



Against the Odds: Edward Hitchcock and the Vermont Geological Survey

After nearly a quarter century of unforeseen delays, Vermont at last had its geological survey, one that mapped and described the state's substantial mineral wealth in great detail, one that helped instill in its citizenry a sense of pride in the richness of their state. And one that would forever link Vermont with one of nineteenth-century America's most eminent scientists.

By ROBERT T. McMASTER

In March 1857 newly elected Vermont Governor Ryland Fletcher took up a cause that had become something of an albatross for his seven predecessors. He announced the appointment of Edward Hitchcock, retired professor of geology at Amherst College in Massachusetts, as state geologist of Vermont. Hitchcock's assignment: to carry out a geological survey of the Green Mountain State. No fewer than twenty other states had commissioned similar surveys since 1830 with the goal of identifying untapped mineral resources.

Governor Fletcher and the state legislature may well have wondered at the time if some kind of curse had been placed on the Vermont project. For more than a decade and a half they had been striving to see that

.....
ROBERT T. McMASTER is a retired professor of biology at Holyoke Community College, Holyoke, Massachusetts. In 2021 he published the first-ever biography of Edward Hitchcock, *All the Light Here Comes from Above: The Life and Legacy of Edward Hitchcock*.

Vermont History Vol. 91, No. 2 (Summer/Fall 2023): 103–109.

© 2023 by the Vermont Historical Society. ISSN: 0042-4161; on-line ISSN: 1544-3043

.....

survey to completion, but again and again fate had intervened. Some may well have feared that naming Edward Hitchcock to take up the work would prove to be a death knell both for Hitchcock and for the Vermont Geological Survey.

The Vermont legislature first considered the idea of a state geological survey in 1836. But eight years passed before the project received approval and funds were appropriated.¹ Finally, in 1844, Governor William Slade appointed Edward Hitchcock to the post. Hitchcock at first indicated he would accept the appointment. But only a few days later he was named president of Amherst College and was forced to withdraw, the first of many setbacks for the project.

On Hitchcock's recommendation, Governor Slade appointed Charles B. Adams, an Amherst colleague, as state geologist. Professor Adams labored at the survey for close to eight years. He died in 1853, however, leaving volumes of notes as well as a collection of more than 7,000 rock and mineral specimens, but without completing a report.

Vermont native Zadock Thompson was the next to receive the call. A highly regarded geologist with decades of experience in the Green Mountain State, Thompson immediately put himself to the task, only to perish just three years into the project.

The mantle then passed to Augustus Young of St. Albans. But Young met a similar fate only a few months into his tenure.

As if three deaths were not sufficient to put an end to the survey, in January 1857 a fire at the State House in Montpelier destroyed Adams's mineral collection. No doubt some in Vermont wondered whether there might be a message in all these reversals—perhaps the Vermont Geological Survey was simply not meant to be.

With the appointment of Edward Hitchcock as the fourth state geologist, Governor Fletcher might have been accused of throwing good money after bad. Not that Hitchcock was unqualified. In terms of expertise and experience he was arguably the most capable candidate they could hope to find for the job, having earned renown as a geologist, paleontologist, and college president. From 1830 to 1833 Hitchcock had carried out a similar survey of Massachusetts, the first of its kind in the nation.² His report received wide acclaim from scientists and soon became a model that nearly two dozen other states followed. In 1841 Hitchcock had been one of the first American scientists to embrace Louis Agassiz's theory of continental glaciation. And the Amherst professor's research on the "fossil footmarks" of the Connecticut Valley was nothing short of revolutionary, making him the first scientist to find evidence of dinosaurs in North America.³

Edward Hitchcock, steel engraving from William S. Tyler, A History of Amherst College (New York: Frederick H. Hitchcock, 1895), 116.



With such credentials, why might the appointment of Edward Hitchcock have been considered a risky move for the Vermont governor? At the time of his appointment Hitchcock was sixty-three years of age and in frail health.

His personal notes reveal his own deep misgivings about his constitution and fears that he would soon be in the grave. Furthermore, anyone acquainted with the man would have known that he suffered from a “desponding nature.”

