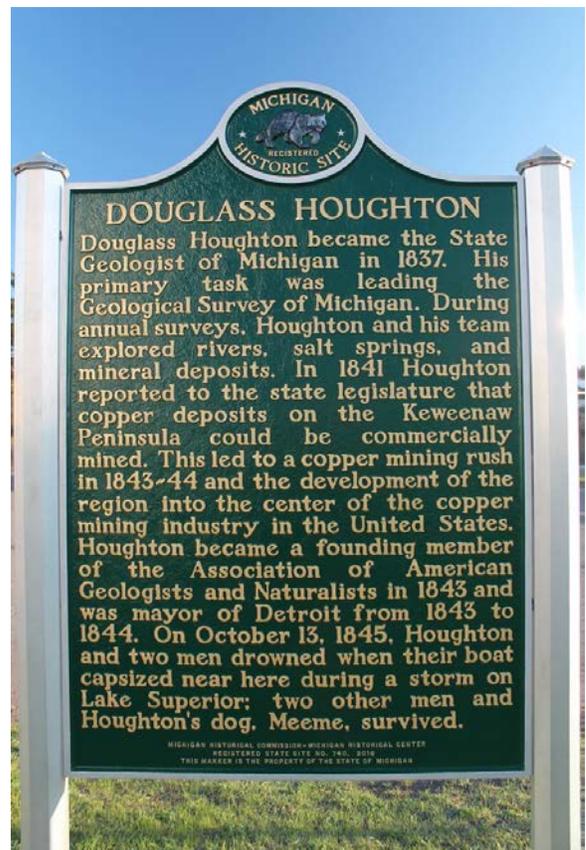
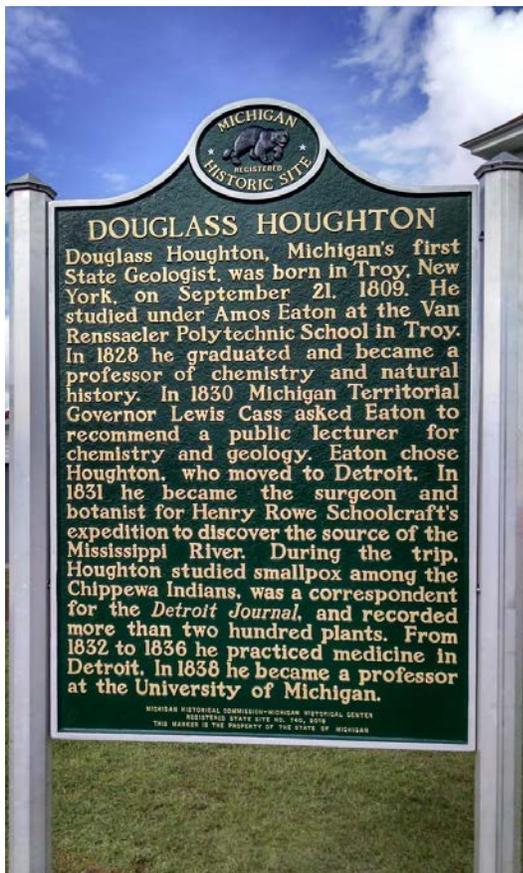
Epilogue



Monument in memory of Douglass Houghton on the west edge Eagle River., Michigan along M-26. The monument was dedicated in 1914 and is currently part of the Keweenaw County Historical Society.

Since his death, Houghton has been honored and recognized in multiple ways (see Wallin, 2004; Krause, 1992). In the Keweenaw Peninsula there are several geographic features named after Houghton such as the City of Houghton, Houghton County, Mount Houghton, and Douglass Houghton Falls. In the lower peninsula of Michigan, Houghton Lake (the largest inland lake in Michigan) is named after him. There are monuments that recognize Houghton such as the stone monument in Eagle River, Michigan pictured above.

Douglass Houghton continues to be recognized such as in Eagle River, Michigan near the historic bridge across Eagle River and adjacent to the former Eagle River School there is an official State of Michigan historic marker which was dedicated September 10, 2016.



State of Michigan Historic Site Marker in Eagle River, Michigan

Douglass Houghton was a nationally-recognized modern professional geologist. He was among early modern geologists of the USA. He was the first official geologist of the newly formed State of Michigan. His geological investigations and copper report in 1841, about 175 years ago, led to the first mining rush in North America to the Keweenaw Peninsula of Michigan in search of riches from mining copper. Ultimately, these mines yielded 13 billion lbs of refined copper from 1845 to 1968. While the native copper mines are now all closed, Houghton's legacy lives on.

Douglass Houghton has been recognized as "Michigan's Pioneer Geologist" (Bornhorst and Molloy, 2017a; Rintala, 1954). The 63rd Annual Institute on Lake Superior Geology recognized Houghton as a "Pioneer of Lake Superior Geology."



**Douglass Houghton
(1809-1845)**

**Oil painting on board by Alva
Bradish 1806-1901**

University of Michigan Douglass Houghton Scholars Program [1]image: [2], Public Domain, <https://commons.wikimedia.org/w/index.php?curid=6666069>

Douglass Houghton's Mineral Collection

In 1838 at the urging of Henry Rowe Schoolcraft, at one of its first meetings the University of Michigan Board of Regents purchased a collection of mineral specimens from Austrian Baron Louis Lederer's, hence began the University of Michigan mineral Collection (Stefano et al, 2013). Douglass Houghton was the University of Michigan's second Professor in 1839 and he was chair of the geology and mineralogy department. Houghton prepared an exhibit of Lederer and other specimens. The University of Michigan purchased Douglass Houghton's personal mineral collection for addition to the University of Michigan mineral collection after his death (Stefano et al., 2013). In 2015, the University of Michigan mineral collection was relocated at the A. E. Seaman Mineral Museum of Michigan Tech under the Michigan Mineral Alliance. Thus,

what remains of Douglass Houghton's personal mineral collection now resides in Houghton, Michigan.

There are 52 specimens attributed to Houghton in the University of Michigan mineral collection. Some of them were personally collected by Houghton while others were not. It is unlikely a specimen from Switzerland was collected by Houghton. Those specimens from the vicinity of Lake Superior were likely collected by him as were others in New York, Massachusetts, Vermont, and New Jersey as Douglass Houghton was on several expeditions in the Lake Superior region, lived and was a student in New York, and attended geological meetings on the east coast of the U.S. It is uncertain whether those specimens from Maryland, Virginia, Iowa, and Illinois, and Ohio were collected by him or otherwise obtained for his collection. Perhaps the most interesting of Houghton's specimens is an irregular mass of native copper that was likely chiseled from the Ontonagon Boulder during one of Houghton's expeditions to the Keweenaw Peninsula. By today's standards almost all of Houghton's specimens are low-quality. They are historically significant. The A. E. Seaman Mineral Museum exhibits a few of Douglass Houghton's mineral specimens.

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