Edward Hitchcock was a deeply religious man, one who believed that God watched over him, had plans for his life, and would terminate it whenever He saw fit. When Hitchcock received Governor Fletcher’s letter, he was all too aware of the tragic story of the Vermont Geological Survey. As he wrote in October 1857:

The history of the Geological Survey of Vermont is a melancholy one. Since it has commenced twelve years ago, no less than three distinguished naturalists who have had charge of it have been called into eternity. And when I find myself in advanced life and full of infirmities occupying their place, is it superstition or reasonable apprehension, that makes me sometimes feel that a fourth individual may have the same summons before the survey is completed?⁴

Despite his worries and fears, Edward Hitchcock was possessed of a driving ambition. Even in his later years, he savored new projects and threw himself into each with every ounce of strength he could muster. His hypochondria and anticipation of his own demise, far from hobbling him, only drove him forward more forcefully, convincing him that he must complete the work God had planned for him while he still had the ability.⁵

Hitchcock promptly accepted Governor Fletcher’s appointment. But the scope of the survey was daunting. Vermont is nearly as large in area as Massachusetts but with far more rugged terrain. To Hitchcock’s credit, he quickly decided that he needed assistance in the undertaking. So he conscripted his two sons, Edward Jr. and Charles H. Hitchcock,

aged twenty-nine and twenty-one respectively, both of whom had considerable geological field experience, to work alongside him alternately. Then, just days before the planned departure, he added a fourth member to his team, forty-year-old Albert D. Hager. A native of Chester, Vermont, Hager had wide knowledge of and experience with the state's geology and would prove to be an invaluable team member.

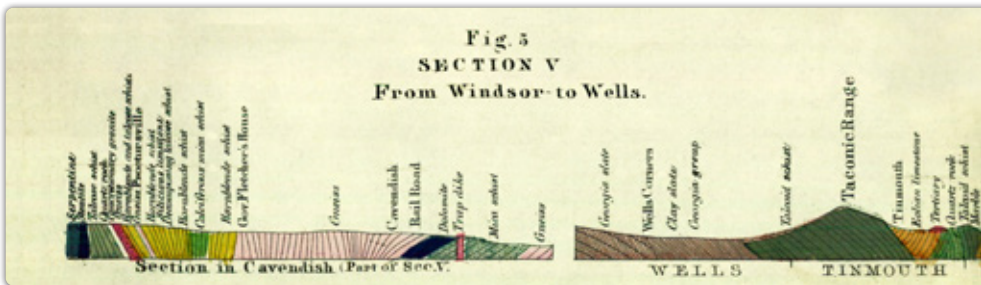
In early May 1857, barely a month after his appointment, Edward Hitchcock set out with Charles Hitchcock and Albert Hager on the first field season of the Vermont Geological Survey. The plan was to establish thirteen transects across the state, follow each, keep careful notes, record data on the orientation of strata, and eventually draw cross sections of each transect. He also planned to collect rock and mineral specimens along the way and deposit them in the state archives upon the completion of the project; in fact, he had already been promised a room in the new State House for that purpose.

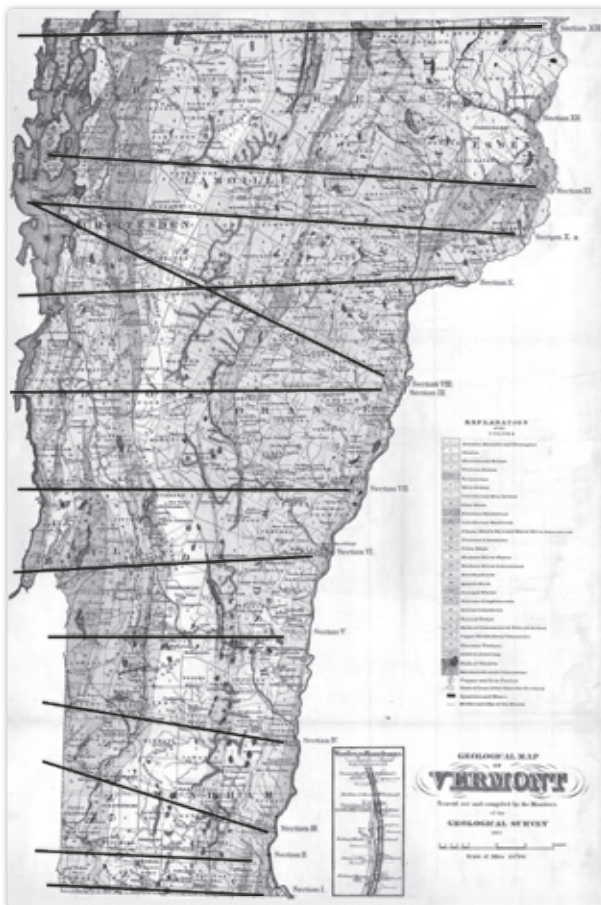
But the survey did not have an auspicious start. Bad weather descended upon the party as they labored along the first transect from Brattleboro to Pownal. "I have got completely upset by my jaunt last week," Hitchcock wrote Edward Jr. on May 23. "I never had so hard a time of it—and am still quite unwell. The worst symptom is an irregular action of the heart. I rode two days all day in rain and snow."⁶

The very next day, May 24, 1857, he made this entry in his notes:

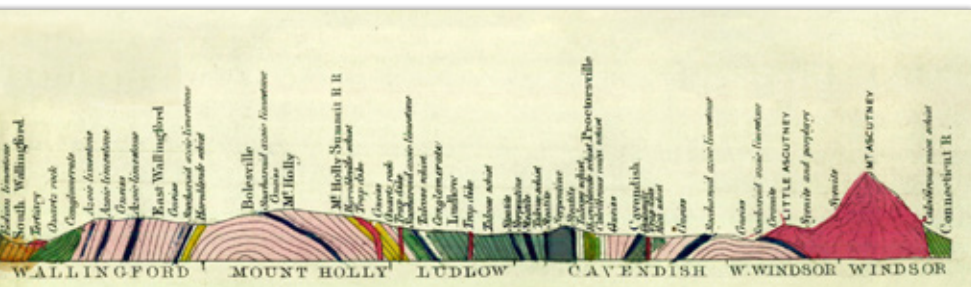
This is my sixty fourth birthday. And though every thing around me is bursting into life at this delightful vernal season yet it becomes me to turn my thoughts forward to death and eternity especially as the present state of my health reads to me an impressive lecture on my frailty and liability to be suddenly removed. In consequence of an extremely hard journey in Vermont and exposure to storms I have developed anew a difficulty in my heart of which I have formerly spoken in this journal.⁷

Cross section V from Hitchcock, et al., Report on the Geology of Vermont (Claremont, NH: Claremont Manufacturing, 1861). Image courtesy of Vermont Department of Environmental Conservation.





Geological map of Vermont from Hitchcock, et al., Report on the Geology of Vermont (Claremont, NH: Claremont Manufacturing, 1861). Image courtesy of Vermont Department of Environmental Conservation.



Exhausted and discouraged, Edward Sr. returned to Amherst, leaving his assistants to continue the survey. The three younger men carried on ably. Over the next three years they traveled all thirteen transects, recording volumes of data and collecting over 3,000 rock and mineral specimens. Edward Sr. remained in Amherst, busying himself with several other projects. But when the time came to produce the final report, he labored on it for nearly a year, taking the work of his sons and Albert Hager and combining it with his own insights. Hager toiled for months with a printer assembling the text, woodcuts, and lithographs into the completed report that was submitted to Governor Fletcher in October 1860.⁸

Hitchcock's *Report on the Geology of Vermont* was a massive work. It filled two volumes, ran to 982 pages, 650,000 words, and included some 364 illustrations—woodcuts as well as many colored plates. In that report Hitchcock and his assistants made important contributions in the fields of economic geology, glacial geology, and metamorphism, as well as the long-standing debate about the history of the Taconic Range.⁹

Elkanah Billings of the Geological Survey of Canada, writing in the *American Journal of Science and Arts* in 1862, described the report as “one of the best that has been published on this continent.”¹⁰ Vermont historian and archivist T. D. Seymour Bassett, wrote in 1976, “[Hitchcock's] *Geology of Vermont* with its maps, plates, woodcuts, and text, was a milestone. For the first four state geologists it was a monument.”¹¹

Unlike his three predecessors, Edward Hitchcock had defied the odds, surviving despite advanced age and poor health. In many ways it was the capstone of his geological career, further securing his preeminence in the field of state-sponsored geological surveys.

One personal benefit for Edward Hitchcock pertains to his younger son, Charles H. Hitchcock. Charles had been contemplating a career in the ministry, but after completing the Vermont survey and report, the twenty-five-year-old's vocational choice had been made. He was hired to carry out similar surveys in New Hampshire and Maine. He would eventually accept a faculty position in geology at Dartmouth that he would hold for forty years. Albert D. Hager's experience with the Vermont Geological Survey also served him well. He was appointed state geologist of Vermont following Hitchcock, holding that position from 1862 to 1870.

Finally, it seems, Vermont had thrown off that curse that seemed to hang over the entire enterprise. After nearly a quarter century, it at last had its geological survey, one that mapped and described the state's sub-

stantial mineral wealth in great detail, one that helped instill in its citizenry a sense of pride in the richness of their state. And one that would forever link Vermont with one of nineteenth-century America's most eminent scientists.

NOTES

¹ *Laws of Vermont, 1844*, No. 9, "An act to provide for a geological survey of the State," approved 28 October 1844.

² Edward Hitchcock, *Report on the Geology, Mineralogy, Botany, and Zoology of Massachusetts* (Amherst, MA: J. S. and C. Adams, 1833).

³ Edward Hitchcock, "Ornithichnology—Description of the Foot marks of Birds, (Ornithichnites) on new Red Sandstone in Massachusetts," *American Journal of Science and Arts* 29 (1836): 307–40.

⁴ Edward Hitchcock, "Report on the Geological Survey to His Excellency Ryland Fletcher, Governor of Vermont," *Vermont Chronicle* (Bellows Falls), 27 October 1857.

⁵ Hitchcock published fifty books and more than 160 articles in the scholarly journals of his day. In addition to the Massachusetts survey, his major works include *Elementary Geology* (New York: Ivison and Phinney, 1840, and more than twenty subsequent editions from 1840 to 1862), *The Religion of Geology and Its Connected Sciences* (London: James Blackwood and Company, 1851), and *Ichnology of New England* (Boston: William White, 1858).

⁶ Letters of Edward Hitchcock Jr., Edward and Mary Judson Hitchcock Family Papers, Amherst College Archives and Special Collections, Series 3-A, Box 8, Folder 20, letter dated 23 May 1857.

⁷ Private Notes of Edward Hitchcock (3 vols.), 1828–1864, Edward and Orra White Hitchcock Papers, Amherst College Archives and Special Collections, Box 19, Folders 3–5, entry dated 24 May 1857.

⁸ "In *Vermont's Land and Resources* (Shelburne, VT: New England Press, 1986), author Harold A. Meeks writes, "The report actually was done under the direction of Mr. Albert D. Hager who compiled the many reports, probably did the editing, and saw to the publishing of the work. Hager also wrote much of the material, although his name is seldom mentioned" (76). In fact Edward Hitchcock Sr. directed the project from the outset with Hager and Charles H. Hitchcock working together in the field. The writing and editing of the final report were largely accomplished by the Hitchcocks. Hager did oversee the printing of the report, for which Hitchcock gave him credit and praise in the opening "Note."

⁹ Edward Hitchcock, Edward Hitchcock Jr., Albert D. Hager, Charles H. Hitchcock, *Report on the Geology of Vermont: Descriptive, Theoretical, Economical, and Sceneographical*, 2 vols. (Claremont, NH: Claremont Manufacturing Co., 1861; Cecil J. Schneer, "The Great Taconic Controversy," *Isis* 69 (2) (June 1978), 173–191.

¹⁰ Elkanah Billings, "Review of Report on the Geology of Vermont by Edward Hitchcock et al.," *American Journal of Science and Arts*, 2nd ser., 33 (1862): 416–420.

¹¹ Thomas D. Seymour Bassett, *A History of the Vermont Geological Surveys and State Geologists* (Montpelier: Vermont Geological Survey, 1976), 11.